Hywind Scotland Pilot Park Project
Plan for Construction Activities 2017

Title:
Hywind Scotland Pilot Park Project # Plan for Construction Activities 2017

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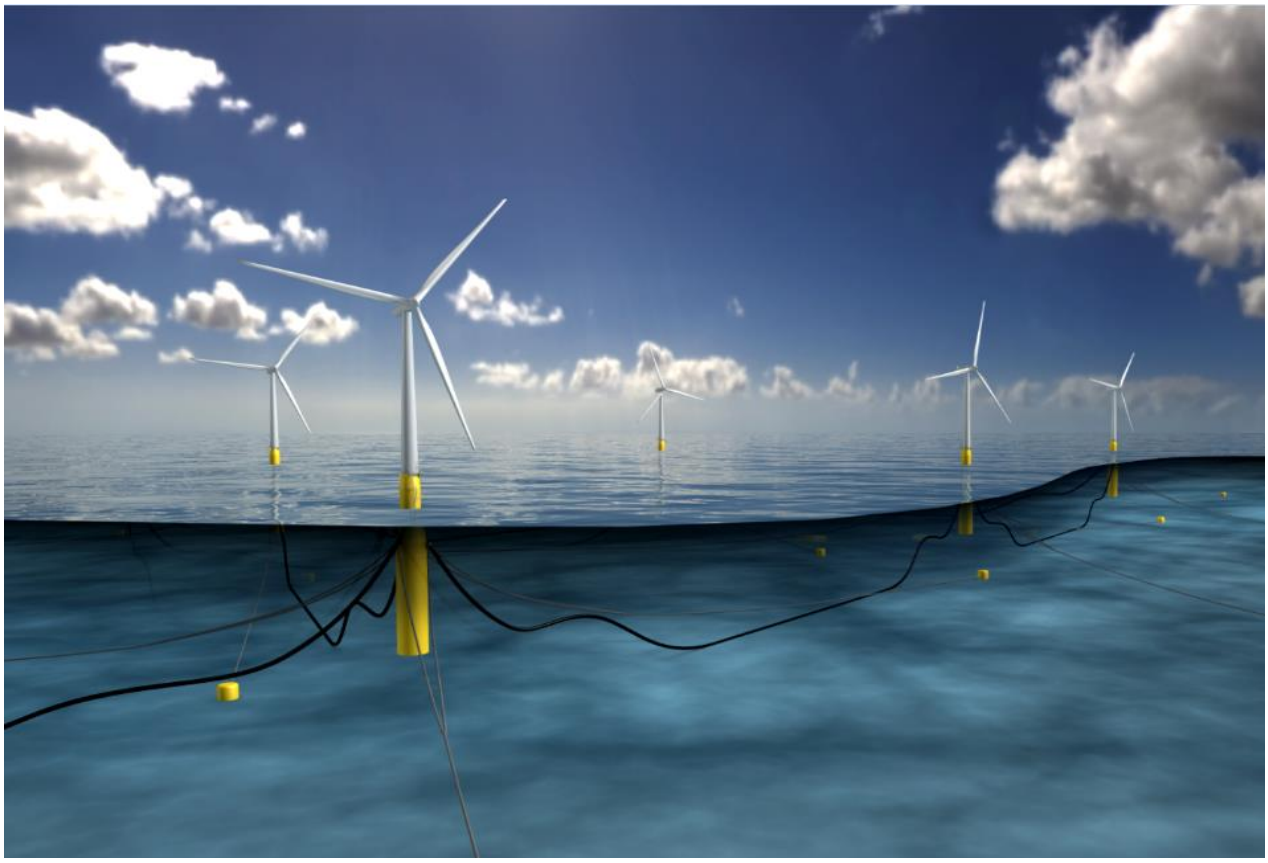
1 Introduction

Statoil ASA received a Marine Licence on the 30th October 2015 to develop the Hywind Scotland Pilot Park Project ("Hywind Scotland"). Five floating wind turbines (FWTs) will be installed, each with a generating capacity of 6 MW giving a total generating capacity of 30 MW, approximately 25 km off the coast of Peterhead. Each turbine will be anchored by a three-point mooring spread, and they will be connected by inter-array cables (figure 1.1). An export cable will transport the generated electricity to the shore. The application, Marine Licence decision documents and other documentation are placed on Marine Scotland's web page[1].

An horizontal directional drilling (HDD) solution was selected for the cable landfall. The HDD activities, including the installation of a duct in the borehole for later pull in of the export cable, was completed in September 2016, whereas the rest of the offshore installation works will be carried out in 2017.

Figure 1.1. Graphical illustration of the Hywind Scotland Pilot Park Project



[1] http://www.gov.scot/Topics/marine/Licensing/marine/scoping/Hywind

A separate HDD plan, covering the marine activities in 2016, was developed by Statoil, and Marine Scotland approved this as sufficient for partly discharging the Licence conditions for these activities. For the remaining offshore construction activities to be performed in 2017, Statoil has agreed with Marine Scotland to develop a construction plan, covering the relevant licence conditions in one document, rather than preparing separate documents or plans for each condition. The issues covered are listed below, where appropriate with reference to the relevant conditions to be discharged:

- Development Specification and Layout Plan - DSLP (Technical description), ref. condition 3.2.2.6;
- Lighting and Marking Plan – LMP, ref. condition 3.2.2.11;
- Construction Method Statement – CMS, ref. condition 3.2.2.5;
- Cable Plan – CaP, ref. condition 3.2.2.10 a, b, d, e and h;
- Vessel Management Plan – VMP, ref. condition 3.2.2.7;
- Construction Programme - CoP (Schedule), ref. condition 3.2.2.4;
- Baseline description, ref. condition 3.2.2.10 b and c;
- Environmental Management Plan – EMP, ref. condition 3.2.1.2, including chemical usage (ref. condition 3.1.7) and environmental protection (condition 3.1.8);
- Fisheries Management and Mitigation Strategy – FMMS, ref. condition 3.2.1.3;
- Emergency Response Co-operation Plans – ERCoP (including emergency response and HSE incidents reporting (brief description, conditions 3.2.1.7 and 3.2.1.10 to be discharged through separate documents);
- Navigational Safety Plan – NSP, ref. condition 3.2.2.8;
- Marine Archaeology Reporting Protocol – MARP, ref. condition 3.2.2.19;

Five additional plans will be prepared to discharge the remaining license conditions. Statoil has agreed with the Maritime and Coastguard Agency (MCA to prepare two Emergency Response and Co-operation Plans (ERCoPs) following a standard template; one for the construction phase and one for the operational phase. Emergency response and reporting of health and safety incidents (ref conditions 3.2.1.7 and 3.2.1.10) is therefore only briefly covered in this construction plan. Furthermore, separate plans will be developed for environmental monitoring (ref. condition 3.2.1.1, 3.2.1.4, 3.2.1.5 and 3.2.1.6) and for operation and maintenance (ref. condition 3.2.2.9), as these covers activities beyond the construction phase. A Decommissioning Programme (ref. condition 3.2.2.3) has already been issued for consultation, and will be updated as necessary.

2 Development Specification and Layout Plan - DSLP

The Hywind Scotland Pilot Park is to be located approximately 25 km off the coast at Peterhead, North East Scotland just outside the 12 nm territorial water limit. The Project is located in the Buchan Deep and is characterised by water depths ranging between 98 m and 117 m, becoming deeper from

north to south. The seabed within the turbine deployment area comprises silty sand and gravel, overlain with scattered boulders. This same seabed type extends west along the deeper offshore end of the export cable corridor, although boulders become more frequent towards the coast. Further information on the baseline condition is given in section 8 of this document, with references to the relevant parts of the Environmental Statement.

The Development will involve the installation of five 6 MW floating wind turbine generator units and is expected to produce up to 135 GWh per year of electricity. The turbines will have a hub (centre) height of 97,8 m above sea level and a height to tip of rotor blade of 175 m, with a draught of 78 m and a rotor diameter of 154 m. An illustration of the size of a Hywind floating wind turbine (FWT) is shown in figure 2.1. Because the turbines are floating, these distances will be more or less constant and independent of the tidal cycles. The orientation of the rotor will vary depending on the wind direction, but as the prevailing wind will be from a southerly direction (ref. the ES document page 8-8), the orientation will predominantly be towards south, more or less perpendicular to the coast.

The position of each turbine is shown on the map in figure 2.2, and details on the exact positions are given in table 2.1. The turbines will be installed 1386 m apart, and will be attached to the seabed by a three-point mooring spread and anchoring system. Three suction anchors will be installed per turbine, and the mooring line lengths will vary between 691m and 875 m from turbine nominal centre. The position of each anchor and the length of each mooring line is given in table 2.2. The exact position of each turbine may deviate up to 28 m due from the given position to variation in wind and current conditions.

Colouring of the turbines will be in accordance with IALA (International Association of Lighthouse Authorities) recommendations:

Substructure to elevation 15 m	RAL 1003 (Signal yellow)
WTG Tower from elevation 15 m	RAL 9016 (Traffic white)
Nacelle	RAL 7035 (light Grey)
Blades	RAL 7035 (light Grey)
Boat Landings and Ladders	RAL 9016 (Traffic white)

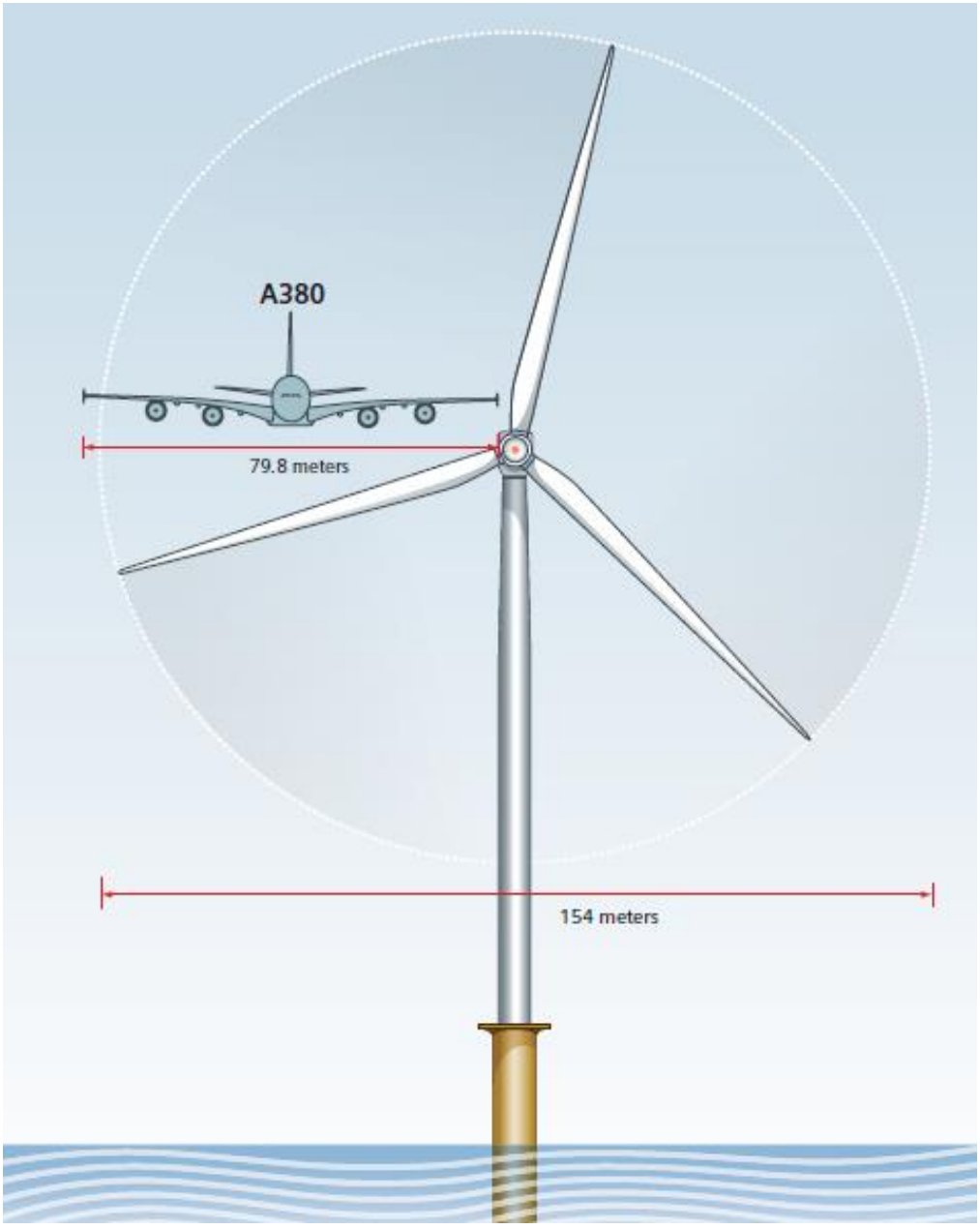


Figure 2.1. Illustration of the size of a Hywind floating wind turbine unit

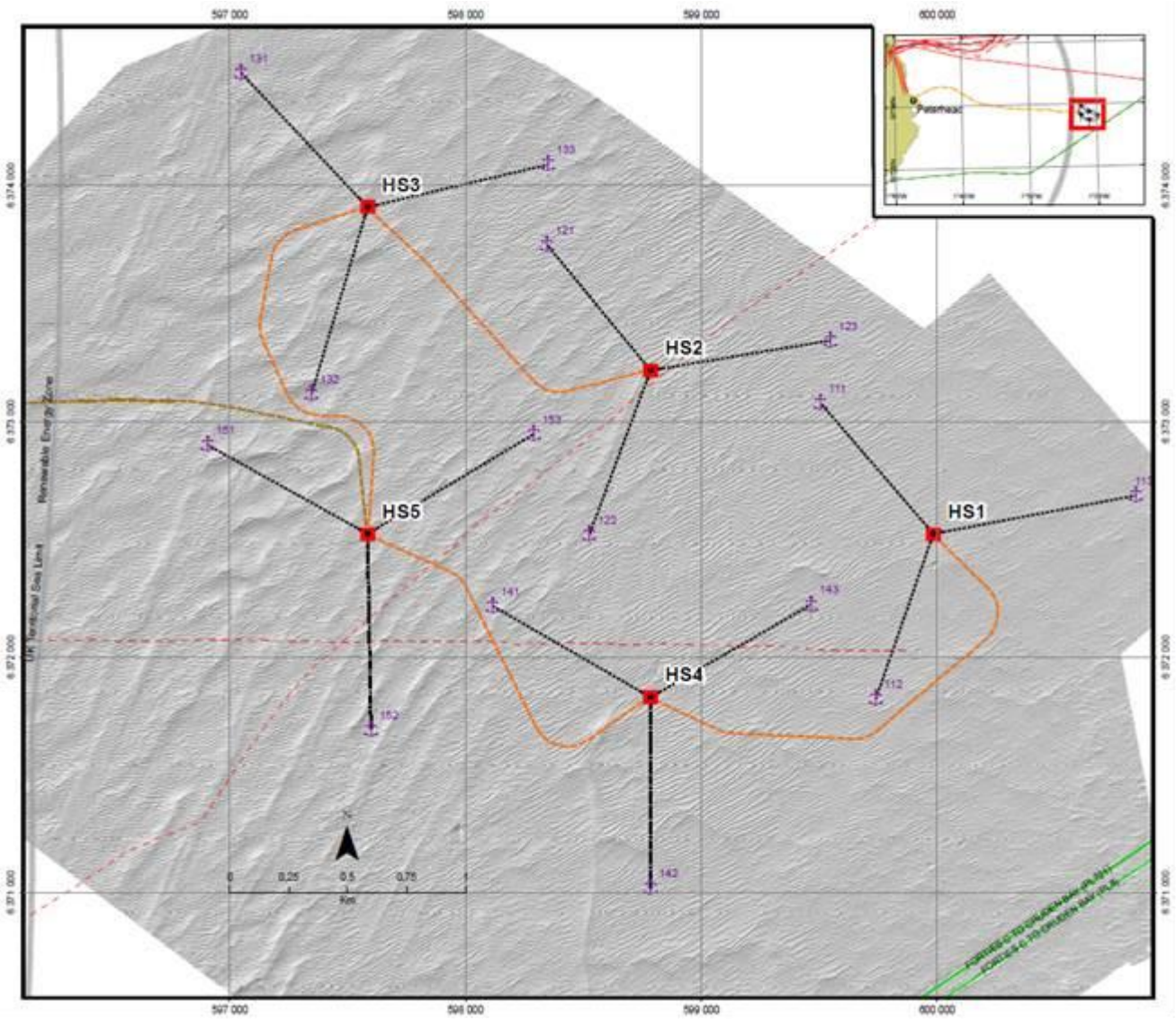


Figure 2.2. Map showing the location of the floating wind turbines (FWT units), the anchor spreads and the cables.

Table 2.1. Locations for each floating wind turbine (FWT) given as longitude and latitude (Datum WGS84) in column 2 and 3 and as UTM coordinates (Projection UTM z30N) in column 4 and 5.

FWT	Longitude	Latitude	Easting	Northing
HS1	1° 19,937' W	57° 29,056' N	599 985	6 372 522
HS2	1° 21,120' W	57° 29,445' N	598 785	6 373 215
HS3	1° 22,305' W	57° 29,834' N	597 584	6 373 908
HS4	1° 21,154' W	57° 28,699' N	598 785	6 371 829
HS5	1° 22,338' W	57° 29,088' N	597 584	6 372 522

Table 2.2. Anchor position and water depth for the three anchors of each turbine and the length of each mooring line. Positions are given as longitude and latitude (Datum WGS84) in column 3 and 4 and as UTM coordinates (Projection UTM z30N) in column 5 and 6.

FWT	Anchor number	Longitude	Latitude	Easting	Northing	Depth	Mooring line length
HS1	111	1° 20,402' W	57° 29,362' N	599 506	6 373 077	112 m	733 m
	112	1° 20,198' W	57° 28,683' N	599 741	6 371 823	114 m	740 m
	113	1° 19,072' W	57° 29,133' N	600 845	6 372 685	117 m	875 m
HS2	121	1° 21,547' W	57° 29,738' N	598 346	6 373 748	106 m	691 m
	122	1° 21,397' W	57° 29,074' N	598 525	6 372 519	108 m	743 m
	123	1° 20,353' W	57° 29,504' N	599 549	6 373 343	111 m	775 m
HS3	131	1° 22,829' W	57° 30,148' N	597 047	6 374 478	100 m	783 m
	132	1° 22,561' W	57° 29,412' N	597 347	6 373 118	104 m	825 m
	133	1° 21,534' W	57° 29,922' N	598 350	6 374 089	106 m	787 m
HS4	141	1° 21,815' W	57° 28,916' N	598 115	6 372 216	106 m	774 m
	142	1° 21,174' W	57° 28,263' N	598 785	6 371 020	111 m	809 m
	143	1° 20,462' W	57° 28,902' N	599 467	6 372 223	113 m	788 m
HS5	151	1° 23,009' W	57° 29,299' N	596 905	6 372 899	102 m	777 m
	152	1° 22,343' W	57° 28,639' N	597 599	6 371 690	105 m	832 m
	153	1° 21,622' W	57° 29,307' N	598 290	6 372 946	107 m	824 m

Each suction anchor will have a height of 15.9 m and a diameter of 5 m. After being installed the suction anchor top will reach 1 to 1.5 m above the seabed. Installation aids on top of the anchors will add a height of 1.7 m to the structures. Figure 2.3 shows pictures and drawing of the anchors.

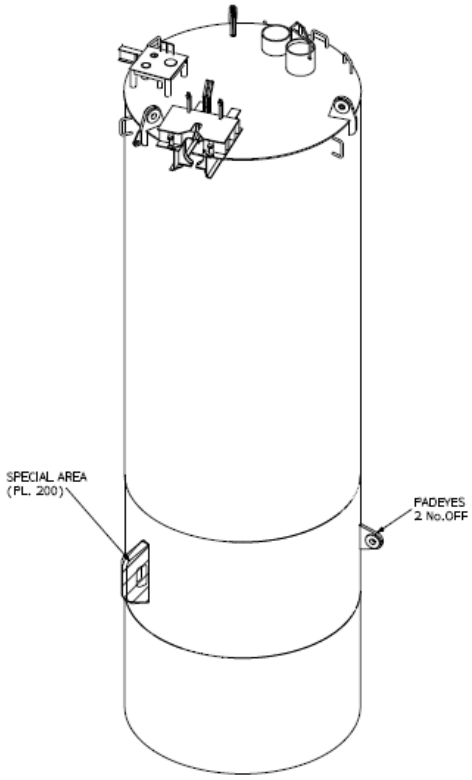


Figure 2.3. Pictures and drawing of suction anchors

The mooring arrangement is shown in figure 2.4. The upper part of the mooring chains consists of a double set of 132 mm bridle chains connected to the main mooring chain via a tri-plate. The main mooring line (top, mid and bottom chain) is a 147 mm chain where each chain link has a length of 882 mm and weigh 255 kg.

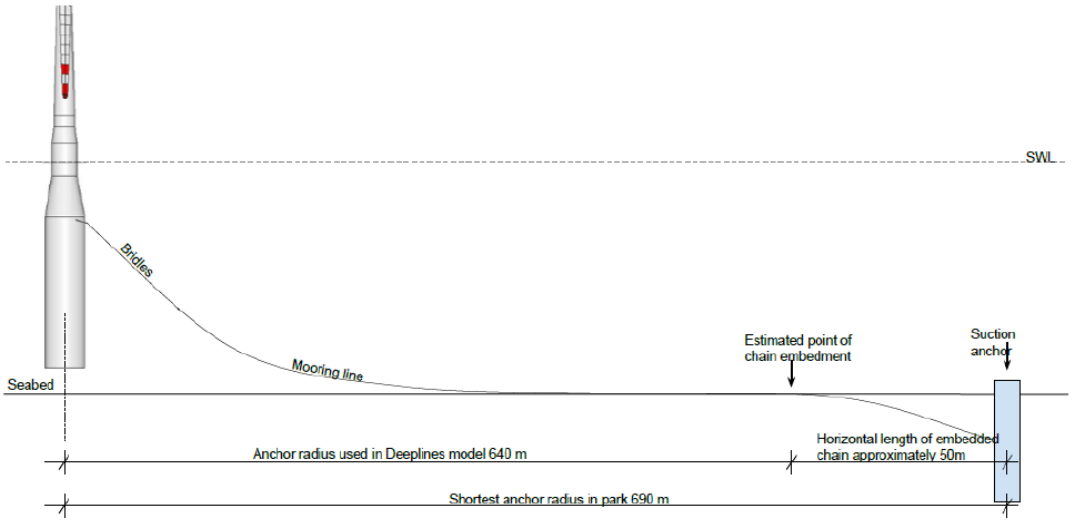


Figure 2.4. General overview of the mooring arrangements for the floating wind turbines (FWTs)
The turbines will be connected by inter-array cables, which may require stabilisation by rock dumping in some locations. Further details on the cable arrangements are given in chapter 5, but an overview cable lengths are given in table 2.3. The flexible part of the cables will reach out to ca. 175 meters from the turbines, where they will be anchored to the seabed by a vertical hold down anchor. In addition, horizontal anchoring of the dynamic risers will be by an approximately 100m long rock berm.

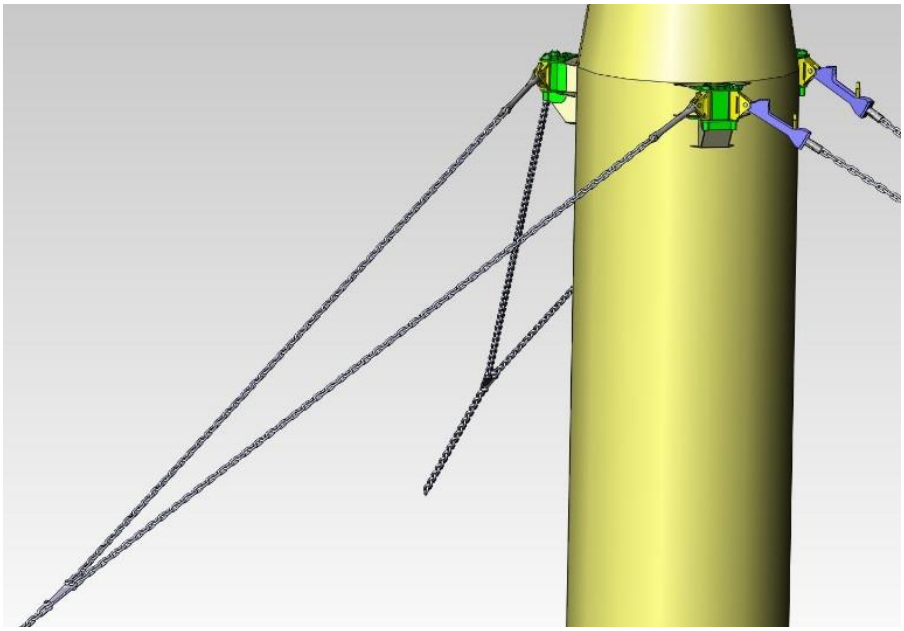


Figure 2.5. Drawing of mooring arrangement.

Table 2.3. Calculated cable lengths

Route	Type	Length (m)	Lenght on seabed
Peterhead HDD Exit - HS5	Export Cable	25723,5	25598,5
HS3-HS5	Infield Cable	1915,5	1665,5
HS2-HS3	Infield Cable	1526,4	1276,4
HS4-HS5	Infield Cable	1710,2	1460,2
HS1-HS4	Infield Cable	2161,3	1911,3

The placement of the inter-array cables is located as indicated in the map in figure 2.2. As shown, the inter-array cables will link up HS1 to HS5 via HS4, and HS2 via HS3 to HS5. The export cable, which will transport electricity from the Pilot Park to shore, will be linked up to HS5 and follow a cable route to shore as shown in figure 5.1. The export cable will be trenched where seabed conditions allow. Where this is not possible cable protection in the form of rocks and/or concrete mattresses will be required. Both the inter-array and export cables will have 33 kV transfer voltage. The export cable will connect to the local distribution network at SSE Peterhead Grange substation via an

underground cable approximately 1.5 km in length and a small switchgear yard facility close to Peterhead Grange substation.

3 Lighting and Marking Plan – LMP

3.1 Aviation obstruction lights

All turbines will have two red medium intensity aviation obstruction lights, which will be in accordance with the current CAA and MOD navigational and aviation lighting policy and guidance. The two red medium intensity lights will be mounted on the nacelle of all structures and have a maximum 2 000 candela output and a Morse "W" 5 seconds flash character, with a possibility to dim to as low as 200 candela based on visibility or SAR operations. The horizontal beam pattern will be 360° and the vertical beam pattern a minimum of 3°. In addition, the lights will also have an infra-red light output making them visible with night vision goggles. All aviation lights are GPS synchronised and harmonised to the marine navigation lights.

The lights will comply with the specific requirements for obstruction lights described in UK CAA CAP 393 article 220 (10 January 2015) and Policy statement of November 2012 concerning lighting of wind turbines in UK territorial waters, and with UK MOD requirements for infra-red light for marking of wind turbines.

Obstruction lights and its control system will be monitored remotely.

3.2 Navigational lighting

All structures will be marked with flashing yellow (5s) light visible through 360^{o} with a 5nm range and a vertical beam pattern of 8° in order to meet navigational lighting requirements from MCA, as detailed in International Association of Marine Aids to Navigation and Lighthouse Authorities ("IALA") Recommendations O-139. All lights have an availability of not less than 99.8% (IALA Category 1) and lanterns on all individual turbines will be synchronised.

Obstruction lights and its control system will be monitored remotely.

3.3 Sound signal requirements

2 nautical miles Fog Signal will be installed on two of the wind turbines (HS2 and HS4).
Sound signal availability of not less than 97.0% (IALA Category 3).

3.4 AIS and radar reflector requirements

AIS will be installed on two of the wind turbines (HS1 and HS3), whereas there will be Passive Radar Reflectors on all turbines. AIS availability of not less than 97.0% (IALA Category 3).

3.5 Marking

ID marking signs with lighting will be placed on four different locations on the external platform of each wind turbine, approximately 23 m above sea level. The prefix and numbering system of the marking signs for each turbine will be “HS1”, “HS2”, “HS3”, “HS4” and “HS5”. The size of the marking signs will be approximately 1.25 x 1.0 m. The signs can therefore be read from 150 m. Helicopter lighting and marking will be in accordance with CAP 437 and letters and numbers on the helihoist landing area 1.5 m tall seen from above.

The turbine blade hover-reference markings will be located at 10, 20 and 30 meters (counted from the hub and outwards), there will be a 600 mm diameter filled red dot on each side of each blade, a total of 6 dots on each blade. The tip the blade will also be painted red.

The colour marking of the FWTs will be according to IALA Recommendations O-139. The substructures will be painted yellow (RAL1004) up to an elevation of 20 meters above sea level. Boat landings and ladders will be painted in a contrasting white (RAL 9016). The towers will be painted white (RAL 9016), whereas the wind turbine generators will be light grey (RAL 7035).

4 Construction Method Statement – CMS

The construction (installation) method for the wind turbines and cables are generally following the description included in the Enviromental Statement section 4.4 (page 4-7 and 4-8), and will furthermore follow CDM 2015 (Construction Design Management) good working practices.

4.1 Fabrication and installation

The fabrication of the wind turbine generators, the mooring system and cables will be done in different European countries (see overview in table 4.1), and a yard at Stord in western Norway has been selected as assembly site for the turbines. This means that the different elements of the windfarm will be brought in by vessels directly from the fabrication sites and or assembly site to the offshore wind farm site. The only activities onshore in Scotland linked to the installation works will be the pull in of the export cable through the preinstalled HDD borehole, and possible personnel transport to and from vessels.

The first marine operation planned is the installation of the suction anchors, which is expected to start early April 2017, and is expected to take approximately two weeks. Technip will be the main contractor for the marine operations, but additional companies may be subcontracted to provide some of the vessels needed (Solstad, van Oord). A new Offshore Support Vessel, Deep Arctic (Technip), will be used for the anchor installation.

Mooring chain installation is planned to start mid May 2017, and this is also expected to last for approximately two weeks. The tug Normand Prosper (Solstad) will be used for mooring chain installation, and later on hook up when the wind turbines arrive on site. Transfer of the FWTs from the assembly site in Norway and installation will be done in July. Towing of the turbines from Norway

will be done by a main tug and an assisting tug (actual vessels to be nominated later, but will be supplied by Solstad).

Cable installation is planned to commence mid-July and will last for approximately 5 weeks. Statoil has contracted Subsea7 Ltd to do the cable installation, both the infield cables and the export cable, including trenching and eventual rock installation. The primary plan is to trench the cables, but if dumped rock protection should be required, van Oord will be subcontracted to do this.

All installation works is planned to take place during the spring and summer 2017, which should ensure reasonable weather conditions for the installation works. Should poor weather conditions occur, the construction schedule do have sufficient slack to allow for delays and still be able to complete the works, including commissioning, by the end of 2017.

A guard vessel) will be on the site throughout the construction period until the first floating wind turbine is installed.

4.2 Roles and responsibilities

The construction works will follow the Health and Safety CDM 2015 regulations (Construction Design and Management Regulations 2015 No.51). CDM 2015 describes both client duties and appointment and roles of principle designer and principle contractor. Statoil ASA owns 100% of the Hywind Scotland asset, and will act as both client, principle designer and principle contractor. The relevant good working practices/requirements listed in CDM 2015 are implemented through Statoil's overall management system and the specific managing documents for the Hywind Scotland project.

.A project organisation for the Hywind Scotland project has been established and is based in Norway (figure 4.1). Statoil's project personnel responsible for offshore installation activities and key support functions (safety, sustainability and consenting):

Leif Delp, Project Director

- Tom R. Guttormsen, Marine Operations Manager
- Håkon Graven, SSU (Safety and Sustainability) and Consenting Manager
  - Ove Vold, Consenting and Stakeholder Manager
    Environmental Clerk of Works (ECoW)

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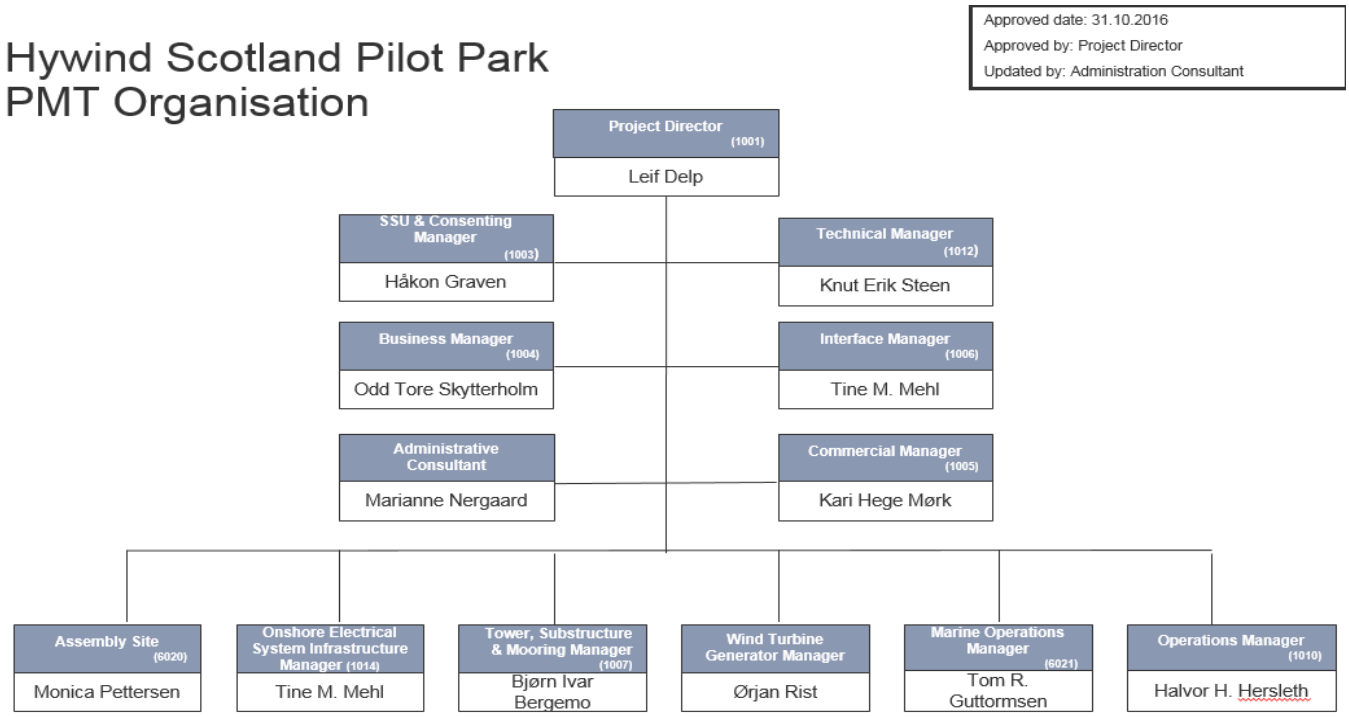


Figure 4.1. Hywind Scotland Pilot Park Project Management Team

For all contracts Statoil has dedicated company representatives, see table 4.1. Details on the Contractor's project organisation and potential sub-contractors can be made available at a later stage if requested. Additional contact details for the contractors/sub-contractors who will operate in the project area will be provided prior to construction (ref. also the ERCoP).

Table 4.1. Overview of contractors

Contract	Contractor	Contractor Contact Name	Statoil Company Representative
Engineering and procurement support	Aibel Bergerveien 5, 1375 Billingstad, Norway	Marianne T. Kvaale	Magnus Frøysok
WTG and service agreement	Siemens Wind Power Sir William Siemens Square GU16 8QD Frimley, Camberley, UK	Matthew Letts	Ørjan Rist
Substructure fabrication	Navantia Windar Avenida das Pias 15480, Fene, Spain	P.Rivera	Bjørn Ivar Bergemo
Suction anchor fabrication	Isleburn IVI69 XJ Airfield Road, Evanton, Ross-Shine, UK	Sean Nicholson	Christian Ruud
Mooring chain fabrication	Vicinay Marine Plaza Sagrado Corazon 4 48011, Bilbao, Spain	Soraya Yustos	Amir Mohd Ghazali
Substructure mooring connection system	MacGregor Pusnes 4818 Færvik, Norway	Bjørn Bai	Amir Mohd Ghazali
Tower fabrication	Navacel Rivera de Axpe 48950 Erandio, Spain	Antonio Ynat	Bjørn Ivar Bergemo
Tower internals	Aluwind Kielbergvej 5750 Ringe, Denmark	E. Edal	Bjørn Ivar Bergemo
Electrical system infrastructure	Balfour Beatty Raynesway, Derby DE21 7BG, UK	Rob Luther / Graeme Hopkins	Tine Marit Mehl
Heavy lift mating operations	Saipem Wood Street 12-42 KT1 1TG Kingston upon Thames, UK	Benjamin Stokes	Tom R. Guttormsen
Marine operations	Technip Philip Pedersens vei, 1366 Lysaker, Norway	Yngve Børstad	Tom R. Guttormsen
Offshore cable fabrication	Nexans Inspurten, 6450 Oslo, Norway	Olivier Codou	Knut Harald Lien
Offshore cable installation	Subsea7 Prospect Road, Amhall Business Park AB32 6FE Aberdeenshire, UK	Per Kristian Forbod	Knut Harald Lien
Assembly site services	NorSea Group Risavika Havnering 4056 Tananger, Norway	Kenneth Bjørholm	Monica Pettersen
Solid ballasting and rock installation	Van Oord Schaardijk 211 3063 NH Rotterdam, The Netherlands	Koos Van Oord	Stig Øvstedal
Marine warranty surveyor	Global Maritime Kanalsletta 8, 4033 Stavanger, Norway	Svein Erik Skribeland	Tom R. Guttormsen
3rd paty verifications	Anko Fjøsangerveien 50, 5059 Bergen, Norway	Jan Helge Due	Anne Fausa

5 Cable Plan – CaP

The routing of the export cable is based on geophysical, geotechnical and benthic surveys made during the pre-consent planning phase, and the route corridor is in accordance with the route plan presented in the Environmental Statement, see figure 5.1 below. Further information on the baseline condition along the cable corridor is given in section 8 of this document, with references to the relevant parts of the Environmental Statement.

Additional UXO surveys and verification have been performed. These surveys have only been used for removing potential obstructions from the route (boulders and debris such as old fishing gear and wires) or decide on eventual micro siting of the route. No UXO was found. The pipeline which was planned be laid from the Goldeneye platform to St. Fergus, has not been considered further, due to cancellation of the Peterhead Carbon Capture Project (ref. condition 3.2.2.10 h).

A preliminary burial risk assessment made indicate that trenching may be difficult along various sections of the route, totaling a total length of up to 2 km, Sections of the route which may be difficult to trench successfully due to soil conditions and boulders are located for the most part 0-7 km from shore. An updated burial risk assessment will be provided by the cable installation contractor (Subsea7) and will be submitted as required (ref. condition 3.2.2.7 c) when available. It should be underlined that the final conclusion regarding burial and need for rock/gravel berm installation to protect the cable can only be made after cable installation is done.

Electromagnetic field is not considered to be an issue for neither the infield cables nor the export cable. The main reason for this is that they will all be AC cables, which means that electromagnetic fields will be more or less neutralised. In addition, the cables themselves will have shielding, and furthermore all cables except the flexible parts of the infield cables will be trenched/buried. The cable manufacturer will prepare a desk top study giving additional details on electromagnetic fields and temperature, and this will be submitted as required (ref. condition 3.2.2.10 d) when ready.

Details on the cable lengths are given in table 2.3 in section 2, and the location of the cables are shown in figure 5.1 and 2.2. Cable specifications are given in table 5.1 below, and cross sections of the static section and dynamic section of cables are shown in figure 5.2 and 5.3. The riser configuration is given in figure 5.3.

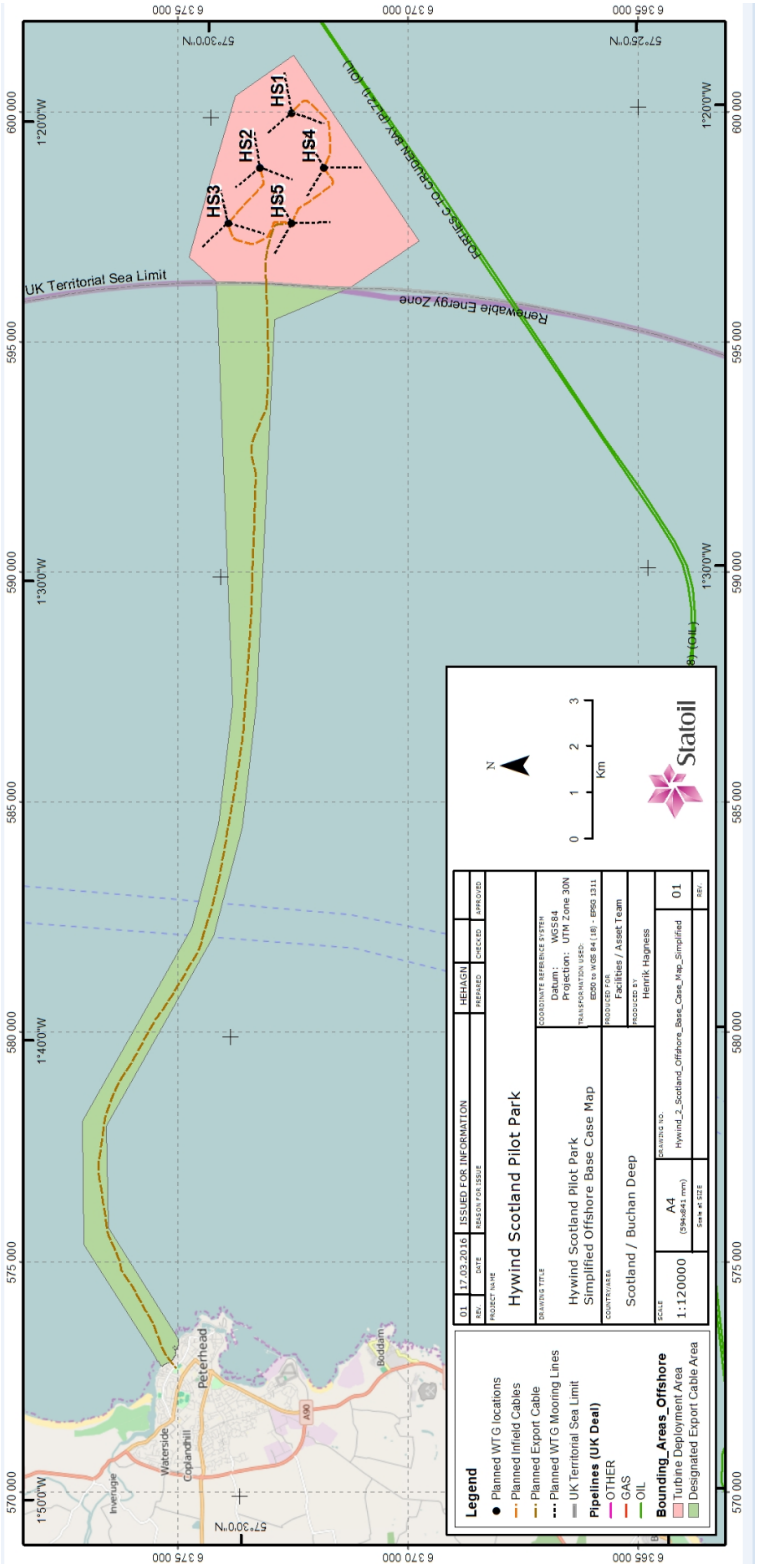
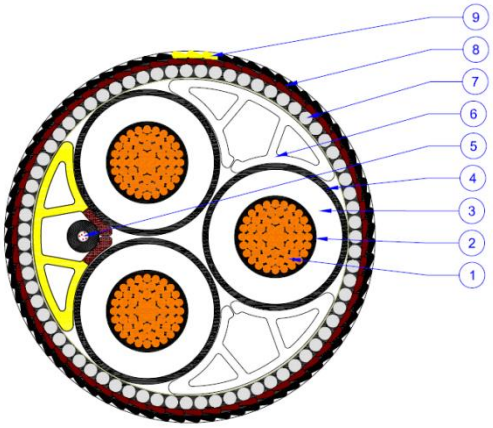


Figure 5.1. Map showing the location of the wind turbines and the export cable route.

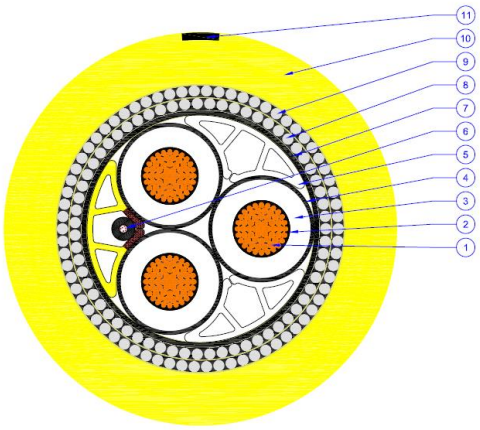
Table 5.1. Cable specifications

Power Cable	Infield	Export	
Property	**Value**		**Unit**
OD	169	115	[mm]
Mass (empty)	49	26.1	[kg/m]
Mass (flooded)	50.5	27.5	[kg/m]
SW (filled & flooded)	271	166	[N/m]
SW/OD ratio	163	147	[Kgf/m²]
Specific gravity in seawater	2.13	2.45	



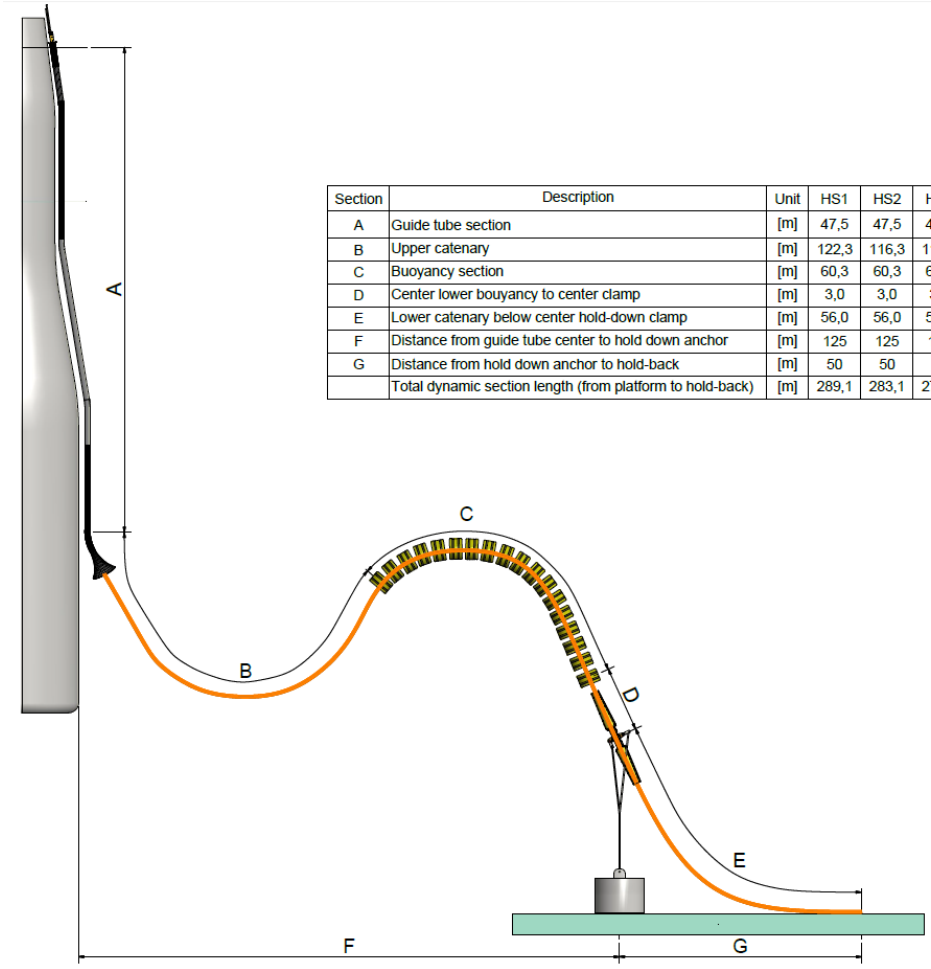
POS.	QTY.	DESCRIPTION	NOM. THICKNESS, mm	NOM. DIAMETER, mm
9		ORANGE STRIPE, 3500 TEX	-	-
8	2	PP YARN, 3500 TEX	2	115
7	71	ARMOUR WIRE ROUND (WITH BITUMEN)	4.2	-
6	3	PROFILED PE FILLER	-	-
5		FO CABLE 48 SM FIBRES	-	10
4		INSULATION SCREEN, SEMICONDUCTIVE, LE 0592	-	45.5
3		INSULATION, LS 4201 S	8.0	-
2		CONDUCTOR SCREEN, SEMICONDUCTIVE, LE 0592	-	-
1	3	CONDUCTOR 400mm² CU	-	23.5

Figure 5.2. Cross section export cable – static section



POS.	QTY.	DESCRIPTION	NOM. THICKNESS, mm	NOM. DIAMETER, mm
11		BLACK STRIPE, APPROX. 13 mm WIDTH	-	-
10	2	OUTHER SHEATH (YELLOW), HE 6063	22	169
9	70	ARMOUR WIRE ROUND (WITH BITUMEN)	5	-
8	63	ARMOUR WIRE ROUND (WITH BITUMEN)	5	-
7		INNER SHEATH	2.2	103
6		FO CABLE 48 SM FIBRES	-	10
5	3	PROFILED PE FILLER	-	-
4		INSULATION SCREEN, SEMICONDUCTIVE, LE 0592	-	45.5
3		INSULATION, LS 4201 S	8.0	-
2		CONDUCTOR SCREEN, SEMICONDUCTIVE, LE 0592	-	-
1	3	CONDUCTOR 400mm² CU	-	23.5

Fig 5.3. Cross section dynamic part of cables (i.e. all infield cables and export cable riser)



Section	Description	Unit	HS1	HS2	HS3	HS4	HS5
A	Guide tube section	[m]	47,5	47,5	47,5	47,5	47,5
B	Upper catenary	[m]	122,3	116,3	111,3	118	112,7
C	Buoyancy section	[m]	60,3	60,3	60,3	60,3	60,3
D	Center lower bouyancy to center clamp	[m]	3,0	3,0	3,0	3,0	3,0
E	Lower catenary below center hold-down clamp	[m]	56,0	56,0	56,0	56,0	56,0
F	Distance from guide tube center to hold down anchor	[m]	125	125	125	125	125
G	Distance from hold down anchor to hold-back	[m]	50	50	50	50	50
	Total dynamic section length (from platform to hold-back)	[m]	289,1	283,1	278,1	284,8	279,5

Figure 5.3. Riser configuration

The cable laying will be done using a dedicated cable laying vessel, and after laying, trenching will be done using a Q1444 trenching system[2] (figure 5.2). The trencher can be operated either in a jetting mode or chain cutter mode. Chaincutter mode is expected to be used for the most part of the export cable. Jetting mode is expected to be used for the infield cables (if decided to be trenched).

Where trenching proves not to be feasible due to soil conditions, the intention is to install rock/gravel berms as cable protection. Small size rock, 1-5” (maximum 135 mm) will be used. A fall-pipe solution will be used during rock installation to ensure that positioning of the rock is as accurate as possible.

[2] http://www.fugro.com/docs/default-source/Expertise-docs/Our-Services/subsea/q1400-trenching-system-flyer-rev-1-2016_lr.pdf?Status=Master&sfvrsn=12

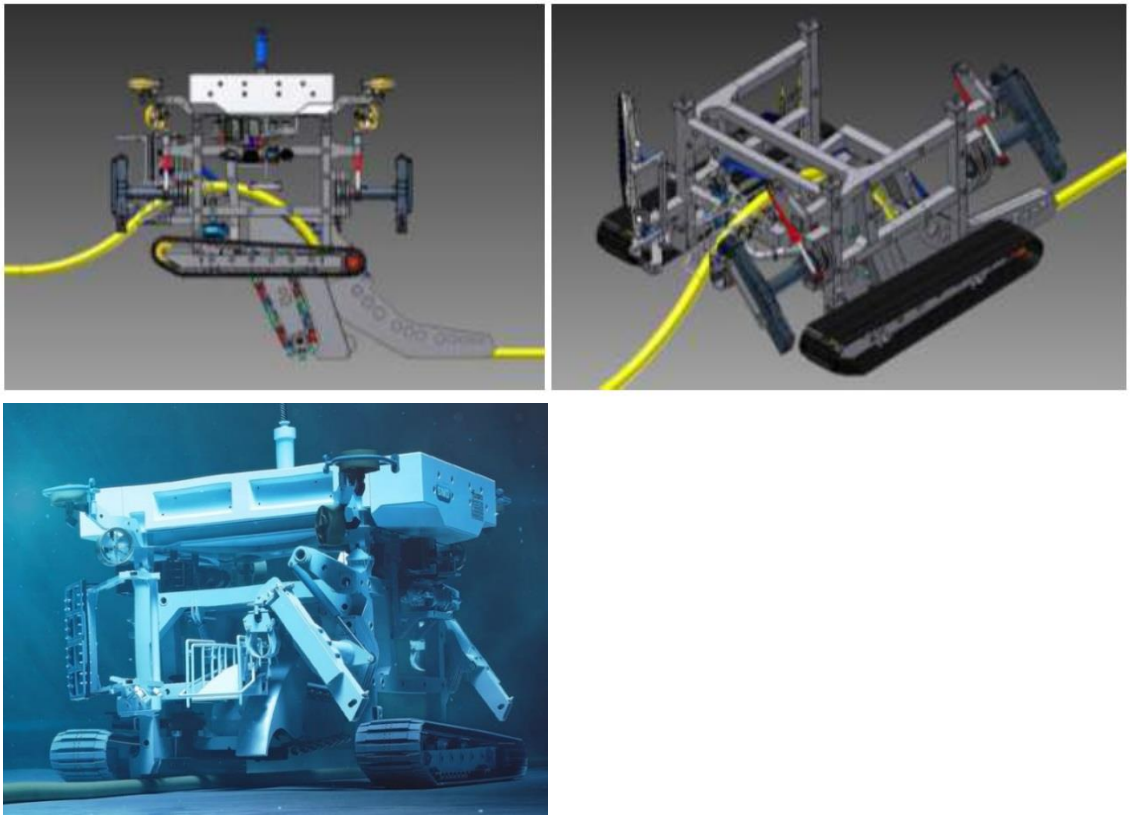


Figure 5.2. Illustrations of the cable trenching machine

6 Vessel management Plan – VMP

Vessels needed during the installation period are mentioned in section 4. Not all vessels to be used during the installation of the floating wind turbines and the cable laying are nominated yet. Further specifications on each vessel will be included in the Emergency Response and Coordination Plan (ERCoP), including the master's name, vessel type, vessel IMO number and vessel owner or operating company. The Marine Licence will be updated with vessel details accordingly.

The following types and number of vessels to be employed in the installation works are:

1 Offshore Support Vessel (Deep Arctic) – suction anchor installation
1 Tug (Normand Prosper) – mooring system installation
1 - 2 Main tugs – towing and installation of FWT's
1 - 2 Supporting tugs – support during towing and installation of FWT's
1 Cable laying vessel (Skandi Acergy)
1 Trenching Support Vessel (Fugro Saltire) – trenching of cables
1 Diving Support Vessel – cable trenching and rock protection
1 – 2 Guard vessels (i.e. fishing boat supplied by SFF)
2 Crew Transfer Vessels – transporting personnel to the FWTs

As mentioned the main tug and supporting tug to be used for towing and installation of the FWT's may be doubled up with similar vessels to speed up the installation works, however this is still to be determined.

As described in section 4 all elements to be installed are expected to be brought in directly from the fabrication sites or the assembly site in Norway, and the only working port in Scotland which is expected to be used is Peterhead Port (for personnel transfer typically twice a day during cable installation and commissioning).

Vessel management and coordination will be done through daily meetings (conference calls) headed by the Marine Operations Manager and supported by a technical on duty, Statoil's UK Offshore Wind Control Centre at Greater Yarmouth and relevant vessel representatives. Work permits for the different vessels involved will be issued by the Offshore Wind Control Greater Yarmouth.

Installation and hook up of the FWT's and also the cable installation works is planned to take place in June, July and August, which is the time when auk species with chicks may be expected to occur in the area. However, all these works will be done at low vessel speed (below the speed limit recommended to avoid damage to auks during this period). Statoil will ensure that the Scottish Wildlife Watching Code is observed by all vessels used for the installation works during the months July and August (also in relation to marine mammals).

Aviation lighting and navigation lighting will be installed on the FWT's at the assembly site in Norway, and will be operational during towing should that be required.

7 Construction Programme - CoP (Schedule)

The first offshore installation activity is installation of the suction anchors. The commencement of this activity is scheduled to the beginning of April 2017. An overview of the installation activities with estimated timings is given in figure 7.1 below. There will be no use of onshore lay-down areas. Contingency (waiting) for poor weather or other unforeseen delays has been built into the schedule. Final commissioning is scheduled to end of October 2017.

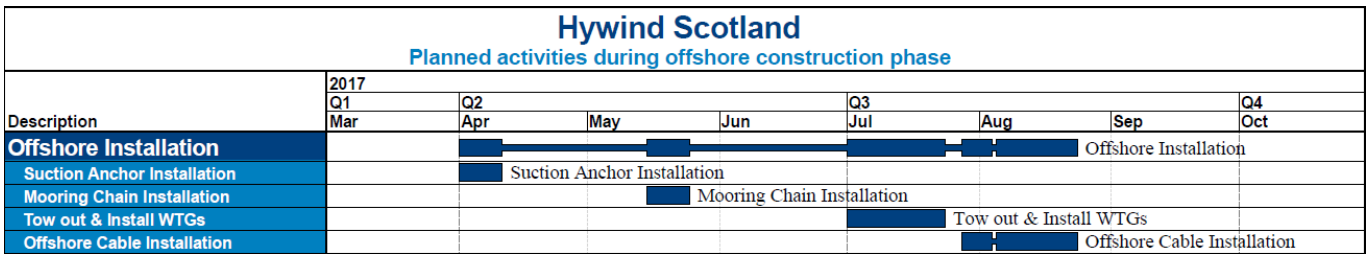


Figure 7.1. Hywind Scotland installation programme

8 Baseline description

As there is no change in the project area or the project lay out compared to the description given in the Environmental Statement, reference is made to the ES document (chapter 9.4, pages 9-5 to 9-29) submitted as part of the licence application.

In order to provide input data on benthic communities, Statoil commissioned MMT to conduct a geophysical and environmental baseline survey in 2013, which included a combination of remote video/stills photography and grab sampling (see the ES document chapter 8.4.3, page 8-9 and figure 8-4 at page 8-8, and chapter 8.4.8, pages 8-12 to 8-16). The results regarding benthic communities have been summarised in the ES document chapter 9.4 (pages 9-5 to 9-29). Two types of Annex I Habitats were observed, Stony Reefs and *Sabellaria spinulosa* Reefs, but the ES determined the impacts on these habitats to be insignificant. Only very small areas of low-grade biogenic reefs and patches of stony reefs have been identified. The export cable has been routed to minimise the impacts on *Sabellaria*. As there is no change in neither the turbine area nor the cable corridor compared to what was presented in the ES (chapter 5.3.1, page 5-2), no additional surveys have been done.

During the first year of seabirds at sea survey prior to the submission of the Environmental Statement a relatively high density of auks was observed in the project area in July-August. The density was lower the second year, confirming significant annual variability which is quite normal for seabirds at sea. Further details can be found in the ES document (chapter 11-4, pages 11-4 to 11-22). No additional surveys have been carried out, but qualitative assessment of densities will be made during the installation phase in order to assess need for special precaution.

9 Environmental Management Plan – EMP

As a company, Statoil has a clear goal to ensure sustainable development and is committed to minimising environmental impacts. The Statoil environmental management system is fully compatible with recognised environmental management standards, including ISO 14001. Furthermore, our contractors are required to meet the ISO 14001 standard. A commitment register including all commitments made during the Environmental Impact Assessment phase was included in the Environmental Statement, supplemented by requirements given in the Marine Licence. An updated commitment register is attached (Appendix 1).

An Ecological Clerk of Works as required in the marine licence has been appointed. Statoil will use internal resources to fill this role (Ove Vold) following the scope of work as agreed for the HDD activities in 2016. The ECoW will be responsible for reporting any incident and routine reporting on progress of the work and the implementation of mitigation measures and conditions. Reporting will include use of chemicals (types and volumes) during the installation works, eventual observations of high densities of auks in July-August and of marine mammals close to the installation works.

Statoil will ensure that all vessels and their crew are made aware, of and are required to adhere to the Scottish Marine Wildlife Watching Code. Statoil will also ensure that all vessels involved in the installation works adhere to relevant IMO guidance on ballast water and transfer of non-native marine species (ref. MGN 81, Guidelines for the Control and Management of Ship's Ballast Water to Minimise the Transfer of Harmful Aquatic Organisms and Pathogens).

No objects of marine archaeological interest have been identified in the project area, ref. chapter 13. Therefore, marine licence condition 3.2.1.2 b) regarding Written Scheme of Investigation is not deemed relevant to the project.

Statoil do have internal waste handling procedures which all projects and contractors have to adhere to. These requirements build on a strategy where priority is on avoiding waste generation. Where waste generation cannot be avoided, technical and operational measures, including separation, collection and disposal solutions for different classes of waste, shall be implemented to optimise the reuse, material recycling or energy recovery of the waste. Waste shall be stored and transported in such a way that accidental releases are prevented.

In the Hywind Scotland Pilot Park Project no particular waste generation issues are foreseen, and vessels involved are expected to primarily bring any household waste or other waste to their home port for disposal. Should there be a need to bring any waste ashore in Scotland, this will be done in consultation with SEPA (Robert MacDonald, SEPA Elgin Office, Shaw House, Mid Street, Fraserburgh, AB43, tel.: 01346 510502), and only licenced carriers will be used to handle any waste.

10 Fisheries Management and Mitigation Strategy – FMMS

Statoil intends to follow the FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison[3] as a basis for fisheries management and mitigation in the Hywind Scotland Pilot Park project during the construction phase.

During the pre-consent planning phase and the first year of construction (HDD construction works and surveys in 2016) Statoil engaged with the Scottish Fishermen Federation (SFF) and Buchan Inshore Fishermen's Association (BIFA). An agreement was signed with SFF for having a fishery liaison officer (FLO) on site to ensure good communication with local fishermen, and to reduce and if possible avoid difficulties for the fisheries during surveys and construction works. A guard vessel will be engaged during the installation phase. The guard vessel will facilitate communication with fishermen during the construction works at Buchan Deep (during suction anchor and mooring chain installation as well as during tow out and hook up of turbines). The intention is to extend the agreement with SFF to have an FLO available on site (possibly on board the guard vessel) during the

[3] https://www.thecrownestate.co.uk/media/5693/floww-best-practice-guidance-for-offshore-renewables-developments-recommendations-for-fisheries-liaison.pdf

cable installation works in 2017. In addition, an onshore FLO will be engaged to deal with the near shore fisheries during cable laying activities.

As mentioned in chapter 5, small size rock will be used should it be necessary for cable protection (in the event trenching might not be possible). Small size rock combined with exact placement by the use of a fall-pipe solution should generally reduce any inconvenience for the fisheries. Statoil will consult with SFF on the details regarding installation of any rock berms for cable protection.

11 Emergency Response Co-operation Plans – ERCoP

Statoil do have a well-established companywide system for emergency response upon which a specific emergency response and reporting procedures will be established also for Hywind Scotland, as well as a stringent safety management system[4]. Statoil uses SYNERGY for recording and reporting any incidents, and our contractors are required to use this system as well. If any serious health and safety incidents occurs on the site, Statoil will report this to the Health and Safety Executive as well as notify Marine Scotland within 24 hours of the incident occurring. Further details on the emergency response and reporting of HSE incidents during installation, will be given in the separate ERCoP for the construction phase, and is not included in this document.

12 Navigational Safety Plan – NSP

Navigational safety is both related to the operation of vessels involved in the construction activities, as well as other vessels trafficking the project area. The operation and coordination of the vessels involved in the construction works are described in section 6. This section primarily describes actions planned to ensure marine safety in relation to third party vessels and activities.

Statoil will notify the UK Hydrographic Office (“UKHO”) of the proposed works to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the Notice to Mariners system. Local mariners, fishermen’s organisations and HM Coastguard (National Maritime Operation Centre) will be made aware of the marine operations through local Notice to Mariners and other means as appropriate. Furthermore, details of the works (timing, location and vessel routes) will be published in the Kingfisher Fortnightly Bulletin.

Defence Geographic Centre (DGC) will be notified at least 10 days prior to tow out of turbines and provided with the required turbine information to enable updating of aeronautical charts. In order to ensure that aviation stakeholders are aware of the turbines while aviation charts are in the process of being updated, aviation stakeholders will be notified through a Notice to Airmen (NOTAM).

[4] http://www.statoil.com/en/EnvironmentSociety/security/Pages/Safety.aspx

Navigational lighting and marking is described in chapter 3 above, and the mooring system is described in chapter 2. No temporary anchoring area is foreseen, and no temporary construction lighting and marking (including buoyage) are planned for, as the navigational lighting and marking will be installed prior to towing of the turbines from Norway. A guard vessel will be employed to assist in communicating with other vessels and to implement a temporary construction safety zone of 500 meters around any vessel and turbine.

Emergency and coordination arrangements for the construction phase are described in the ERCoP document described in the previous chapter. Statoil will ensure compliance with the Marine Guidance Note (MGN) 543.

13 Marine Archaeology Reporting Protocol – MARP

Surveys done as part of the planning and Environmental Impact Assessment did not confirm presence of any objects of marine archaeological interest in the immediate project area, but a few anomalies were identified along the export cable corridor (ref. the ES document page 16-18). A detailed survey (UXO survey) carried out in 2016 did not identify any signs of such objects. A reporting protocol for the accidental discovery of cultural remains will be implemented in line with The Crown Estate (2014) Protocol for Archaeological Discoveries: Offshore Renewables Projects, prepared by Wessex Archaeology Ltd for The Crown Estate[5].

[5] http://www.thecrownestate.co.uk/media/148964/ei-protocol-for-archaeological-discoveries-offshore-renewables-projects.pdf