Project Title/ Location	MeyGen Tidal Energy Project, Phase 1a. Inner Sound.
Date:	29/07/15

MeyGen Tidal Energy Project Phase 1

Vessel Management Plan

Construction Works

Rev	Prepared	Sign Off	Checked	Sign Off	Approved	Sign Off	Date of Issue	Comments
1	F. Johnson	[redacted]	I. Sargent	[redacted]	E. Rollings	[redacted]	30/05/2015	
2	F. Johnson	[redacted]	I. Sargent	[redacted]	E. Rollings	[redacted]	29/07/2015	Consultation response from MSLOT

Table of Contents

EXECUTIVE SUMMARY

This Vessel Management Plan (VMP) has been prepared by MeyGen Ltd to set out the proposed method for discharging Condition 16 of the Section 36 Consent for the Development.

The purpose of the VMP is to ensure that the Developments marine activities are conducted in a safe manner considerate of consent conditions and industry best practice. The document will be periodically reviewed during the execution of the Development to provide detailed information relevant to the key activities to be undertaken through the construction and operational phases of the Development;

I. HDD marine works

II. TSC installation

III. TSS installation

IV. TTG installation

V. Operations and Maintenance

Upon addition of above listed detailed information, the revised VMP will be reissued 3 months prior to the commencement of that phase of the Development.

The marine works must, at all times, be constructed and operated in accordance with the approved VMP. The VMP includes information relating to following details:

a) The number, types and specification of vessels required;

b) Working practices to minimise the unnecessary use of ducted propellers;

c) How vessel management will be coordinated, particularly during construction but also during operation; and

d) Location of working port(s), how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used.

The VMP presented within this document is considered sufficient to satisfy Condition 16 and enable the construction and operation of the Development to progress, subject to the NSP being implemented.

Details of vessels used to carry out any licensed activity will be notified to the Scottish Ministers in writing no later than 72 hours prior to the commencement of development.

The VMP will be submitted to the licensing authority and consulted on by SNH and any other such ecological or other advisors as may be required at the discretion of the Scottish Ministers.

THIS DOCUMENT ONLY CONSIDERS THE CONSTRUCTION WORKS. A VMP FOR THE HDD MARINE WORKS HAS BEEN APPROVED BY SCOTTISH MINISTERS (MEY-1A-40-HSE-003-VESSELMANAGEMENTPLANHDD), FURTHER VMPs FOR, OPERATIONS AND MAINTENANCE AND DECOMMISSIONING WILL BE SUBMITTED FOR CONSULTATION AND APPROVAL PRIOR TO THAT PHASE COMMENCING.

1 INTRODUCTION

The MeyGen Tidal Energy Project Phase 1 ("the Development") received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers 9th October 2013 ("the S.36 Consent"). This Vessel Management Plan (VMP) is prepared to enable Condition 14 of the S.36 Consent ("the Condition") to be discharged. Condition 14 states:

> *The Company must, no less than 3 months prior to the Commencement of the Development, submit a Vessel Management Plan, in writing, to the Scottish Ministers for their written approval, in consultation with SNH and any such other ecological or other advisors as may be required at the discretion of the Scottish Ministers. The Vessel Management Plan must include, but is not limited to, the following issues:*
>
> *a) Individual vessel details;*
>
> *b) Number of vessels;*
>
> *c) Whether ducted propellers will be in operation;*
>
> *d) How vessel management will be coordinated, particularly during construction but also during operation; and*
>
> *e) Location of working port(s), how often vessels will be required to transit between port(s) and the site and the routes used.*
>
> *The Development must be constructed and operated in accordance with the Vessel Management Plan, and the Vessel Management Plan must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the Operations and Maintenance Programme, and the Navigational Safety Plan.*
>
> *Reason: To minimise the disturbance to seal haul outs, marine mammals and basking sharks as well as consideration of mitigation measures for cork screw injuries to seals.*

This document sets out the proposed VMP that MeyGen Ltd intends to undertake, to allow the Condition to be discharged.

2 SCOPE OF VESSEL MANAGEMENT PLAN

Phase 1a of the Development is a 6MW, 4 tidal turbines initial phase to be installed and operatives under the restriction placed on the Development by Condition 2 of the S.36 Consent.

This document, as agreed with the licensing authority, covers the installation of the Phase 1a infrastructure (4 x Tidal Turbine Generators (TTG), 4 x Gravity-base Turbine Support Structures (TSS) and Turbine Subsea Cables (TSC), collectively described as "**the Construction Works**" (Figure 1).

MeyGen has produced a VMP for the HDD Marine Works (MEY-1A-40-HSE-003-F-VesselManagementPlanHDDWorks), which was consulted on and approved by Scottish

Ministers.

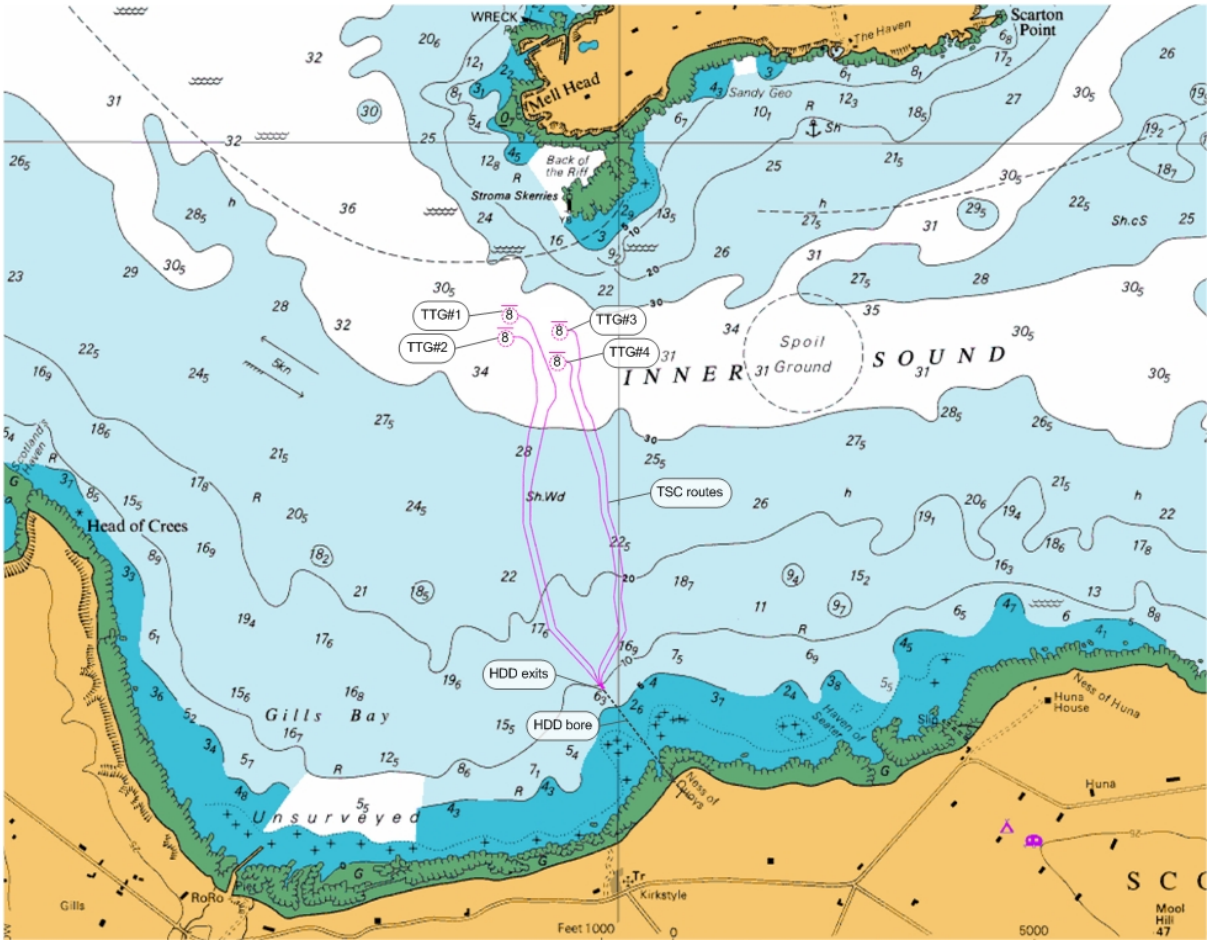

Figure 1 Construction Works Location

The VMP will apply to the Construction Works and vessels transiting between the site and associated ports.

The VMP forms part of a suite of documents related to the consent conditions that MeyGen Ltd. seek to discharge:

- Environmental Management Plan (EMP) (S.36 Consent, Condition 11) including Marine Pollution Contingency Plan (Marine Licence, Condition 3.2.13), Reporting Protocol for the Discovery of Marine Archaeology (S.36 Consent, Condition 16);
- Construction Method Statement) (S.36 Consent, Condition 9); and
- Navigation Safety Plan (NSP) (S.36 Consent, Condition 17).

The VMP is in accordance with the Environmental Statement (ES) and Supplementary Environmental Information Statement (SEIS) which identified the construction activities to have the potential to disturb/harm Grey seal and Harbour seal. The ES and SEIS mitigation measures have been detailed and documented in the EMP. The EMP commits MeyGen Ltd. to safeguarding the environment through the identification, avoidance and mitigation of the

potential negative environmental impacts associated with the development, construction and operation of the tidal array. The VMP will be an integral element of the EMP.

It is intended that this VMP will be regularly reviewed throughout the planning and development of specific marine activities and revisions approved by the Scottish Ministers in accordance with the Condition.

The document contains the following sections:

- Communications, Roles and Responsibilities;
- Environmental Sensitivities;
- Environmental Commitments;
- Vessels (numbers, types and specification);
- Vessels (working practices);
- Vessel Management and Coordination;
- Ports and Vessels;
- Linkages with Other Conditions;
- European Protected Species (EPS);
- Outline Operational VMP; and
- Consultation.

2.1 Turbine Subsea Cable (TSC) Works Summary

The installation process will pull 4 x TSC from offshore via the HDD ducts to onshore and then lay the TSC along to the seabed to the 4 x TSS locations. Full installation details can be found in the Construction Method Statement (MEY-1A-40-HSE-004-F-CMSConstructionWorks).

The installation will use:

- 1 Cable Laying Vessel (CLV); and
- 1 Multi-cat type vessel.

The key elements of the TCS installation are:

- Complete TSC route and TTG seabed survey using ROV / Drop-down camera from the multi-cat vessel prior to operations.
- Divers from a multi-cat will remove the HDD exit cap, install a bellmouth to the HDD liner and a pull the winch wire through the HDD liner.
- Mobilise the cable laying vessel (CLV);
- The TSC will be mobilised direct from the cable manufacturer (Hartlepool);
- The CLV will transit to site, position and hold station to the north of HDD exit points.

- The TSC will be paid out from the CLV, floated and directed by a multi-cat vessel towards the HDD exit point.
- The TSC will be connected to the pre-installed winch wire in HDD bore.
- An onshore winch will then begin to pull the TSC through the HDD bore as it is paid out from the CLV.
- The Multi-cat will monitor progress and release the floats attached to the TSC.
- When the TSC has reached the onshore site it will be temporarily secured.
- The cable laying vessel will then begin to lay the TSC along the design route towards the TSS locations.
- TSC is set down near the Turbine Support Structure (TSS) and laid down with a temporary dead man anchor.
- The process will be repeated for 4 x TSC.
- Cable stability measures will be marshalled from Scrabster Harbour, loaded onto a suitable DP vessel.
- Cable stability measures will be overboarded from the DP vessel crane into position determined by previous analysis
- Demobilise vessels
- The process will be repeated for 4 x TSC.

Figure 2, below, shows the TSC Works Programme.

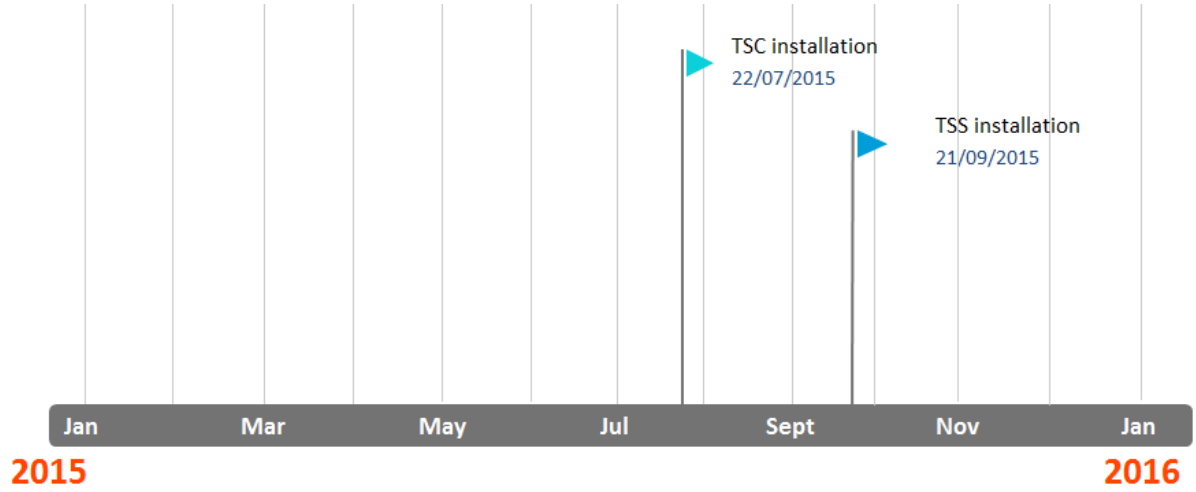

Figure 2 TSC / TSS Marine Works Programme

2.2 Turbine Support Structures (TSS) Works Summary

The TSS Works includes the installation of the 4 x TSS and ballast blocks at their target locations. Full installation details can be found in the Construction Method Statement (MEY-1A-40-HSE-004-F-CMSConstructionWorks).

The installation will use 1 Dynamic Positioning (DP) Construction Vessel.

The key elements of the TSS installation process are:

- A DP Vessel is prepared with the necessary grillages and sea fastenings.
- The 2 x TSS tripod will be loaded from Nigg Energy Park

- The DP vessel transits to site from port.
- The DP vessel waits for slack tide before moving onto DP station at the TSS location.
- The TSS is over-boarded using the vessel crane.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the TSS onto the seabed.
- Ballast blocks will be collected by the DP vessel from Scrabster Harbour.
- The DP vessel will sequentially install ballast blocks to the tripod. One per slack tide window. The DP vessel will plan and prepare for the each subsequent lift in between slack tides.
- The DP vessel then returns Nigg Energy Park to collect the final 2 TSS tripods.
- The sequence is repeated for all 4 TSS.
- Vessel is demobilised.

Figure 2 above shows the TSS Works Programme.

2.3 Tidal Turbine Generators (TTG) Works Summary

Two types of TTG will be installed during Phase 1a, 1 x Atlantis TTG and 3 x Andritz Hammerfest TTG. The installation methods are largely similar, with both involving positioning the TTG on the TSS and connecting mechanical and electrical connectors, however, some differences exist, largely related to methods of electrical connection.

The installation will use 1 DP Construction Vessel.

2.3.1 Atlantis TTG installation

The key elements of installation for the Atlantis TTG are summarised below:

- TTG and associated components and equipment are assembled at Nigg Energy Park. A DP Vessel is prepared with the necessary grillages and sea-fastening.
- TTG and equipment is loaded onto the DP vessel.
- The DP vessel transits to site from port.
- The DP vessel waits for slack tide before moving onto DP station at the TSS location.
- The end of TSC is retrieved from the seabed, and fixed to a back-pack cable management system;
- The back-pack structure is installed onto the TSS;
- The DP vessel waits for the next slack tide before the TTG is over-boarded using the vessel crane.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the TTG onto the TSS.
- In installing the TTG on the TSS the electrical connection in the back-pack is made.
- DP Vessel is demobilised.

2.3.2 Andritz Hammerfest TTG installation

The key elements of installation for the Atlantis TTG are summarised below:

- TTG with TSC tail and equipment are assembled at Scrabster Harbour.
- A DP Vessel is prepared with the necessary grillages and sea-fastening.
- TTG and equipment is loaded onto the DP vessel.
- The DP vessel transits to site from port.

- The DP vessel waits for slack tide before moving onto DP station at the TSS location.
- The TTG and TSC tail are lowered simultaneously using a tandem lift operation. The TTG is installed on the TSS.
- The end of TSC is retrieved from the seabed via an ROV,
- Both TSC and TSC tail will be clamped on deck and a dry-mate jointing operation commences.
- The connected TSC will then be laid back on the seabed
- Vessel is demobilised.
- The operation will be repeated for 3 x Andritz Hammerfest TTG.

Figure 3, below, shows the TTG Marine Works Programme.

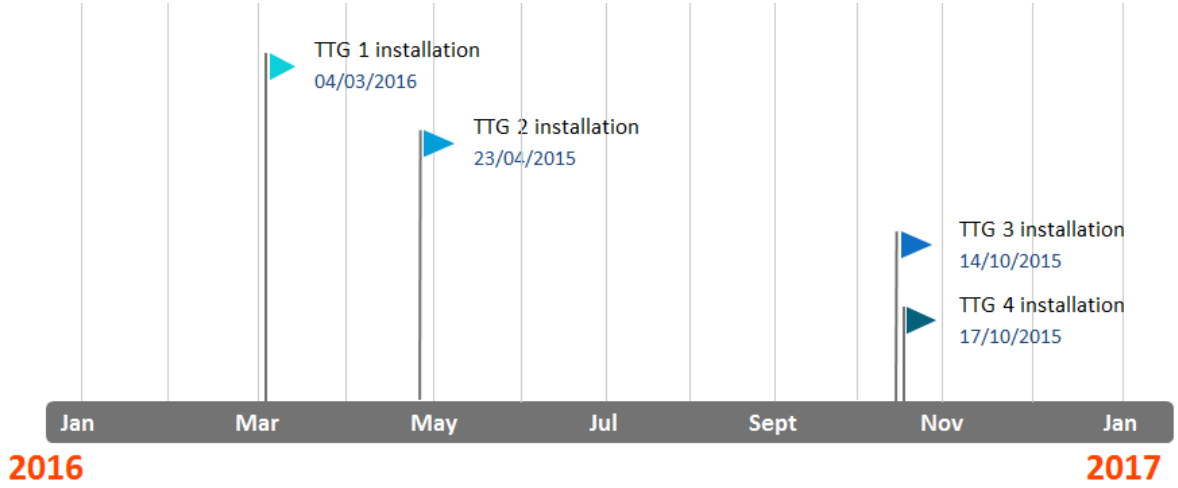

Figure 3 TTG Marine Works Programme

3 COMMUNICATIONS ROLES AND RESPONSIBILITES

This section details the project team roles, responsibilities and lines of communication during the construction and operation of the Development.

3.1 Responsibilities and Ownership

The Principal Contractor (PC) will have the ultimate responsibility for ensuring the implementation of the VMP.

The Ecological Clerk of Works (ECoW) will provide quality assurance and approval of any version of the VMP.

Any updates to the VMP by the PC will require the ECoW to check compliance with current legislation, consent conditions and related documents. Updated VMP will then be submitted to Scottish Ministers for approval.

3.2 Organisational Chart

The organisational chart for the Construction Works is below in Figure 4. This includes how communication as part of the VMP will be conducted in normal working procedures and in the case of emergencies.

The organisation chart presents the key interfaces, lines of communication and responsibilities with regards to the flow of requirements and provision of mitigating actions across the Construction Works.

Details are provided in the Table 1 below for contacts relevant to the delivery of this plan. These details may change and the VMP will be updated when necessary.

Name	Role	Organisation	Telephone	Mobile
Ian Sargent	Project Manager	James Fisher Marine Services Ltd.	+441565 658812	[redacted]
Stan Groundwater	Marine Coordinator	James Fisher Marine Services Ltd.	+441565 658824	[redacted]
Tony Blackshaw	HSE Advisor	James Fisher Marine Services Ltd.	+441565 658817	[redacted]
Ed Rollings	ECoW	MeyGen Ltd	+44131 659 9662	[redacted]
Fraser Johnson	Marine Package Manager	MeyGen Ltd	+44131 659 9672	[redacted]

Table 1 Contact Details

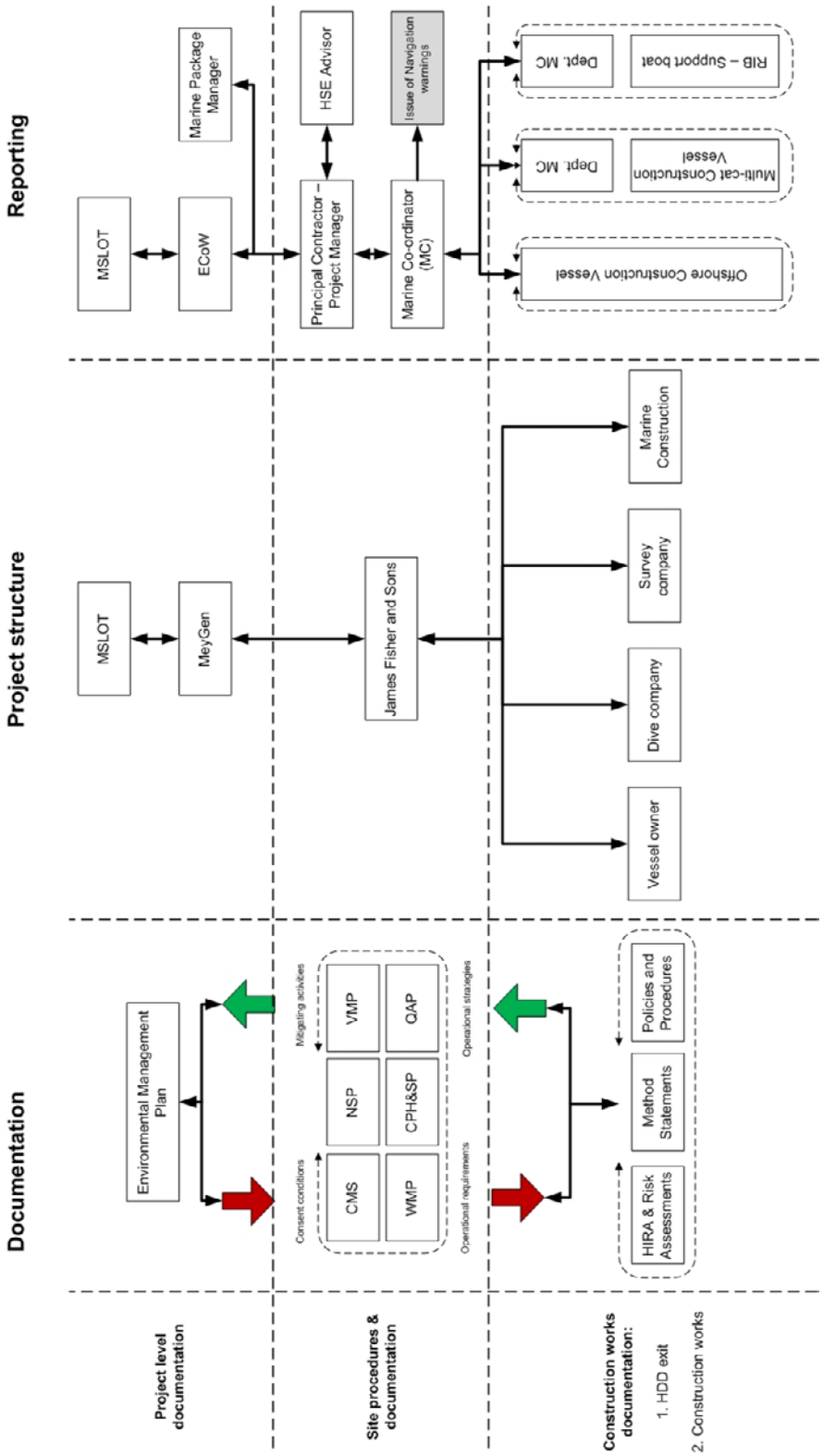

Figure 4 – Key interfaces and organisation chart

3.3 MeyGen - Ecological Clerk of Works

- Review and approve all consent related documents (S36 Condition 10).
- Review / comment on content of Site Inductions and Toolbox Talks.
- Review / comment on Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and controls.
- Inspect the site / vessel on a regular basis to ensure effective implementation/operation of all environmental mitigation measures.
- Audit PC procedures, inspections, investigation and reporting.
- Ensure compliance with approve consent related documents, environmental legislation and requirements and address any shortfalls with the PC (S36 Condition 10).
- Review environmental incidents / near misses and PC investigations
- Report compliance and incidents to the licensing authority and other necessary regulatory authorities.
- Notify the licensing authority of vessel details (ML Condition 3.1.3)
- Notify the licensing authority of the commencement date (ML Condition 3.2.1.4)
- Provide Transport Audit Sheets for works to the licensing authority (ML Condition 3.2.2.1)
- Notify the licensing authority of deposits by MHWS (ML Condition 3.2.2.2)
- Ensuring any protected species licenses are in place for the Development (S36 Condition 10)

3.4 Principal Contractor – James Fisher Marine Services Ltd.

3.4.1 Project Manager

- Facilitate dissemination of specific environmental requirements to the project team.
- Oversee the implementation and review of environmental procedures throughout the project.
- Review and approve all consent related documents, including, but exhaustive, CMS, VMP and NSP.
- Monitor the environmental performance of the project through maintaining an overview of incidents, inspections and audits.
- Ensure that environmental considerations form an integral part of Design and Implementation of the Works and to include environmental reviews as part of regular project meetings.
- Review and approve Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and mitigation.

- Ensure that all environmental incidents are reported to the ECoW and MeyGen in accordance detailed reporting requirements and the respective regulatory bodies (where required) as soon as possible.
- Review environmental matters with the ECoW and MeyGen and respective regulatory bodies on a regular basis and as per project requirements.
- Ensure that arrangements for liaison with Development respective regulatory bodies on all environmental issues is appropriate and maintained.
- Implement and maintain a project communications strategy to manage project public relations and complaints.
- Produce weekly and monthly reports and submit to MeyGen Package Manager and ECoW.
- Ensure contractors are approved, operates a Safety Management System, confirm that they are suitably qualified in their line of work and have undertaken suitable environmental training to cover tasks to be undertaken.

3.4.2 HSE Advisor

Key roles and responsibilities of the HSE Advisor include, but are not limited to the following:

- Verify compliance with relevant legislation.
- Prepare, implement, review and update consent related documents (in conjunction with the Project Management Team) in accordance with consent condition, James Fisher Marine Services procedures and current legislation.
- Advise the project team on environmental related decision making
- Review Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and mitigation.
- Approve Toolbox Talks and Site / Vessel Inductions and ensure content promotes effective environmental management, specific works and Site / Vessel sensitivities and communicate associated lessons learnt.
- Provide support to the Marine Coordinator and workforce on any environmental matters that may arise.
- Audit contractors to confirm that they are suitably qualified in their line of work and have undertaken suitable environmental training to cover tasks to be undertaken.
- Ensure suitable consideration is given to the period and frequency of environmental monitoring (particularly with respect to higher risk areas).
- Inspect and audit the site / vessels on a regular basis to ensure effective implementation / operation of any environmental mitigation measures.
- Ensure compliance with environmental requirements and address any shortfalls.
- Provide inspection reports to the project management detailing any issues that must be addressed

- Undertake investigations into environmental incidents or near misses to determine the root/direct cause and present the findings, recommendations and lessons learnt.
- Monitor hazardous observations and incidents trends in relation to environmental aspects and impacts and initiate actions as required to minimise the potential environmental impacts and reduce risk in a timely and effective manner.

3.4.3 Marine Coordinator

- Responsible for all construction operations Marine Coordination including vessel / site HSE during construction operations.
- Ensure that all contractors have received and understood the Site / Vessel induction.
- Undertake Toolbox Talks to promote effective environmental management and communicate associated lessons learnt.
- Monitor and disseminate weather information and forecasts
- Production of marine safety alerts including issuing Notice to Mariners to agreed stakeholder list.
- Responsible for collating, communicating and responding to statutory navigation notices.
- Liaise with port authorities.
- Implement / operate environmental mitigation measures as approved in the consent related documents at the site / vessel.
- Coordinating, ensuring compliance for and recording all vessel movements and personnel movements offshore.
- Emergency response coordination.
- Produce daily reports and submit to the PC Project Manager, MeyGen Package Manager and ECoW.
- Keep Transport Audit Sheets for all materials listed in the licence to be deposited as part of the works
- Keep audit reports stating the nature and quantity of all substances and objects deposited below MHWS under the authority of the licence.

3.5 Contractors

3.5.1 Vessel Master

- Overriding authority and responsibility to make decisions with respect to safe navigation of the vessel and matters related to HSE.
- Dedicated watch-keeper on board the vessel, or nominate suitable qualified deputy.
- The persons present on board must adhere to the Vessel Master's instructions.
- Adhere to IMO International Regulations for the Prevention of Collisions at Sea and UK Merchant Shipping legislation including ensuring appropriately trained and

qualified crew and personnel on board.

- Ensure that all contractors have received and understood the vessel induction.

3.5.2 All Other Staff

- To understand and implement procedures relevant to their role as laid out.
- To conduct their work with a view to eliminating/reducing the environmental impact of the Development and to raise any environmental concerns with Marine Coordinator or Project Manager.
- To report all environmental incidents to the Marine Coordinator and Vessel Master as soon as possible.

3.6 Communication

Environmental issues will be formally communicated through the arrangements on Site / Vessel in Table 2.

Meeting/briefing	Frequency	Attendees
Safety, Health, Environment, Security and Quality (SHESQ) and Progress Meeting	Weekly	See paragraph below
Daily site / vessel team briefs	Daily	All work parties
Risk Assessment/Method Statement briefings	Each job task	All members of the working party
Toolbox Talks including environmental practices and mitigation measures	Before mobilisation, or a minimum of one per week	All site / vessel personnel
Site / Vessel Induction	On first attendance at site / vessel BEFORE any work is undertaken	All persons attending site / vessel

Table 2 Communication and Meetings

3.6.1 SHESQ and Progress Meeting

The PC shall convene weekly Site / Vessel meetings with all contractors on Site / Vessel to communicate, discuss and consult any change in conditions, working practices and environmental arrangements, procedures and overall environmental performance.

The ECoW and representatives from MeyGen and other interested Third Parties shall have an open invitation to attend these weekly Site / Vessel meetings. Each contractor on Site / Vessel shall nominate a person to attend these meetings with the appropriate authority to act on those contractors behalf. SHESQ and Progress Meetings shall be augmented by additional meetings at intervals dictated by the requirements of the contract or at key stages of the works.

Minutes of all such meetings shall be produced and held on file for record purposes, with copies supplied to each contractor on Site / Vessel, the CDM Co-ordinator and ECoW.

3.6.2 Extraordinary meetings

Extraordinary meetings would be held in order to deal with special environmental issues that may arise during the project such as environmental incidents. These meetings shall be organised by the HSE Advisor with the aim of ensuring a timely response and resolution to any identified issues.

3.6.3 Daily Site / Vessel team meetings

Daily site team meetings will take place at the Onshore / Offshore site between the PC and contractors. Any environmental concern shall be addressed at this meeting.

3.6.4 Risk Assessment / Method Statement briefings

These briefings will take place before each construction task and attended by all directly involved in the task. Environmental requirements and mitigation measures will be instructed and reviewed.

3.6.5 Site / Vessel inductions

Inductions, conducted before anyone commences work on the project are utilised to raise awareness for personnel regarding Site / Vessel rules, emergency response procedures and environmental protection arrangements. The inductions include a test to confirm understanding.

3.6.6 Site notice boards

Site / Vessel notice boards will contain relevant Site / Vessel information relating to Health, Safety and Environmental issues. The Site / Vessel will also have appropriate signage in place to highlight awareness of environmental hazards. Other communications media, such as newsletters and posters will also be posted on notice boards to communicate awareness of environmental matters.

3.7 Reporting

The PC will communicate the following to the ECoW and contractors on site:

- Details of audits and inspections;
- Details and statistics for environmental incidents and near misses;
- Details of any pending and actual enforcement action in respect of any environmental incidents;
- Any other pertinent environmental issues identified;
- Transport Audit Sheets (MEY-1A-40-HSE-004-D-TransportAuditSheet) (beginning of each month); and
- Audit reports for the nature and quantity of all substances and objects deposited below MHWS (MEY-1A-70-HSE-005-D-DepositAuditSheet) (every 6 Months)
- Marine Mammal reports (MEY-1A-70-TEM_009-MarineMammalReport) (daily during marine operations)

The PC will provide these in:

- Daily logs and reports when construction activities are taking place on site / vessels;
- Weekly progress reports
- Monthly reports (additionally, confirming the status of the project, implementation of environmental commitments and mitigation measures, monthly and cumulative statistics, training delivered, environmental initiatives undertaken, amendments to the any of the consents related documents)

3.7.1 External Communication

The Marine Coordinator is responsible for:

- Documenting, issuing, communicating and responding to statutory navigation notices for the Development; and
- Emergency Response Co-operation Procedures are in place for such events. The communication and reporting protocols for such an event can be found in the Emergency Response Co-operation Plan (see NSP).

The ECoW is responsible for:

- Notification to the licensing authority detailed in the consent condition;
- Reporting monthly to the licensing authority once works have commenced with:
    - Details of audits and inspections;
    - Details and statistics for environmental incidents and near misses;
    - Details of any pending and actual enforcement action in respect of any environmental incidents;
    - Any other pertinent environmental issues identified;
    - Transport Audit Sheets; and
    - Audit reports for the nature and quantity of all substances and objects deposited below MHWS.
- Meeting with the licensing authority and statutory agencies and the local community; and
- Receiving, documenting and responding to any environmental communication from third parties.

3.8 Training

The purpose of environmental training is to ensure that all site personnel have the knowledge to successfully implement the environmental requirements of the project.

In order to ensure that the environmental mitigation measures are implemented on site, the following environmental training Table 3 in will be required.

Training	Target Persons
Induction (which will include environmental aspects such as environmental sensitivities and controls, pollution prevention, waste management, emergency preparedness and response and include shipboard operations under STCW requirements)	All persons attending Site / Vessel (Site / Vessel personnel, contractors on Site / Vessel, and visitors)
Environmental Toolbox Talks	Toolbox talks will be carried out at a minimum of one per week appropriate to the construction works being carried out on Site / Vessel at that time. All persons carrying out work on site (site personnel, contractors on site) shall attend.
Environmental Bulletins / Legislation Briefings / Best Practice Briefings	All persons carrying out work on Site / Vessel (Site / Vessel personnel, contractors on Site / Vessel) shall attend.
Job specific training e.g. • IOSH Working with Environmental Responsibilities / IOSH Managing Environmental Responsibilities. • Use of Pollution Prevention Equipment. • Site Waste Management.	As identified for personnel with environmental responsibilities
Project specific information, including relevant elements of: • the EMP, CMS, NSP, VMP • Consent Conditions	Briefed out and available for reference to all Site / Vessel staff.

Table 3 Training

Any person working on the Site / Vessel will be competent and trained sufficiently to undertake their work in a safe and efficient manner. Each Contractor will ensure that their personnel maintain the necessary level of competence for their work & will maintain the training records on site & make them available for review and audit. Records of training will be maintained and made available for inspection.

4 ENVIRONMENTAL SENSITIVITIES

Chapter 11 of the Environmental Statement, Marine Mammals, identifies harbour porpoise, grey seal and common seal as the key sensitivities during construction work.

In Scotland cetaceans (whales and dolphins) and pinnipeds (seals) are protected under a wide range of national and international legislation (full details in the EMP).

Marine mammals are considered to be potentially sensitive to the following aspects of the proposed works:

- Noise (vessel);
- Disturbance (vessel presence and movement);
- Ship strike and collision with ducted propeller; and
- Pollution and spillage

Impacts of noise, disturbance and pollution are covered under the EMP and CMS. The VMP is particularly related to mitigating the risk of vessel strike and corkscrew injuries due to ducted propellers, however the mitigation associated with the VMP goes some way to mitigating the risks of noise and physical disturbance by the vessel as well.

4.1 Ship strike and collision with ducted propellers

DP Vessels will be used for the main activities for the TSC, TSS and TTG installation, which are likely to use ducted propeller systems to maintain position (see Appendix A).

While both cetaceans and pinniped are potentially exposed to risk of ship strike and propeller strike, there has previously been significant concern regarding the risk of corkscrew injuries to seals, initially attributed to some ducted propeller system such as a Kort nozzle or some types of Azimuth thrusters, commonly used by DP vessels. The proximity of the proposed Construction Works to areas of importance for seals (protected haul out sites at Gills Bay and Stroma (Figure 5)), and the numbers of individuals present meant that this was previously a key environmental concern.

Since the submission of the ES there has been ongoing research into the issue of spiral injuries in seals which has confirmed that the characteristic wounds can be caused by a seal being drawn through ducted propeller system such as a Kort nozzle or some types of Azimuth thrusters (Thompson *et al*., 2010, Bexton *et al*., 2012; Onoufriou & Thompson, 2014). To date the observed seal strandings appear to be restricted to juvenile grey seal and female harbour seal with seasonal differences evident between the species: grey seal newly weaned pups in the winter and common seal adults or pregnant females in the summer (Brownlow, 2013).

In experimental studies (Onoufriou & Thompson, 2014) it has been shown that using a combination of propeller and seal sizes, smaller seals were more likely to show the characteristic spiral lacerations; while larger seal models often became stuck in the ducted propeller system. The results of these trials and observed stranded seals suggested, at that time, that there were still a number of uncertainties as to the frequency of occurrence, and mechanisms for this type of injury.

However, bases on the most recent known research (Thompson et al., 2015; van Neer et al., 2015) there is now very strong evidence that predatory behaviour by grey seals, rather than ducted propeller injuries, is likely to be the main cause of spiral seal deaths. Although this evidence does not completely eliminate ship propellers, it is now considered to be unlikely that they are a key factor. The SNCBs have now provided interim advice (JNCC, 2015) on this issue, an update to the earlier (April 2012) advice, in order to clarify the agreed

recommendations to regulators and industry.

This most recent advice suggests that, based on incontrovertible evidence, grey seal predation on weaned grey seal pups and young harbour seal can cause the characteristic spiral injuries that were the subject of preceding studies. The advice states that

'it is considered very likely that the use of vessels with ducted propellers may not pose any increased risk to seals over and above normal shipping activities and therefore mitigation measures and monitoring may not be necessary in this regard, although all possible care should be taken in the vicinity of major seal breeding and haul-out sites to avoid collisions'.

This new advice provides a new perspective on the preceding Statutory Nature Conservation Agency (SNCA) Guidance (2012) on the potential risk of seal corkscrew injuries, which at that time suggested levels of risk and recommendations for mitigation.

The Development is more than 60km from the nearest grey seal Special Area of Conservation (SAC, Faray and Holm of Faray), and harbour seal SAC (Sanday). The presence of the Gills Bay and Stroma haul out sites relatively close to the development site, does suggest a need for careful management of works at the site, but no direct mitigation measures are advised (SNCA, 2012).

In the light of the new, compelling scientific evidence and the revise SNCB advice, the risk of propeller collision impacts associated with the use of ducted propellers, by DP or other installation vessels, during Construction Works is considered to be low risk.

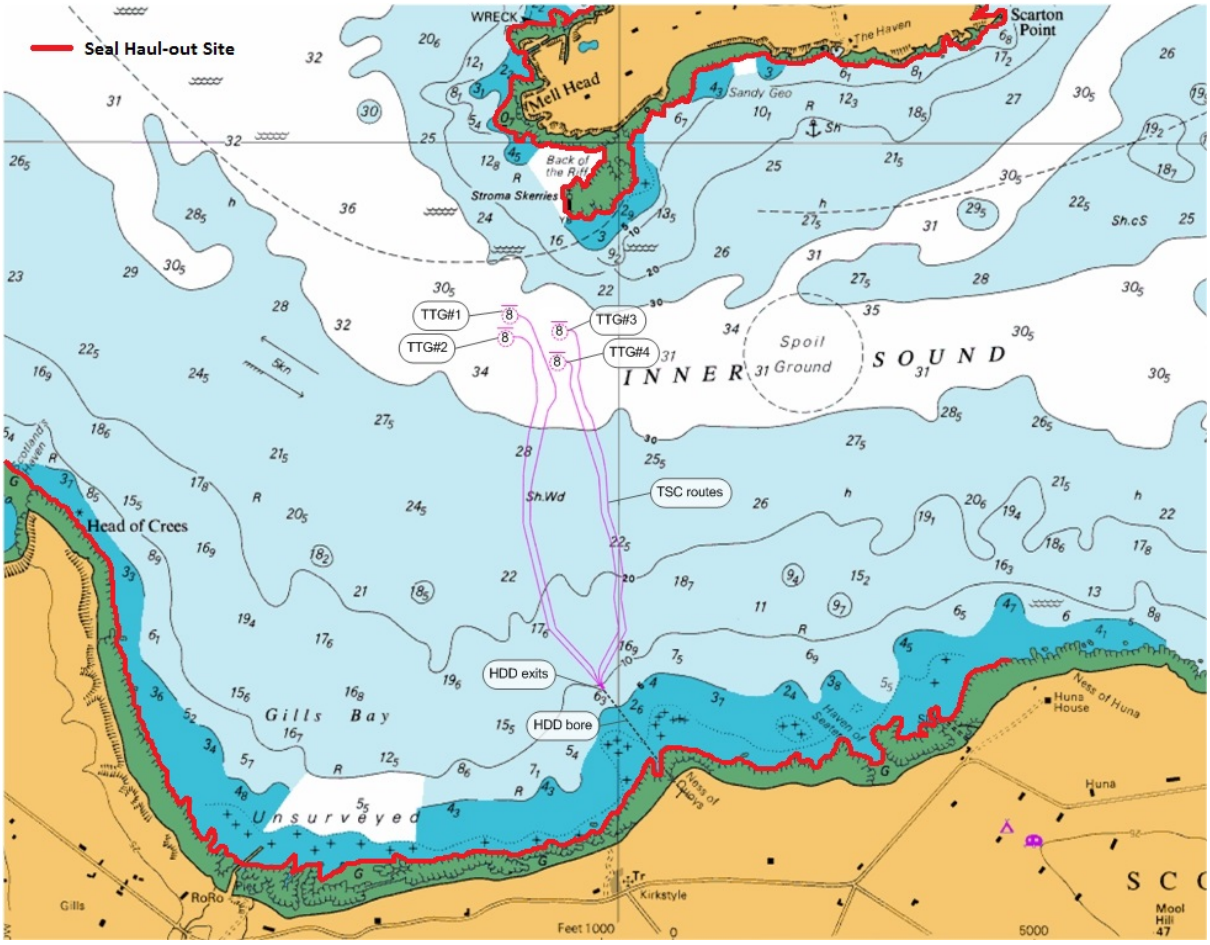

Figure 5 Location of Construction Works in relation to designated seal haul out sites

5 ENVIRONMENTAL COMMITMENTS

A list of commitments made by MeyGen in the ES, Marine Licence and Environmental Statement to mitigate the impact of vessel activity on marine mammals can be found in Table 4.

Whilst the VMP has due regard to the NSP and safe navigation and health and safety practices.

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
s36	The monitoring set out in the PEMP or, as the case may be, an amended PEMP, (which must be agreed by the Scottish Ministers, in consultation with SNH and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers), must be implemented by the Company. The Company must submit written reports of such monitoring to the Scottish Ministers at timescales to be determined by the Advisory Group. In particular, the following aspects should be considered and advice provided regarding the monitoring of the following aspects: a) Hydro dynamics / benthic surveys, export cable route and turbine locations and modelling to validate EIA predictions; b) Collision / encounter interactions with the tidal turbines for diving birds, marine mammals and fish of conservation concern; c) Disturbance and displacement of birds, marine mammals and basking sharks during construction and operation. This must also link to the species protection plan for seals at haul outs; and d) Migratory salmonids Subject to any legal restrictions regarding the treatment of the information, the results must be made publicly available by the Scottish Ministers, or by such other party appointed at their discretion.
ML	3.2.1.7 Monitoring of marine mammals Prior to the commencement of the works the licensee must agree in writing the details of the appointment of a Marine Mammal Observer (MMO) with the licensing authority. The MMO must, as a minimum, maintain a record of any sightings of marine mammals and maintain a record of the action taken to avoid any disturbance being caused to marine mammals. The licensee must provide the licensing authority with the MMO's records no later than six months following commencement of the works, and at six monthly intervals thereafter.
ES	The principles of the JNCC guidance on protection of marine European Protected Species (EPS) from injury and disturbance (JNCC, 2010) and of relevant guidelines on minimising the risk of injury to marine mammals will be adopted as necessary (for example, reducing the duration of noise emitting activities).
ES	MeyGen commit to undertaking frequent reviews of the literature regarding spiral injuries in seals and ducted propellers and to regularly discuss advances in understanding of this topic with relevant regulatory and advisory bodies. MeyGen will apply appropriate mitigation, as deemed necessary in consultation with Marine Scotland and SNH, should vessels with ducted propellers be used, to avoid any significant impacts.
ES	All vessels associated with Project operations will comply with IMO/MCA codes for prevention of oil pollution and any vessels over 400 GT will have on board SOPEPs. All vessels associated with Project operations will carry on board oil and chemical spill mop up kits. Where possible vessels with a proven track record for operating in similar conditions will be employed. Vessel activities associated with installation, operation, routine maintenance and decommissioning will occur in suitable conditions to reduce the chance of an oil spill resulting from the influence of unfavourable weather conditions.

Table 4 Marine Mammal Commitments

5.1 Legal Requirements and Licences

Licence / Consent	Legislation	Granted
Section 36 Consent	Electricity Act 1989	09/10/2013
Marine Licence (licence number 04577/14/0)	Marine (Scotland) Act 2010	31/01/2014
Decommissioning Programme	Energy Act 2005	Submitted

6 DEVELOPMENT ACTIVITIES

This section has been divided into the two main Construction Works. These sections will be completed as part of the work undertaken to fully engineer and detail the marine activities required to execute the work.

6.1 TSC Works

6.1.1 Vessels (numbers, types and specification)

The TSC installation works will require 1 x CLV and 1 x Multi-cat vessel.

Appendix A shows a typical CLV specification. The CLV will be selected closer to the installation date; the vessel specification will be submitted to MSLOT when confirmed.

Appendix A shows a typical Multi-cat vessel specification. The Multi-cat will be selected closer to the installation date; the vessel specification will be submitted to MSLOT when confirmed.

6.1.2 Operational Health and Safety

The works undertaken will be controlled and managed within the procedures detailed in the:

I. Vessel integrated safety management system

II. Specific scopes of work that outline method statements for the work to be executed, including:

    a. Emergency Response Planning for:

        i. Environmental Response (including Marine Pollution Contingency Plan – EMP)

        ii. Man Overboard

        iii. Personnel Injury or medical evaluation

6.1.3 Vessels Working Practices

Vessels specific documents will be produced when the vessel is selected.

6.1.4 Environmental Working Practices

With regard to the EMP and details in Section 4.1, a dedicated Seal Corkscrew Injury Monitoring Scheme (SCIMS) following the SNCA (2012) guidance is not considered necessary for the Construction Works. However, a number of measures are proposed by MeyGen to encourage best practice and minimise any potential (however small) risk of vessel collisions. These measures include:

- The spatial separation of at least 300m of the Construction Works (HDD exit) from MLWS of the nearest known sensitive areas for seals, the designated haul out site at Gills Bay (Figure 5), see CMS;
- During the cable laying works, when working at the HDD exit site (the closest point to the designated haul out site) the multi-cat will use an anchor spread to maintain the position on site, minimises propulsion use and vessel movement on site.
- The CLV will hold station a minimum of 50m away from the HDD exit when paying out the TSC to the HDD bore.
- The TSS/TTG positions are 300m from any designated haul out sites; all DP Vessel operations will take place in the vicinity of these locations. When waiting for slack tide windows vessels will wait in areas where a 500m separation distance can be maintained from any sensitive seal haul-out sites.
- The proposed vessel transit routes to all Construction Works ensure that the vessels keep an adequate separation distance from any sensitive seal haul-out sites wherever possible, see VMP.
- Training of all on site / on vessel personnel regarding the importance and sensitivity of marine mammals and their legislative protection;
- Provision of advice to staff detailing the types of activity potentially disturbing, and therefore to be avoided; and
- Maintenance of a daily marine mammal log (APPENDIX B) by the Principal Contractor, into which any interaction will be noted. It is important to make clear that such a log is likely to record many approaches by marine mammals to the vessels and personnel undertaking Construction Works. Marine mammals are intelligent and naturally curious about any in water construction works, regularly approaching vessels engaged in Construction Works.

6.2 TSS / TTG Installation Works

6.2.1 Vessels (numbers, types and specification)

The TSS and TTG installation works will require 1 x DP vessel.

Appendix A shows a typical DP Vessel. The DP vessel will be selected closer to the installation date; the vessel specification will be submitted to MSLOT when confirmed.

6.2.2 Operational Health and Safety

The works undertaken will be controlled and managed within the procedures detailed in the:

I. Vessel integrated safety management system

II. Specific scopes of work that outline method statements for the work to be executed, including:

a. Emergency Response Planning for:

i. Environmental Response (including Marine Pollution Contingency Plan – EMP)

ii. Man Overboard

iii. Personnel Injury or medical evaluation

6.2.3 Vessels Working Practices

Vessels specific documents will be produced when the vessel is selected.

6.2.4 Environmental Working Practices

With regard to the EMP and details in Section 4.1, a dedicated Seal Corkscrew Injury Monitoring Scheme (SCIMS) following the SNCA (2012) guidance is not considered necessary for the Construction Works. However, a number of measures are proposed by MeyGen to encourage best practice and minimise any potential (however small) risk of vessel collisions. These measures include:

- The spatial separation of at least 300m of the Construction Works (HDD exit) from MLWS of the nearest known sensitive areas for seals, the designated haul out site at Gills Bay (Figure 5), see CMS;
- During the cable laying works, when working at the HDD exit site (the closest point to the designated haul out site) the multi-cat will use an anchor spread to maintain the position on site, minimises propulsion use and vessel movement on site.
- The CLV will hold station a minimum of 50m away from the HDD exit when paying out the TSC to the HDD bore.
- The TSS/TTG positions are 300m from any designated haul out sites; all DP Vessel operations will take place in the vicinity of these locations. When waiting for slack tide windows vessels will wait in areas where a 500m separation distance can be maintained from any sensitive seal haul-out sites.
- The proposed vessel transit routes to all Construction Works ensure that the vessels keep an adequate separation distance from any sensitive seal haul-out sites wherever possible, see VMP.
- Training of all on site / on vessel personnel regarding the importance and sensitivity of marine mammals and their legislative protection;
- Provision of advice to staff detailing the types of activity potentially disturbing, and therefore to be avoided; and
- Maintenance of a daily marine mammal log (APPENDIX B) by the Principal Contractor, into which any interaction will be noted. It is important to make clear that such a log is likely to record many approaches by marine mammals to the vessels and personnel undertaking Construction Works. Marine mammals are intelligent and

naturally curious about any in water construction works, regularly approaching vessels engaged in Construction Works.

7 VESSEL MANAGEMENT AND COORDINATION

Due to the limited number of vessels being used for the works, vessel management and co-ordination will be undertaken by the Marine Co-ordinator who will be located onshore with access to AIS and radio communications.

8 PORTS AND VESSELS

Where navigation permits vessels will maintain a suitable distance from identified seal haul-out sites during transits. These sites will be specified by the ECoW and issued to vessel crews as Master Standing Orders.

8.1 TSC Installation

8.1.1 Location of Working Port(s)

The Multi-cat vessel will be able to use to Gills Bay / John o' Groats Harbour between diving operations if it is necessary (Figure 6).

The CLV will use Scrabster if required for downtime. Indicative transit route is shown in Figure 7.

8.1.2 Mobilisation Transit Routes

The CLV will transit to site during mobilisation and demobilsation from Hartlepool. All 4 TSC will be transported at the same time so it is not anticipated that repeat mobilisations will be required (Figure 8)

The Multi-cat vessel will transit to and from the site during mobilisation and demobilisation from Stromness (Figure 6).

8.1.3 Frequency of Vessel Movement

The programme and methods used for the TSC Installation Works is supplied in the CMS.

The CLV will mobilise from Hartlepool will all 4 TSC on board. Each TSC is programmed to take approximately 30 hours of continuous operation. The VSC will use Scrabster Harbour as a safe haven if required between TSC laying activities.

The Multi-cat vessel will be mobilised for the same period as the CLV. The multi-cat will use Gills Bay if required between TSC laying activities.

8.1.4 Vessel holding areas

The TSC installation is a continuous activity and therefore will not start unless the correct conditions for the length of the operation are forecast.

The multicat vessel will be able to use Gills Bay as a holding area should it require. For delays of longer than 12 hours it is likely that the vessel will return to its home port if weather permits.

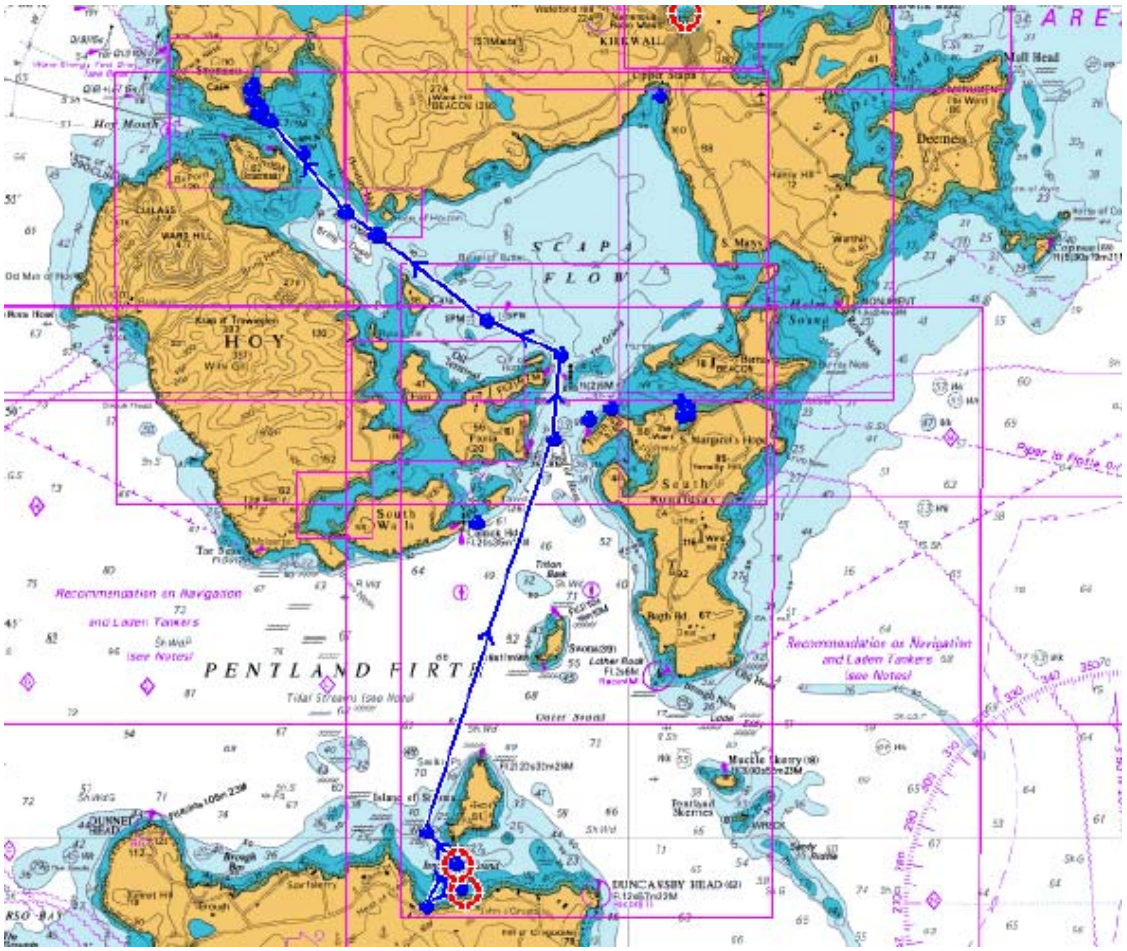

Figure 6 – Transit route between vessel Stromness and the Construction Works site

Figure 7 Vessel route from Scrabster to the Construction Site

Figure 8 TSC Vessel route from Hartlepool to Construction Site

8.2 TSS / TTG Installation

8.2.1 Location of Working Port(s)

TSS and TTG installation will be carried out from Scrabster Harbour (Figure 7) and Nigg Shipyard (Figure 9).

8.2.2 Mobilisation Transit Routes

Typical transit routes from Scrabster Harbour (Figure 7) and Nigg Shipyard (Figure 9).

8.2.3 Frequency of Vessel Movement

The programme and methods used for the TSC Installation Works is supplied in the CMS.

For the TSS installation, 2 x TSS tripod substructure will be mobilised from Nigg Shipyard, therefore 2 mobilisations are required for the 4 x tripod substructures. The ballast blocks will be mobilised by the same vessel from Scrabster Harbour. It is anticipated that the DP vessel will collect 3 ballast blocks per operation, therefore it will require 8 transits to complete the operatio for 4 x TSS.

8.2.4 Vessel holding areas

The DP vessel will use sheltered areas away from the TSS and TTG locations whilst waiting for the next slack tide window. The DP vessel operator will decide on these areas when a full assessment has been carried out. These areas will be at least 500m away from the nearest sensitive sea haul-out site.

In prolonged bad weather the DP vessel will use Scrabster Harbour as a safe haven.

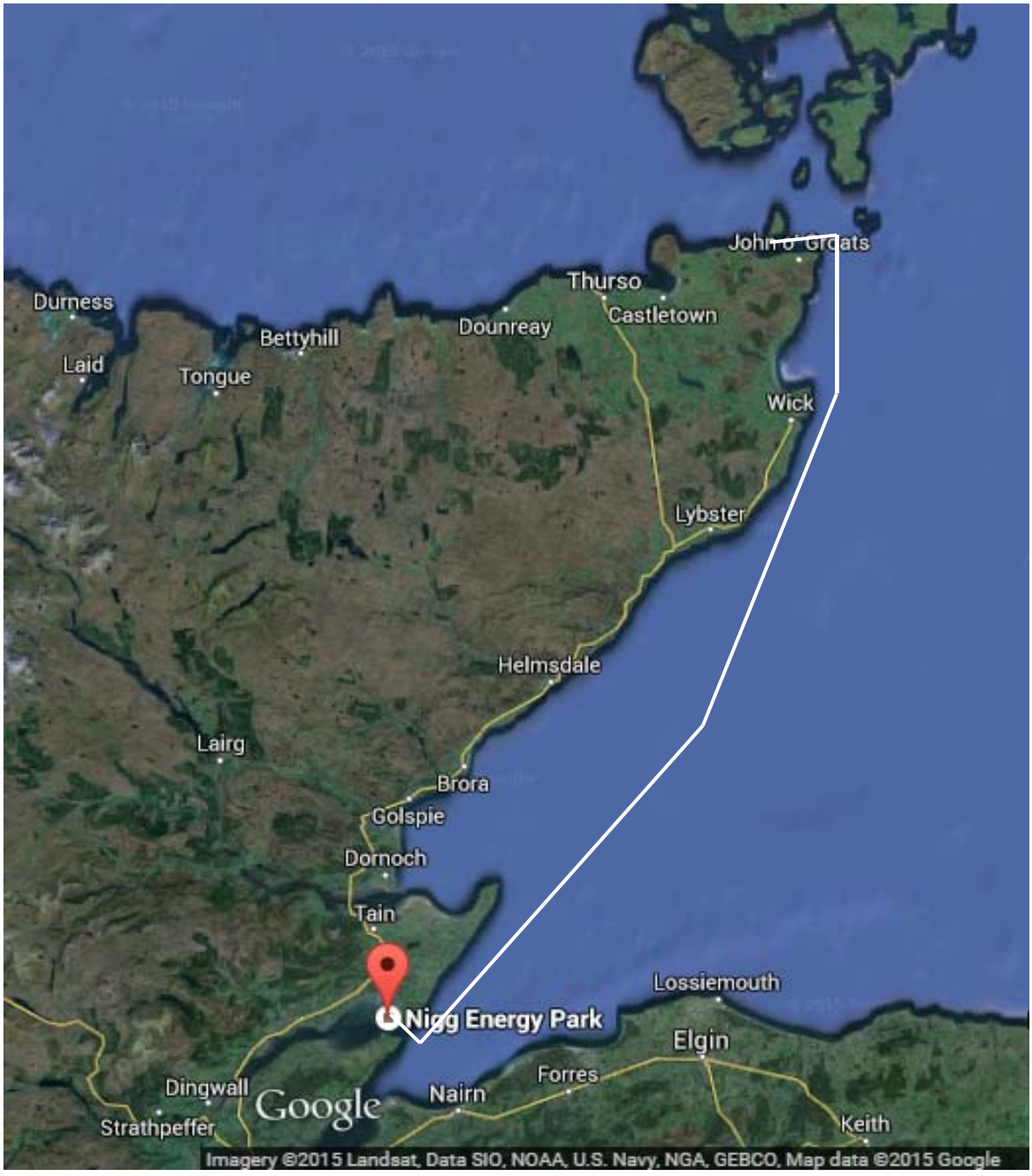

Figure 9 TTG / TSS Vessel route from Nigg Energy Park to Construction Site

9 LINKAGES WITH OTHER CONDITIONS

The VMP is part of suite of consent related documents. Table 5 of documents and related conditions are relevant to the VMP. A full list of the S36 and Marine Licence conditions is in the EMP.

Con	Condition summary	Document	Responsible for Notification
S36 9	-	Construction Method Statement	
S36 10	ECoW	N/A	
S36 11	-	Environmental Management Plan	
S36 12	-	Project Environmental Monitoring Programme	
S36 13	-	Advisory Group	
S36 14	-	Vessel Management Plan	
S36 15	-	Operations and Maintenance Plan	
S36 16	Reporting Protocol for the Discovery of Marine Archaeology	Environmental Management Plan	
S36 17	-	Navigation Safety Plan	
ML 3.1.3	Notification of Vessels	Construction Method Statement / Vessel Management Plan	ECoW
ML 3.2.1.3	Marine Pollution Contingency Plan	Environmental Management Plan	
ML 3.2.1.4	Notification of Commencement	Construction Method Statement	ECoW
ML 3.2.1.5	ECoW	N/A	
ML 3.2.1.6	Promulgation of navigation warnings	Navigation Safety Plan	
ML 3.2.1.7	Marine Mammal Observer	Environmental Management Plan	
ML 3.2.1.8	Cable Installation Plan	Construction Method Statement	

ML 3.2.1.9	Cable Protection Plan	Construction Method Statement	
ML 3.2.2.1	Transport Audit Sheets	Construction Method Statement	ECoW
ML 3.2.2.2	Notification of Deposits	Construction Method Statement	ECoW

Table 5 Other relevant conditions

10 EUROPEAN PROTECTED SPECIES

As detailed in the EMP, no EPS licence is required for the Construction Works.

11 OPERATIONAL VMP (TBC)

11.1 Vessels (numbers, types and specification)

11.2 Vessels (working practices)

11.3 Vessel Management and Coordination

11.4 Ports and Vessels

12 VMP REVIEW AND CONSULTATION

Under Condition 14 of the Section 36 the VMP will be reviewed and commented on by the licensing authority, SNH, and any other such ecological or other advisors that may be required at the discretion of the Scottish Ministers. The VMP must be approved by the licensing authority.

The VMP will be submitted to the licensing authority for distribution to the stakeholders and for approval.

Subsequent versions of the VMP will be submitted for the Construction Works to include procedures for turbine, foundation and cable installation.

Any changes to the VMP deemed necessary (working methods or procedures) must be reviewed and approved by the ECoW before it is submitted for approval to the licensing authority (Figure 10).

Version control will be conducted by the revision review block on the front page of the CMS.

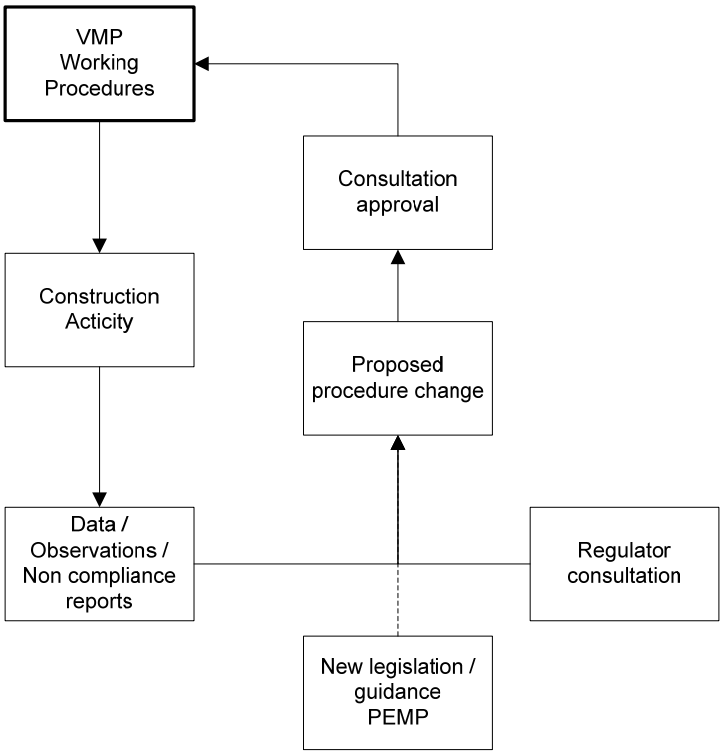

Figure 10 VMP Change Process

13 REFERENCES

Bexton, S., Thompson, D., Brownlow, A., Barley, J., Milne, R. and Bidewell, C. (2012). Unusual mortality of pinnipeds in the United Kingdom associated with helical (corkscrew) injuries of anthropogenic origin. Aquatic Mammals 38:229-240.

Brownlow, A. (2013). Spiralling trauma? Describing a novel form of pinniped mortality in the United Kingdom. Presentation at the 27th Conference of the European Cetacean Society. Setubal Portugal April 2013.

JNCC. 2015. Interim advice on risk of seal corkscrew injuries. Staff briefing note.

Lucke, K., Siebert, U., Lepper, P. A. & Blanchet, M-A (2009). Temporary shift in masked hearing thresholds in a harbour porpoise (Phocoena phocoena) after exposure to seismic airgun stimuli. Journal of the Acoustical Society of America. 125(6), 4060-4070.

Onoufriou, J. & Thompson, D. 2014. Testing the hypothetical link between shipping and unexplained seal deaths: Final report. Marine Scotland Marine Mammal Scientific Support Research Programme MMSS/001/11, Task USD2.

Statutory Nature Conservation Agencies (2012). Guidance for staff advising on the potential risk of seal corkscrew injuries April 2012.

Thompson et al., 2015. Preliminary report on predation by adult grey seals on grey seal pups as a possible explanation for corkscrew injury patterns seen in the unexplained seal deaths.

Sea mammal research unit report to the Scottish Government 12/01/15 0.1. Marine mammal scientific support research programme MMS/001/11. Project report USD 1&6 supplement.

Thompson, D., Bexton, S., Brownlow, A., Wood, D., Patterson, T., Pye, K., Lonergan, M and Milne, R. (2010). Report on recent seal mortalities in UK waters caused by extensive lacerations. Sea Mammal Research Unit report. Available online - http://www.smru.st-and.ac.uk/documents/366.pdf [Accessed 05/08/2013]

Van Neer et al., 2015. Grey seal (*Halichoerus grypus*) predation on harbour seals (*Phoca vitulina*) on the island of Helgoland, Germany. Journal of Sea Research, 97; 1-4.

14 LIST OF ABBREVIATIONS

Abbreviation	
CDM	Construction (Design and Management) Regulations 2007
CMS	Construction Method Statement
COSHH	Control of Substance Hazardous to Health
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERCoP	Emergency Response Co-operation Plan
ERP	Emergency Response Procedures
EPS	Europena Protected Species
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
IOSH	Institute of Occupational Safety and Health
JNCC	Joint Nature Conservation Committee
NSP	Navigation Safety Plan
MCA	Maritime and Coastguard Agency
MHWS	Mean High Water Springs
ML	Marine Licence under the Marine (Sotland) Act 2010
MLWS	Mean Low Water Springs
MMO	Marine Mammal Observer
PC	Principal Contractor – James Fisher Marine Services Ltd.

PEMP	Project Environmental Monitoring Programme
RAMS	Risk Assessments and Method Statements
SAC	Special Area of Conservation
SCIMS	Seal Corkscrew Injury Monitoring Scheme
SEIS	Supplementary Environmental Information Statement
SEPA	Scottish Environment Protection Agency
SHESQ	Safety, Health, Environment, Security and Quality
SNCA	Statutory Nature Conservation Agency
SNH	Scottish Natural Heritage
SPA	Special Protected Area
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
S36	Section 36 of the Electricity Act 1989
TSC	Turbine Submarine Cable
TSS	Turbine Support Structure
TTG	Tidal Turbine Generator
VMP	Vessel Management Plan

APPENDIX A - VESSEL PARTICULARS

LEASK MARINE

M.V. C-Odyssey

General

Type of vessel	Multiworker Twenty6
Year built	2011
Category	MCA Cat 1 Up to 150 miles from safe haven
Basic functions	Marine renewables support vessel Dive support Towage Anchor handling Fuel and water transfer
Passengers	12 plus crew

Dimensions

Length	26m
Beam	10.5m
Depth	3.5m
Draught	2.5m

Tank Capabilities

Fuel/oil	100m³
Black/grey water	9m³
Fresh water	45m³
Dirty oil	0.9m³
Ballast water	88m³

Accommodation

Cabins	2 off twin berth 2 off single berth
Large mess room, galley and laundry	

Propulsion System

Main engines	2 x caterpillar C32
Total power	2,400bhp at 1,800 rpm
Propulsion	2x fixed pitch propellers in nozzles 1,500mm

Generators

1 off 78 KVA
1 off 35 KVA

Performance

Bollard pull	27 tons
Speed	10 knots

Deck Equipment

Towing winch	60ton
Anchor handling	60 ton
(combined lift)	120 ton
Tugger winch	3 x 15 ton
Towing hook	SWL25 ton
Capstan	5 ton
Bow roller	5,000mm SWL 120 ton
Aft roller	3,000mm SWL 60 ton
Deck carrying capacity	100 ton
Deck crane (forward)	Hs 185t/m 7000kg@18.5m
Deck crane (aft)	Hs 60t/m 4630kg@10m

Crowness Park, Hatston Industrial Estate, Kirkwall, Orkney, KW15 1GF
W: www.leaskmarine.com | E: Douglas@leaskmarine.com
T/F: +44 (0) 1856 874 725 | [redacted]

Making Marine Renewables Work

Registered in Scotland. No SC292116
Registered address, Carradale, Weyland Bay, Kirkwall, Orkney KW15 1TD

Members of
The Association
of Diving Contractors

LEASK MARINE

M.V. C-Salvor (ex Multrasalvor)

General

Type of vessel	Damen Dredge Helper
Year built	1994
Category	MCA Cat 2 Up to 60 miles from safe haven
Basic functions	Marine renewables support vessel Dive support Towage Anchor handling Fuel and water transfer
Passengers	12

Dimensions

Length	23.3m
Beam	9.5m
Depth	2.75m
Draught	2.3m

Tank Capabilities

Fuel oil	66m^3
Fresh water	45m^3
Lubrication oil	0.75m^3
Dirty / bilge oil	7.5m^3

Propulsion System

Main Engines	2 x Cummins KTA 19 M2
Total Power	864 kW
Propulsion	2 x Promarin fixed propeller

Generators

1 off 86 kW at 1500 rpm
1 off 41 kW at 1500 rpm

Performance

Bollard pull	16.4 tons
Speed	8.9 knots

Deck Equipment

Winch	Hydraulic anchor handling / towing winch EMCE 2.3523, SWL 40.0 tons
Wire Capacity	300m, 32 mm
Tugger winches	3 x 12 ton Hydraulic mooring winches
Deck capacity	50 ton
Stern roller	SR 2490
Deck crane	26 tons/5.65 m, 10 tons/12.25
Towing hook	Mampaey WLL 17 tons
Spare towing wire	300m, 32 mm

Accommodation

Cabins	2 off twin berth

Crowness Park, Hatston Industrial Estate, Kirkwall, Orkney, KW15 1GF
W: www.leaskmarine.com | E: Douglas@leaskmarine.com
T/F: +44 (0) 1856 874 725 | M: [redacted]

Making Marine Renewables Work

Registered in Scotland. No SC292116
Registered address, Carradale, Weyland Bay, Kirkwall, Orkney KW15 1TD

Members of
The Association
of Diving Contractors

Skandi Seven

7

Type:
Construction / Flexlay

Classification:
DNV, +1A1, SF, EO, DYNPOS AUTRO DK+, Comf-V(3)C(3), HELDK NAUT-AW, CRANE, ICE-C, CLEAN

The *Skandi Seven* is a construction / flexlay vessel capable of operating in water depths up to 3,000m. Equipped with a vertical lay system* for deployment of flexible products, with a top-tension capacity of 110t and twin workclass ROVs.

- Length 121m x breadth 23m
- Deck area 1,300m²
- Heave compensated 250t crane
- Provision is also available for 300t reels on deck or 18m diameter carousel
- Single enclosed ROV hanger for side launched and moonpool launched ROV systems

seabed-to-surface

Skandi Seven

General Information

Classification	DNV, +1A1, SF, EO, DYNPOS AUTRO DK+, Comf-V(3)C(3), HELDK NAUT-AW, CRANE, ICE-C, CLEAN
Built	Aker Yards Sovliknes, Norway 2008
Flag State Authority	Isle of Man
Port of Registry	Douglas

Dimensions

Overall Length	120.70m
Breadth	23m
Depth	9m
Draught (summer)	6m
Draught (max)	7m
Deadweight	5,500t

Dynamic Positioning Systems

DP Classification	DYNPOS AUTRO (Class III)
ERN Rating	99.99.99

Tank Capacities (100%)

Fuel Oil	1,930m³
Fresh Water	1,060m³
Ballast Water	3,700m³

Cargo Deck

Deck Area (clear)	1,300m²
Deck Strength	10t/m²

Deck Cranes

The vessel is fitted with an active heave compensated offshore pedestal crane with the following main capacities:

Main Deck Crane	250t at 14m (harbour lift) 250t at 12m (subsea lift) 230t at 13m (ahc subsea lift) 190t at 12m (subsea lift at 2,500m)

In addition the vessel is fitted with two auxiliary knuckle boom cranes, each with a capacity of 3t at 15m.

Pipelay Systems

Provision is also available for five 300t reels on deck. 3 x 300t reels or a 18m diameter carousel. A vertical lay system* (110t capacity) is permanently installed for deployment of a range of flexible products. The carousel can stow products from 100mm to 600mm diameter with the tensioner allowing a minimum of 50mm.

ROV Systems

The vessel has a single enclosed ROV hanger with ROV doors on the port and starboard sides and after end. A moonpool and a side door launch system are provided for ROV operations.

The vessel is fitted with an ROV moonpool (5.6m x 5.5m) with baffle zones in order to provide optimised sea damping capabilities.

ROV Moonpool	5.6m x 5.5m
Work Moonpool	7.2m x 7.2m

Accommodation

120 persons

Helideck

The vessel is fitted with an approved and certified helideck. The helideck has a D-value of 21 and is approved for Sikhorsky S92 helicopters.

Communications

The vessel is fitted with a VSAT communications system.

* Subsea 7's use of the Vertical Lay System (VLS) is under license from Technip

subsea 7