FIVE ESTUARIES OFFSHORE WIND FARM

VOLUME 9, REPORT 20: OUTLINE NAVIGATION INSTALLATION PLAN

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DEFINITION OF ACRONYMS

Term	Definition
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
dML	Deemed Marine Licence
DCO	Development Consent Order
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
ES	Environmental Statement
FSA	Formal Safety Assessment
HAZOP	Hazard and Operability
HHA	Harwich Haven Authority
m	Metre
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
nm	Nautical Mile
NIP	Navigational Installation Plan
NRA	Navigational Risk Assessment
OREI	Offshore Renewable Energy Installation
PEIR	Preliminary Environmental Information Report
PLA	Port of London Authority
PLGR	Pre Lay Grapnel Run
RAM	Restricted Ability to Manoeuvre
SIMOPS	Simultaneous Operations
UK	United Kingdom
UXO	Unexploded Ordnance
VE OWFL	Five Estuaries Offshore Wind Farm Limited
VTS	Vessel Traffic Service

GLOSSARY OF TERMS

Term	Definition
Collision	The act or process of colliding (crashing) between two moving objects.
Embedded mitigation	A commitment made by Five Estuaries Offshore Wind Farm Limited (VE OWFL) to reduce and/ or eliminate the potential for significant risks.
Environmental Statement (ES)	A document reporting the findings of the Environmental Impact Assessment (EIA) and produced in accordance with the EIA Directive as transposed into United Kingdom (UK) law by the EIA Regulations.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
Impact	A potential threat to human life, health, property, or the environment.
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA) which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Navigational Risk Assessment (NRA)	A document which assesses the overall impact to shipping and navigation of a proposed Offshore Renewable Energy Installation (OREI) based upon Formal Risk Assessment (FSA).
Offshore Renewable Energy Installation (OREI)	As defined by Marine Guidance Note (MGN) 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency (MCA), 2021). For the purposes of this report and in keeping with the consistency of the Environmental Impact Assessment, OREI can mean offshore wind turbines and the associated electrical infrastructure such as offshore substations.
Significance of effect	The combination of frequency of occurrence and severity of consequence of an impact.
Vessel Traffic Service (VTS)	A service implemented by a Competent Authority designed to improve the safety and efficiency of vessel traffic and to protect the environment. The

Term	Definition
	service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area.

1 PURPOSE

1.1.1 During consultation relating to the Navigational Risk Assessment (NRA) (see Volume 9, Report 10: Navigational Risk Assessment), it was agreed with Interested Parties (as referenced in Section 2.5) that a mechanism is required for managing interactions between project vessels associated with export cable installation/ maintenance/ repair and third-party vessels in navigationally sensitive areas.

1.1.2 This outline Navigation Installation Plan (NIP) serves as such a mechanism and is considered an embedded mitigation for minimising the significance of effect associated with shipping and navigation impacts, including vessel displacement and increased collision risk, third-party with project vessel collision risk, reduced access to local ports and harbours including pilotage operations, and reduction in under keel clearance.

1.1.3 The NIP does not consider general vessel management associated with VE, e.g., entry and exit points for project vessels to/ from the array areas, since this will be managed by VE's marine coordination which will be addressed post consent as per Volume 6, Part 2, Chapter 9: Shipping and Navigation.

1.2 UPDATES TO THE NAVIGATION INSTALLATION PLAN

1.2.1 The NIP will be updated post consent as additional information relating to the design of VE is available and will continue to be updated as necessary until export cable installation is complete. Further details relating to updates to the NIP are provided in Section 2.6.

1.2.2 For the moment, where further information will be added to the tables, "TBC" has been added.

2 EXTENT OF THE NAVIGATION INSTALLATION PLAN

2.1 SPATIAL EXTENT

2.1.1 This NIP relates to a portion of the offshore export cable corridor (ECC) and the sea area surrounding it. In particular, the area covered by the Sunk Inner and Sunk Outer Precautionary Areas is considered in this NIP. This aligns with feedback received during consultation for the NRA which indicated that concerns relating to the presence of project vessels and related activities were largely associated with navigation within the Sunk including use of the Sunk pilot boarding station, recommended deep water routes, and the Harwich Deep Water Channel.

2.1.2 The area of interest for the NIP is presented in Figure 2.1 and corresponding coordinates are outlined in Table 2.1.

Table 2.1: Coordinates of area of interest for NIP.

Point	Latitude	Longitude
A	51° 53’ 03.03” N	001° 30’ 47.85” E
B	51° 53’ 03.03” N	001° 49’ 19.81” E
C	51° 45’ 52.56” N	001° 30’ 47.85” E
D	51° 45’ 52.56” N	001° 49’ 19.81” E

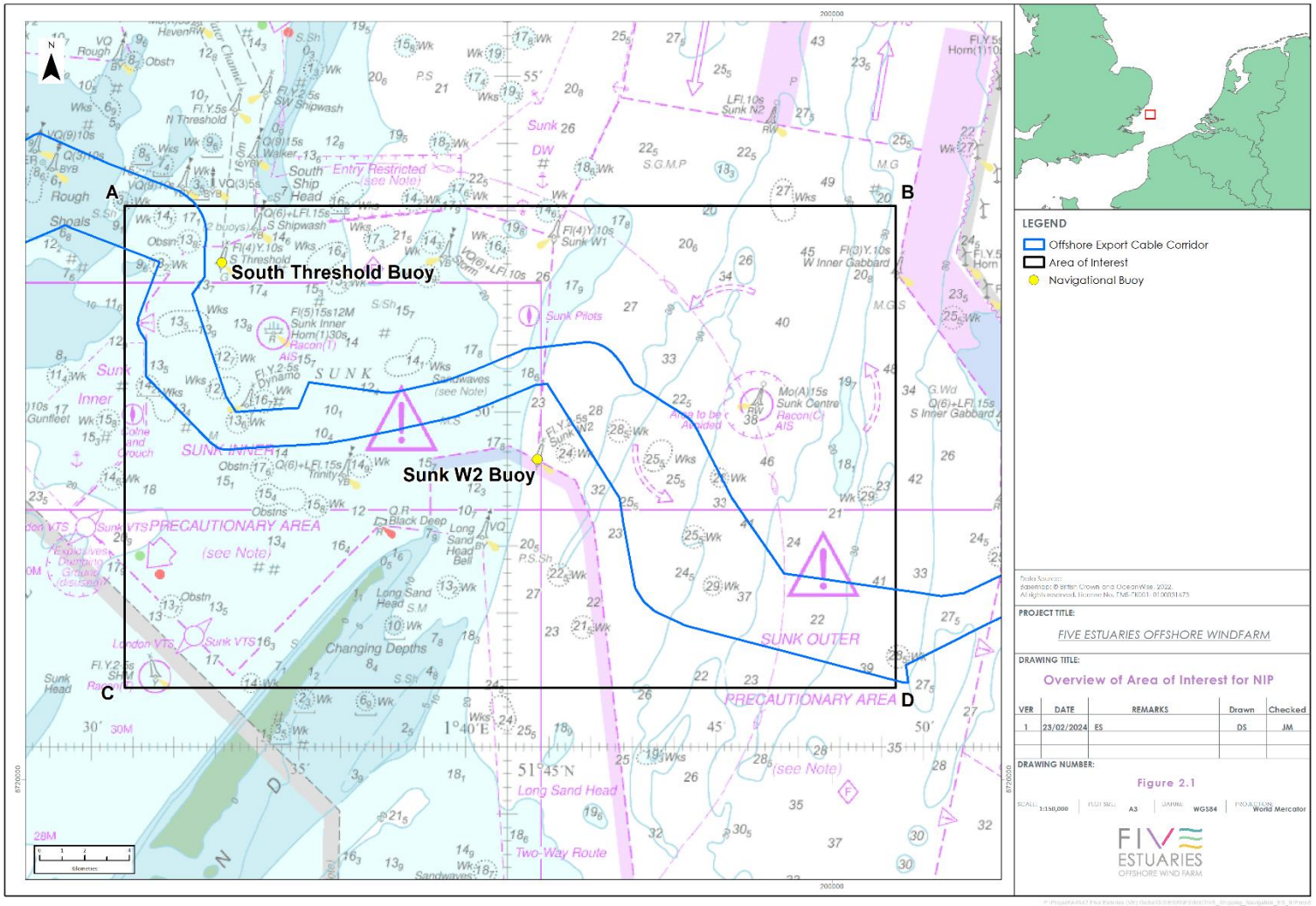

Figure 2.1: Overview of area of interest for NIP.

2.2 VESSEL MOVEMENTS AND ACTIVITIES

PROJECT VESSELS

2.2.1 Installation and maintenance activities considered in this NIP include:

- Pre and post surveys;
- Unexploded Ordnance (UXO) clearance;
- Pre Lay Grapnel Run (PLGR)/ boulder clearance;
- Sandwave clearance;
- Cable lay/ burial; and
- Cable repairs/ reburial.

2.2.2 Concurrent simultaneous operations (SIMOPS) across these activities may occur but will be managed through the protocols outlined in Section 4.

THIRD-PARTY VESSELS

2.2.3 The NIP is relevant to all third-party vessel activities within the area of interest, but with particular emphasis on:

- Deep draught vessels accessing local ports via the recommended deep water routes within the Sunk Inner Precautionary Area;
- Pilotage activities undertaken by the Harwich Haven Authority (HHA) including the boarding and landing of London and Medway pilots; and
- Other port related third-party vessels/ activities including spot dredging.

2.2.4 Further details relating to the baseline activities will be added in a future version of the NIP.

2.3 TEMPORAL EXTENT

2.3.1 The NIP will apply from the start of offshore construction activities and associated works for the export cables within the area of interest. The indicative programme of offshore construction activities is presented in Figure 2.2 and includes site preparation works as outlined in Section 2.2.

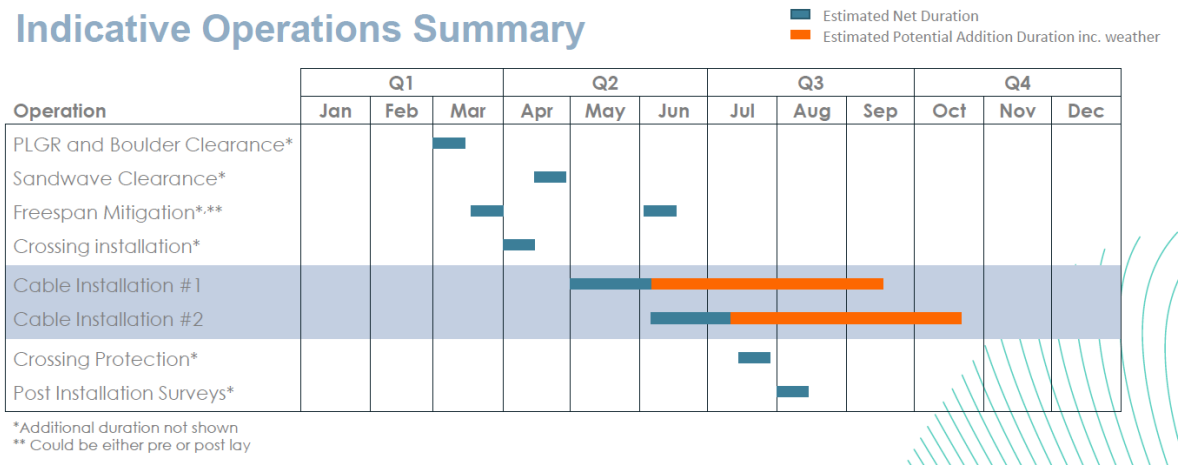

Figure 2.2: Indicative operations summary for offshore construction activities.

2.3.2 Within Figure 2.2, the shaded rows indicate those with restricted operations. Other operations (non-shaded) do have more flexibility and could be concurrent with other project activities depending upon vessel availability.

2.3.3 The NIP will cease to apply following the end of the operation and maintenance phase. Decommissioning works are excluded from consideration and will instead be considered as part of the Decommissioning Plan, noting that the Decommissioning Plan will be secured as a condition in the Deemed Marine Licence (dML).

2.4 NORTH FALLS OFFSHORE WIND FARM

2.4.1 The spatial and temporal extent of the North Falls Offshore Wind Farm ('North Falls') may be included in a future version of the NIP post consent, depending upon the respective timelines for the construction and operation of VE and North Falls.

2.5 INTERESTED PARTIES

2.5.1 Consultation relating to shipping and navigation has been ongoing throughout the scoping, Preliminary Environmental Information Report (PEIR), and Environmental Statement (ES) stages of VE as part of the NRA process. This has included preliminary discussions in relation to the NIP with HHA, Port of London Authority (PLA), Maritime and Coastguard Agency (MCA), and Trinity House.

2.5.2 Through this consultation, several Interested Parties have been identified:

- HHA;
- PLA; and
- Sunk Vessel Traffic Services (VTS).

2.5.3 Details of how these Interested Parties will be involved in the creation of the NIP is provided in Section 2.6.

2.6 UPDATES TO AND DISSEMINATION OF THE NAVIGATION INSTALLATION PLAN

2.6.1 As stated in Section 2.3, the NIP will apply throughout the construction and operation and maintenance phases. As VE evolves it may be necessary for the NIP to be updated and with changes disseminated to relevant third-parties.

2.6.2 Where updates are required, the Interested Parties will be invited by the Applicant to review and discuss any changes, and the updated NIP will then be promulgated to relevant third-parties which will include London Gateway and Medway in addition to the Interested Parties.

2.6.3 Depending upon the nature of any changes to the NIP, it may be necessary to undertake specific training to ensure that relevant third-parties (at all levels) are fully informed.

2.6.4 Additionally, the NIP will be provided to the MCA and Trinity House in advance of examination.

3 PROJECT VESSEL ACTIVITIES

3.1 INSTALLATION

PRE AND POST SURVEYS

3.1.1 Details of pre and post survey activities are provided in Table 3.1. These activities do have flexibility and could be concurrent with other projects. Table 3.1 represents indicative values with the following list noting variables which may affect final values for the parameters:

- TBC

Table 3.1 Indicative details for pre and post survey activities

Parameter	Indicative details
Vessel(s) required	*TBC*
Spatial extent covered	*TBC*
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	*TBC*
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	*TBC*
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	*TBC*
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Traffic management	*TBC*
Additional parameters to be added as required	

UXO CLEARANCE

3.1.2 Details of UXO clearance activities are provided in Table 3.2. These activities do have flexibility and could be concurrent with other projects. Table 3.2 represents indicative values with the following list noting variables which may affect final values for the parameters:

- TBC

Table 3.2 Indicative details for UXO clearance activities

Parameter	Indicative details
Vessel(s) required	*TBC*
Spatial extent covered	*TBC*

Parameter	Indicative details
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	*TBC*
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	*TBC*
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	*TBC*
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Traffic management	*TBC*
Additional parameters to be added as required	

PRE LAY GRAPNEL RUN/ BOULDER CLEARANCE/ MATTRESS INSTALLATION

3.1.3 Details of PLGR/ boulder clearance/ mattress installation activities are provided in Table 3.3. These activities do have flexibility and could be concurrent with other projects. Table 3.3 represents indicative values with the following list noting variables which may affect final values for the parameters:

- Water depth;
- Equipment;
- Operational requirements; and
- Additional duration may be required.

Table 3.3 Indicative details for PLGR/ boulder clearance activities

Parameter	Indicative details
Vessel(s) required	Typical technical considerations: bollard pull, crane or A-frame and contractor experience
Spatial extent covered	Tow length 150 metres (m)
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Estimated 14 days total
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	Circa 1 knot during operations
Continuous or discontinuous activity	*TBC*

Parameter	Indicative details
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Traffic management	
Additional parameters to be added as required	

SANDWAVE CLEARANCE

3.1.4 Details of sandwave clearance activities are provided in Table 3.4. These activities do have flexibility and could be concurrent with other projects. Table 3.4 represents indicative values with the following list noting variables which may affect final values for the parameters:

- Volume to be cleared;
- Additional duration may be required.

Table 3.4 Indicative details for sandwave clearance activities

Parameter	Indicative details
Vessel(s) required	Smaller localised areas will use a mass flow excavator system. Larger areas will use a trailing suction hopper dredger.
Spatial extent covered	*TBC*
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Estimated 14 days total
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	*TBC*
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Traffic management	*TBC*
Additional parameters to be added as required	

FREESPAN CLEARANCE

3.1.5 Details of freespan clearance activities are provided in Table 3.5. Where localised changes in seabed level result in unintended freespans of cables levelling of seabed (freespan clearance) may be required. These activities do have flexibility and could be concurrent with other projects. Table 3.5 represents indicative values with the following list noting variables which may affect final values for the parameters:

- May be required pre and post lay

Table 3.5 Indicative details for freespan clearance activities

Parameter	Indicative details
Vessel(s) required	*TBC*
Spatial extent covered	*TBC*
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Estimated 28 days total
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	Likely discontinuous
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Traffic management	*TBC*
Additional parameters to be added as required	

CABLE LAY/ BURIAL

3.1.6 Details of cable lay/ burial activities are provided in Table 3.6. These activities do not have flexibility and will not be concurrent with other projects. Table 3.6 represents indicative values for an S-lay cable methodology with the following list noting variables which may affect final values for the parameters:

- Water depth;
- Cable design (weight, load capacity, etc.);
- Soils; and
- Lay and burial equipment on the seabed.

Table 3.6 Indicative details for cable lay/ burial activities

Parameter	Indicative details
Vessel(s) required	Typical technical considerations: higher capacity to avoid offshore jointing of cable, larger vessel means deeper draught, cable design requirements, contractor experience.
Spatial extent covered	Example layback distance 50 to 150m.
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	General lay/ burial:1.5 to 4.5 days Cable jointing: circa 72 hours
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	General lay/ burial: TBC Cable jointing: circa 72 hours
Speed when undertaking activity	150 to 450m per hour
Continuous or discontinuous activity	
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Cable joints	Will be required when installation vessel has insufficient capacity to lay the whole cable. Design will depend on the cable and capacity requirements.
Traffic management	*TBC*
Additional parameters to be added as required	

CABLE PROTECTION AND CROSSINGS

3.1.7 It is intended that the export cables will be buried wherever possible. However, it is acknowledged that there may be a need for cable protection to be applied for selected sections of the export cables. In the vicinity of the defined deep water routes it will be ensured that any protection will not compromise maintaining a minimum 20m water depth.

3.1.8 There is an expectation that cable crossings will be required, most notably with the export cables for North Falls. The location of such crossings cannot be defined in detail at present but will be provided in a later update to the NIP post submission once the Development Consent Order (DCO) limits for the offshore ECC for North Falls are confirmed.

3.1.9 Details of cable protection/ crossing activities are provided in Table 3.7. These activities do have flexibility and could be concurrent with other projects. Table 3.7 represents indicative values with the following list noting variables which may affect final values for the parameters:

- Location and nature of North Falls export cables; and
- Soil.

Table 3.7 Indicative details for cable protection/ crossing activities

Parameter	Indicative details
Vessel(s) required	*TBC*
Spatial extent covered	*TBC*
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Crossing installation: circa 14 days Crossing protection: circa 14 days
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	Crossing installation: circa 14 days Crossing protection: circa 14 days
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	*TBC*
Manoeuvrability	*TBC*
Traffic management	*TBC*
Additional parameters to be added as required	

3.2 MAINTENANCE OR REPAIR

CABLE REPAIRS/ REBURIAL

3.2.1 Details of cable repairs/ reburial activities are provided in Table 3.8. These activities do not have flexibility and will not be concurrent with other projects. Table 3.8 represents indicative values with the following list noting variables which may affect final values for the parameters:

- *TBC*

Table 3.8 Indicative details for cable repairs/ reburial activities

Parameter	Indicative details
Vessel(s) required	*TBC*
Spatial extent covered	*TBC*
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	*TBC*

Parameter	Indicative details
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	*TBC*
Speed when undertaking activity	*TBC*
Continuous or discontinuous activity	*TBC*
Manoeuvrability	*For example can the vessel move during its operation or in an emergency?*
Cable joints	Will be required when the cable is damaged and requires a repair. Design will depend on the cable and capacity requirements.
Traffic management	*TBC*
Additional parameters to be added as required	

3.3 THIRD-PARTY VESSEL MOVEMENTS

3.3.1 Movements by third-party vessels have been characterised and analysed in detail in the NRA. Additionally, consideration has been given to the evolution of the baseline during the lifetime of VE.

3.3.2 However, it is recognised that at the time of installation activities commencing that vessel movements and routines may change and the evolution of the baseline may not mirror that estimated in Volume 6, Part 2, Chapter 9 and the NRA. Therefore, it is necessary to review third-party vessel movements post consent.

3.3.3 Such a review may include an analysis of vessel traffic data and consultation with relevant organisations prior to installation activities commencing. This will be agreed and the outputs shared with the Interested Parties to inform discussions surrounding the NIP.

4 PLANNED PROTOCOLS AND ACTIONS

4.1.1 This section provides details of planned protocols and actions which will be implemented for each of the project vessel activities outlined in Section 3.

4.1.2 The following elements will be considered prior to the commencement of any of the activities:

4.2 NOTIFICATION OF PLANNED ACTIVITIES

4.2.1 Process flow chart to be added in consultation with the Interested Parties which will detail how activities within the area of interest will be managed, notifications required, etc. in advance of project vessel activities.

4.2.2 Notification will also include liaison with Trinity House to identify any aids to navigation and/ or associated works which may be impacted by project vessel activities, noting that will apply throughout the DCO limits.

4.3 NAVIGATIONAL STATUS

4.3.1 Navigational status of the project vessels involved in the activities may result in third-party vessels having operational priorities as per the requirements of the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs).

4.3.2 Can the project vessel easily change its navigational status (e.g., from Restricted Ability to Manoeuvre (RAM)) depending on deployment of equipment, etc.

4.4 RESTRICTED OPERATIONS

4.4.1 For restricted operations a Hazard and Operability (HAZOP) workshop will be undertaken to discuss priorities, actions, and any pertinent information which either project vessels or third-party vessels should be aware of.

4.5 HAZOP WORKSHOP

4.5.1 Details of parties which should be involved in a HAZOP workshop and the format (in-person/ virtual).

4.6 ADDITIONAL MITIGATION MEASURES

4.6.1 Determination of whether any additional mitigation measures are required such as guard vessels, specific notifications to mariners and application of specific advisory safe passing distances.

4.7 WEATHER CONSTRAINTS AND DATA

4.7.1 Agreement on weather forecasting data sources to be implemented.

4.7.2 Discussion required on defined weather limits and associated risks to project vessel and/ or third-party vessel operations, including visibility thresholds (2 nautical miles (nm)).

4.8 CONTINGENCY PLANS

4.8.1 Determination of the actions to be taken in an emergency situation including a change in weather or visibility conditions.

4.8.2 Thresholds for which activities (including where the project vessel has restricted status) may need to be abandoned.

4.9 STAKEHOLDER RESOURCE REQUIREMENTS

4.9.1 Determination of whether any elements of the planned protocol require stakeholder resources above and beyond current manning levels and/or additional VTS functionality.

5 TIMELINE

5.1.1 The proposed timeline for updates to this NIP is outlined in Table 5.1. Once the NIP is implemented this section will be removed with future updates applied as required, as noted in Section 2.6.

Table 5.1 Timescales for VE and relevant NIP updates

Milestone	Indicative date	NIP updates
Pre meeting with Interested Parties	End January 2024	Initial version.
Follow-up meeting with Interested Parties	Late February / early March 2024	Reviewed version (post submission to address comments).
Pre application	Mid-March 2024	Final outline version.
Follow-up meeting with Interested Parties	End March 2024	Proximity to Sunk pilot boarding station to be discussed.
DCO application	*TBC*	*TBC*
Examination	*TBC*	SIMOPS and resource management to be discussed and consideration given to potential cable crossings.
Post consent	*TBC*	*TBC*
Offshore installation (export cables)	*TBC*	*TBC*
Operation and maintenance	*TBC*	*TBC*
Offshore decommissioning (export cables)	*TBC*	Superseded by Decommissioning Plan.

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