



Project background

The aim of the Shetland HVDC Connection Project is to allow the export of renewable energy from Shetland to the UK mainland, connecting Shetland to the National Electricity Transmission System for the first time.

There is currently significant renewable generation proposed on Shetland and recent developments in relation to government funding available to onshore island generators has increased the possibility that these projects will be progressed. Scottish Hydro Electric (SHE) Transmission has a license requirement to provide connection to the UK's transmission network when requested by a generator.

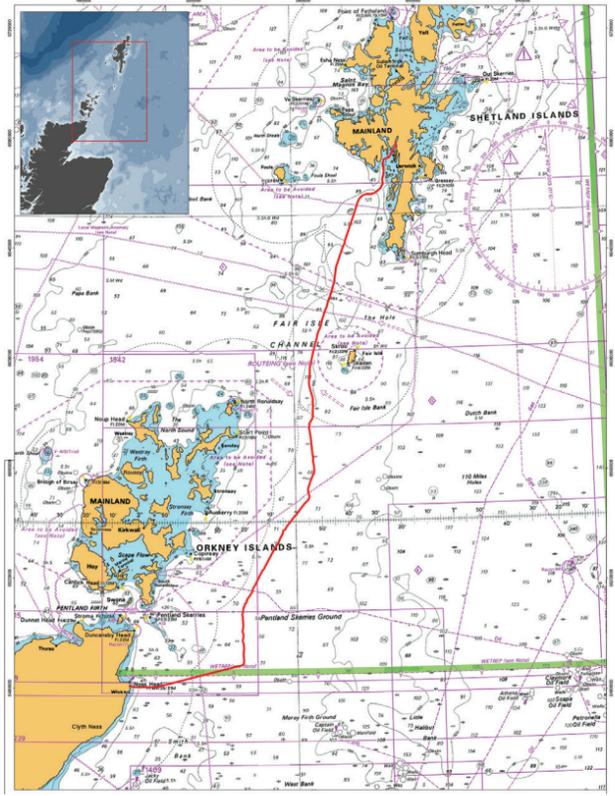
In early October 2018, SHE Transmission submitted a Needs Case for the Shetland HVDC link to Ofgem. The Needs Case outlined the proposed solution to connect renewable generators on Shetland via delivery of a single 600MW subsea circuit from Weisdale Voe in Shetland to Noss Head in Caithness, where it will connect with the Caithness-Moray transmission link.

The need for the Shetland HVDC link has been further reinforced by the recent "minded to" decision made by Ofgem to support the utilisation of the link to supply power to the distribution network on the Shetland Isles, when on island renewable generation is not sufficient to meet demand. Utilisation of the link in this manner reduces the islands need for fossil fuel derived power generation. The Shetland islands are presently supplied by a Power station in Lerwick and by power exported from the Sullom Voe site terminal.

Whilst the 'minded to' decision regarding of the Needs Case is a significant step forward for the project, the transmission link is subject to the success of Shetland renewable developers in the Contract for Difference (CFD) auction and regulatory approval.

In addition to the subsea HVDC cables, the other key elements of the Shetland HVDC Link include:

- Construction of a 132 kV substation and HVDC Converter Station at Upper Kergord, Shetland
- Construction of approximately 8km of underground HVDC cable between the HVDC Converter Station at Upper Kergord and the landfall location at Weisdale Voe
- Construction of an underground HVDC cable between Noss Head, Caithness and;
- A new Caithness HVDC Switching Station located to the north of Wick
- Upgrades of existing cable circuit at Noss Head, Caithness.



Route corridor (+/- 100 m)
--- Scottish Territorial Seas

Today's event

We are holding public consultation events in both Wick and Lerwick to provide information relating to the subsea HVDC cable element of the project, prior to submitting a Marine License application to Marine Scotland later this year.

The proposed Subsea HVDC Cable circuit

The proposed subsea cable circuit is approximately 250km in length, between Weisdale Voe and Noss Head.

The cable bundle will consist of two conductor cables and one fiber optic communications cable, to allow control of the substation and HVDC converter station.

In order to take the cables safely from land into the sea, three horizontal directionally drilled ducts will be drilled, though which the cables can be pulled. Alternatively, at each landfall a trench may be dug across the foreshore into which a duct would be placed and buried allowing the cables to be pulled ashore.

Once offshore, the cable bundle will be buried in the seabed. Where this is not possible it will likely be protected using a cable protection system or will be covered in crushed rock.

As part of this Pre - application Consultation Process (PAC) we are looking for your views and comments on the proposed subsea cable between Weisdale Voe and Noss Head.



Route Development and Marine Survey

The subsea route has been selected and developed over the last 10 years, to incorporate comment from Statutory Consultees, other marine users and local communities, as our understanding of the seabed, metocean conditions and technology advanced.

Three major survey campaigns have been undertaken to inform the development of the subsea cable route. These campaigns took place in 2008, 2013 and 2018. The survey works were undertaken by MMT and included gathering detailed information on bathymetry, seabed sediments, biological features and wrecks.

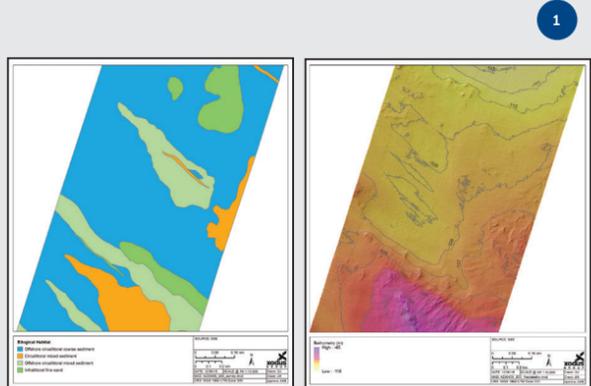
The Survey data has been used in combination with information on other users of the sea such as fishing and shipping to develop a route and cable burial risk assessment.

Marine and nearshore survey operations included:

1. Geophysical data acquisition

To determine water depths, seabed features, shallow geology, object detection and cable crossing positions.

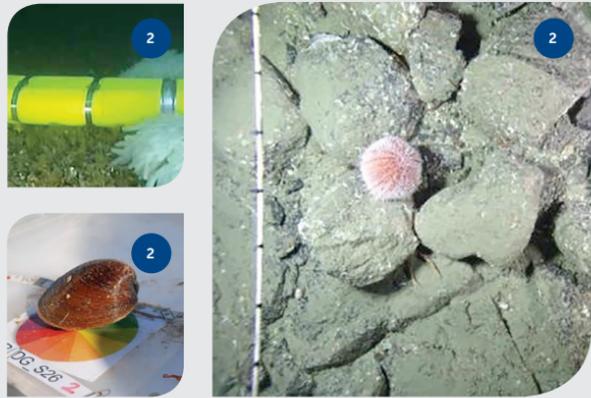
Instruments used: Multibeam Echo Sounder (MBES), Side Scan Sonar (SSS), Sub-bottom Profiler (SBP) and Magnetometer (offshore and nearshore).



2. Environmental survey

The Data from the Side Scan Sonar (SSS) and the Multi Beam Echo Sounder (MBES) is used to create habitat boundaries which are then checked using cameras and grab samples to create maps of the type and extent of seabed habitats.

Instruments used: grab sampler and drop-down camera.



3. Geotechnical survey

To determine the structure and physical properties of the surficial and shallow sediment layers. Tools are used to recover cores of sediment and push a cone through the sediment measuring the resistance.

Instruments used: Vibrocorer and Cone Penetrometer Testing (CPT).





Subsea Cable Installation



The subsea cable route is a corridor approximately 200m wide offshore, and up to 500m wide at the landfalls, in which the cable bundle will be laid.

The installation of the cable can be split into the following campaigns:

1. **Pre-lay survey** - a detailed survey may be undertaken along the consented corridor
2. **Pre-lay grapnel run** - a grapnel will be used to clear any abandoned cables or discarded or abandoned fishing gear from the route.
3. **Boulder/Debris Clearance** - where boulders / debris cannot be avoided by route engineering, any boulders / debris which present a threat to subsea operations will be removed.
4. **There are two main options to enable cable burial:**
 - a) **Pre-lay trenching** - a plough is used to create a trench into which the cable is laid prior to the trench being backfilled.
 - b) **Post lay trenching** - the cable is laid on the seabed and a trenching tool follows the cable lowering it into the seabed.
5. **Cable Protection** - in some areas where the seabed is very hard e.g. bedrock or where the sediment is very thin, the cable may be protected using rock placement, concrete mattresses or ducting.
6. **Post Installation Surveys** - detailed MBES surveys will be undertaken to confirm the location of the installed cable and protection e.g. trenching, rock placement etc.
7. **Shore Approaches** - the cable bundle will be brought ashore either through pre-installed Horizontally Drilled Ducts (HDD) or using Open Cut Trenching (OCT) techniques at both landfalls which will emerge on the seabed a suitable distance offshore.





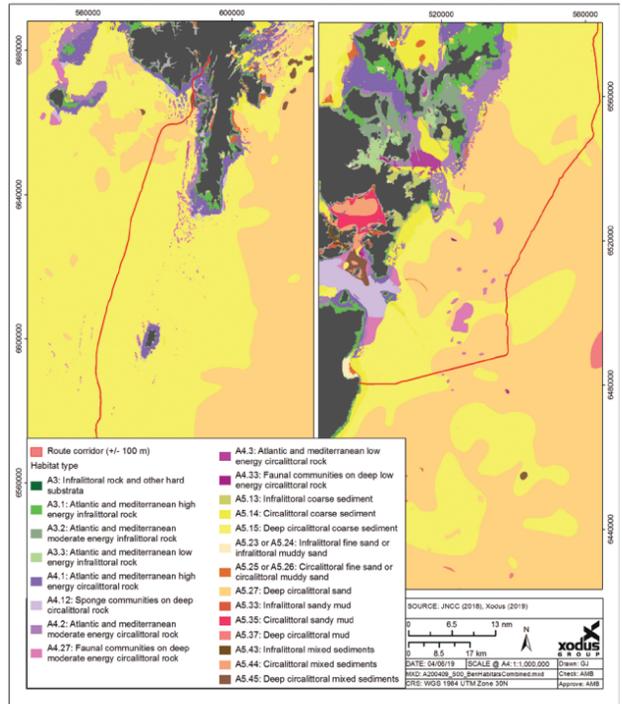
Conditions along the preferred route

Consultation on the project has been undertaken with Marine Scotland. This ensures that focused and proportionate environmental information is produced to accompany the application, which addresses the specific requirements and potential effects.

Following advice from Marine Scotland (and consultees), the possible effects of the installation and operation of the subsea cable will be considered along with the possibility for cumulative effects where there is potential for effects to overlap with other marine and coastal developments.

The following topics will be covered as part of the supporting environmental information:

- Designated sites
- Benthic ecology
- Marine mammals
- Commercial fisheries and aquaculture
- Shipping and navigation



Seabed habitats

The seabed along the proposed cable corridor supports a diverse array of benthic habitats and species. This includes ocean quahog, a long lived and slow growing species of clam, horse mussel beds and burrowed mud.

Approximately 1km offshore from Noss Head in Caithness lies the Noss Head Nature Conservation Marine Protected Area (NCMPA), an area which was identified during the early survey campaigns and subsequently surveyed in detail as part of the Caithness Moray HVDC project.

Much of the seabed along the proposed cable corridor is composed of deep circalittoral coarse sediment and deep circalittoral sand. Along the nearshore waters of the Shetland landfall, there are examples of Atlantic and Mediterranean high energy circalittoral rock, the Caithness coastline where the cable route makes landfall is dominated by circalittoral coarse sediment.

Fish ecology

There is potential for low intensity sandeel spawning along the proposed cable corridor. Sandeels are the main feature of the Mousa to Boddam NCMPA. The NCMPA play an important role in supporting wider populations of sandeels in Scottish waters.

The route overlaps with the nursery grounds of several species namely whiting, common skate, spotted ray, blue whiting, hake, anglerfish, mackerel, sprat, plaice, Norway pout, Norway lobster, lemon sole, herring and haddock. The cable route also coincides with spawning grounds of low intensity for whiting, cod, plaice and undetermined density for sprat, lemon sole, herring, Nephrops and haddock.

The initial review of potential impacts has not identified any significant impacts on these grounds, as such no further study is anticipated however should significant impacts be identified, further study will be under taken.

Marine birds

The route passes through habitat recognized as important for several seabird species. This includes a small area of the Seas off Foula proposed Special Protection Area (pSPA), The route is also in proximity to the Pentland Firth and East Mainland Coast pSPA and the Caithness Cliffs Special Protection Area (SPA).

The effects of the cable on breeding, foraging, moulting and over wintering birds will be considered, where agreed as appropriate with Scottish Natural Heritage.

Marine mammals

Several species of marine mammal have been recorded along the proposed cable corridor including harbour porpoise, bottle nose, white beaked, white sided, Risso's and short beaked dolphin, along with minke whale and killer whale.

Designated seal haul-outs occur close to the proposed cable route, the nearest of these being the Sanda and Score Islands haul-out located approximately 100 m to the southeast of the cable corridor.

To minimise disturbance to marine mammals a subsea acoustic model of the route and works has been developed. This will be used to inform a marine mammal risk assessment. Subsequently a mitigation plan will be developed and used by the project such that impacts on marine mammals are kept to minimum.

The works will follow Joint Nature Conservation Committee (JNCC) guidance and follow the Scottish Marine Wildlife Watching Code so that disturbance to marine mammal's is minimized.



Conditions along the preferred route

Commercial fisheries

Fishing activity occurs along the cable corridor with trawling predominating in the offshore areas and creeling more common in the nearshore areas, especially at the Southern end of the route.

Several fish species have been identified as important to the fishing fleet in the area, including Mackerel, Herring, Cod and Haddock. With Scallops, Crab and Lobster important in the nearshore areas. There are a number of fin fish and shellfish aquaculture sites adjacent to the cable corridor especially in Shetland waters.

The cable route has been developed with input from the fishing industry, over the last 10 years. The installation method will seek to maximise cable burial in sediment and where this is not possible the cable will be protected, where necessary, by a suitable protection systems such as plastic duct or crushed rock. The project will continue to engage with the fishing industry and seek to minimise disruption to the fishing fleet.

Marine archaeology

Based on a review of available records and the marine survey data, an initial archaeological assessment has been carried out and no marine cultural heritage statutory designations were identified along the proposed cable route. The closest designated site was identified as HMS Duke of Albany, located approximately 3.2 km west of the proposed cable route. This site consists of a WWI wreck protected under the Protection of Military Remains Act 1986.

Other wrecks which lie close to the proposed cable route include the U87 boat lost in 1918 located 1.4 km west of the cable route. This submarine wreck represents a war grave and is therefore considered to be of high importance. Three aircraft have been lost in the vicinity of the route however their precise position is unknown.

An archaeological finds plan will be developed and any archaeological remains identified during the works will be reviewed and where necessary avoided by re routing the cable.

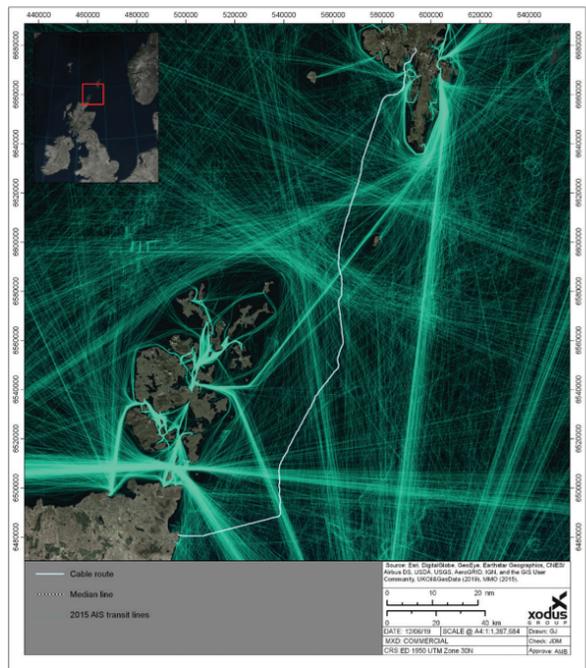
Shipping

The Shipping Heatmap illustrates the shipping activity near the route. Most of the vessels recorded within 10 nm of the proposed route are cargo vessels, along with fishing and offshore supply and work vessels. Several areas of higher intensity shipping traffic can be seen, such as the predominantly East West traffic through the Pentland Firth splitting at the Eastern approach to the Pentland firth and Scapa flow, along with the routes to Kirkwall and Scalloway and the Fair isle channel.

Two anchorages occur in the vicinity of the cable route, i.e. Sinclair's bay and Wick near Noss Head and within Weisdale Voe.

Shipping activity will be used to inform the level of burial and protection that will be necessary to protect the cable from shipping hazards, such as dropped objects.

Shipping Heatmap



Other sea users

A variety of other activities and infrastructure occur near the proposed cable route. Renewable energy and oil and gas infrastructure are all present within 40 km of the route as well as numerous cables and pipelines associated with energy, oil and gas and telecommunications.

The cable route has been designed to cross existing infrastructure, such as telecoms cable and pipelines, at as close to 90 degrees as possible. Crossing and proximity agreements will be developed with existing asset owners.

Recreational activities such as sailing, boating and fishing are known to occur along the proposed cable route, particularly in the coastal areas. Several marinas are found within the vicinity of the proposed corridor, the majority of which are located on Shetland.

Marine dredging is known to occur in numerous sites close to the corridor, the Punds Voe dredge disposal site is located within 3km.

One military practice area (PEXA) intersects the cable route, this area is a firing practice area, however it has no restrictions on the right to transit the area.

The wider use of the sea, by recreational users and other asset owners has been included in the route design and will continue to be considered throughout the development and installation of the project.



Feedback

SHE Transmission will make applications for a Marine License and Marine works license in late 2019. There will be a further round of formal consultation as part of this process.

As part of the marine license application procedure, SHE Transmission is preparing supporting environmental information which will describe the characteristics of the project and provide information on the possible environmental effects of the connection and how they will be managed. When completed this information will be available on the projects dedicated webpage www.ssentransmission.co.uk/projects/shetland and through the formal consultation process at the application stage.

The licensing procedures also require SHE Transmission to consult on its proposals. This exhibition forms part of the consultation process.

Your Feedback

Your feedback on the project is valuable and we would appreciate your input. As you examine this display, please consider the following questions:

1. Have we adequately explained the approach taken to selecting our proposed subsea cable route?
2. Did you find the level of information provided regarding our proposals sufficient?
3. Do you have any comments on the route or its 10 year development process?
4. Do you fish in the area affected by the proposed cable installation?
5. Please provide details of the type of fishing you do, i.e. mobile or static and the locations;
6. Please provide an estimate of how often you fish within 250m of the cable and the time of year;
7. Please provide an estimate of the percentage of your catch caught within 250m of the proposed cable corridor;
8. Have you had experience of other subsea cable projects? If so what do feel has worked well in the past and has had least effect on your maritime activity?

Comments

Comments made are not representations to Scottish Ministers or the consenting authority. If SHE Transmission plc submits an application for a marine licence to Marine Scotland, an opportunity will be given for representations to be made to the Scottish Ministers on the application.

We will be seeking feedback from members of the public and Statutory Bodies until 16:00, Friday 23 August 2019.

Feedback can be submitted online via the project website or via the project Community Liaison Manager:

Community Liaison Manager Kelly Scott



kelly.scott@asse.com



07443 772 946



Kelly Scott
Scottish and Southern
Electricity Networks,
1 Waterloo St,
Glasgow, G2 6AY



Information

Information will also be made available via the project web page and social media channels:

Project Website:

www.ssen-transmission.co.uk/projects/shetland

Find us on Facebook:

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