NORTH FALLS

Offshore Wind Farm

Outline Navigation and Installation Plan

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Glossary of Acronyms

AOI	Area of Interest
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
DCO	Development Consent Order
DML	Deemed Marine Licence
DWC	Deep Water Channel
ERCoP	Emergency Response Cooperation Plan
ES	Environmental Statement
Five Estuaries	Five Estuaries Offshore Wind Farm
HAZOP	Hazard and Operability
HHA	Harwich Haven Authority
m	metres
MCA	Maritime and Coastguard Agency
NIP	Navigation and Installation Plan
nm	Nautical Mile
NRA	Navigational Risk Assessment
PEIR	Preliminary Environmental Information Report
PLA	Port of London Authority
PLGR	Pre-Lay Grapnel Run
RAM	Restricted in Ability to Manoeuvre
UXO	Unexploded Ordnance
VTS	Vessel Traffic Services

Glossary of Terminology

Array area	The offshore wind farm area, within which the wind turbine generators, array cables, platform interconnector cable, offshore substation platform(s) and/or offshore converter platform will be located.
Array cables	Cables which link the wind turbine generators with each other, the offshore substation platform(s) and/or the offshore converter platform.
Offshore cable corridor	The corridor of seabed from the array area to the landfall within which the offshore export cables will be located.
Offshore export cables	The cables which bring electricity from the offshore substation platform(s) to the landfall, as well as auxiliary cables.
Offshore substation platform(s)	Fixed structure(s) located within the array area, containing HVAC electrical equipment to aggregate the power from the wind turbine generators and increase the voltage to a more suitable level for export to shore via offshore export cables.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.

1 Purpose

1. During consultation relating to the Navigational Risk Assessment (NRA) for North Falls (ES Appendix 15.1 NRA (Document Reference: 3.3.16), it was agreed with Interested Parties (as referenced in Section 2.5) that a mechanism is required for managing interactions between North Falls project vessels associated with offshore export cable installation/ maintenance/ repair and third-party vessels in navigationally sensitive areas.
2. This outline Navigation and Installation Plan (NIP) serves as such a mechanism and is considered an embedded mitigation to reduce the significance of effect associated with shipping and navigation impacts, including vessel displacement, increased third party to third party vessel 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 to non-significant levels.
3. The NIP does not consider general vessel management associated with North Falls, e.g., entry and exit points for project vessels to/ from the array areas, since this will be managed by marine coordination which will be addressed post consent as detailed in the ES Appendix 15.1 NRA (Document Reference: 3.3.16) and ES Chapter 15 Shipping and Navigation (Document Reference 3.1.17). The spatial extent covered by the NIP is presented and discussed in Section 2.1.

1.1 Updates to the Navigation and Installation Plan

4. The NIP is a live document and will be updated post consent as additional information relating to the design of North Falls 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.

2 Extent of the Navigation and Installation Plan

2.1 Spatial Extent

5. This NIP relates to a portion of the offshore cable corridor 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 (DW) routes, and the Harwich Deep Water Channel (DWC).
6. The area of interest (AOI) for this NIP is presented in Figure 2.1 and corresponding coordinates are outlined in Table 2.1 Coordinates of AOI Table 2.1.
7. Consultation input has indicated a number of key areas within the AOI of specific concern in terms of the potential for concurrent activities (see Section 4.2), which have also been shown in Figure 2.1. These areas are defined as follows:

- Sunk Pilotage Area: defined as a 1nm buffer of the charted Sunk pilot diamond, and a 1.5nm buffer of the point 1.5nm east of the Sunk pilot diamond.
- Trinity DW Area: defined as the area in the Offshore Cable Corridor within 0.5nm of the Trinity DW route (excluding the area covered by the Sunk Pilotage Area).
- Sunk DW Area – West: defined as the area in the Offshore Cable Corridor within 0.5nm of the section of the Sunk DW route that intersects the Offshore Cable Corridor.
- Sunk DW Area – East: defined as the area in the Offshore Cable Corridor within 0.5nm of the section of the Sunk DW route that does not intersect the Offshore Cable Corridor (excluding the area covered by the Sunk Pilotage Area, the Trinity DW Area, and the Sunk DW Area - West).
- Harwich Haven Authority (HHA) DW Area: defined as the area in the Offshore Cable Corridor within 0.5nm of the DW route approach to the Harwich DWC and the DWC itself (excluding the area covered by the Sunk DW Area - West).

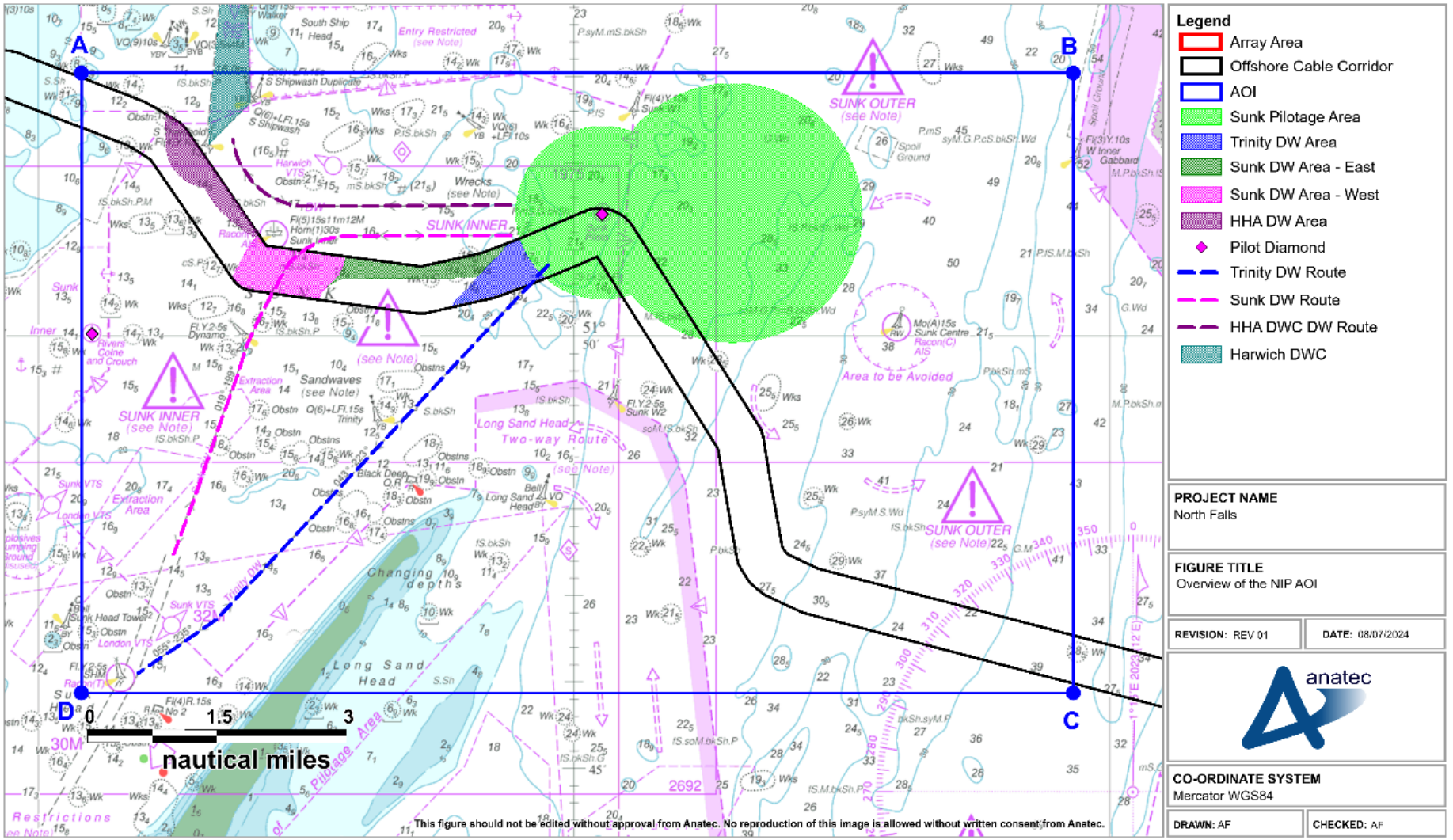

Figure 2.1 Overview of AOI (including Concurrent Working Areas)

Table 2.1 Coordinates of AOI

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

2.2 Vessel Movements and Activities

2.2.1 Project Vessels

8. Installation and maintenance activities considered in this NIP include:

- Pre and post surveys – survey work undertaken pre and post cable lay;
- Pre-Lay Grapnel Run (PLGR) / boulder clearance – clearance of obstructions along the offshore export cable route;
- Sandwave clearance – levelling of sandwaves along the offshore export cable route;
- Cable lay/ burial – laying of the cables including burial; and
- Cable repairs/ reburial – maintenance of the cables including of burial.

9. The Development Consent Order (DCO) application for North Falls does not include consent for Unexploded Ordnance (UXO) clearance. The Applicant will apply for a separate marine licence for UXO clearance post-DCO consent for any removal of UXO along the offshore export cable route. This licence will be subject to its own marine licence conditions. Where relevant, North Falls intends to adopt similar mitigations for that marine licensing process as described in this NIP noting the scenario where UXO is identified is considered in Section 4.5.

2.2.2 RAM Status

10. Some of the vessels involved in the activities listed in Section 2.2.1 may operate under Restricted in their Ability to Manoeuvre (RAM) status.

11. Concurrent activity restrictions detailed within the NIP relate to project vessels displaying RAM status and also meeting the requirements of the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) Rule 3(g)i and 3(g)v as follows:

- 3(g) The term "vessel restricted in her ability to manoeuvre" means a vessel which from the nature of her work is restricted in her ability to manoeuvre as required by the Rules [COLREGs] and is therefore unable to keep out of the way of another vessel. The term "vessels restricted in their ability to manoeuvre" shall include but not be limited to:
  - (i) a vessel engaged in laying, servicing or picking up a navigation mark, submarine cable or pipeline; and
  - (v) a vessel engaged in mine clearance operations.

12. Concurrent activities will be managed through the protocols outlined in Section 4.

2.2.3 Third Party Vessels

13. The NIP is relevant to all third-party vessel activities within the AOI, 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 HHA, noting proximity of the Sunk pilotage and associated activity; and
- Other port related third-party vessels / activities including spot dredging.

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

2.3 Temporal Extent

15. The NIP will apply from the start of offshore construction activities associated with the offshore export cables within the AOI. The indicative programme of construction activities is presented in Table 2.2.

Table 2.2 Indicative Construction Programme

	Year 1 -3	Year 4			Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Substation installation	N/A (onshore construction during years 1)							
Substation commissioning								
Export cable installation								
Foundation installation								
Array cable installation								
Wind turbine installation								
Commissioning								

16. 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 Programme, which will be required to be prepared pursuant to section 105(4) of the Energy Act 2004.

2.4 Five Estuaries

17. The cumulative impact of the Five Estuaries Offshore Wind Farm ('Five Estuaries') with North Falls has been raised as a key consideration by the Interested Parties. The spatial and temporal extent of the Five Estuaries may therefore be included in a future version of the NIP post consent, depending upon the respective timelines for the construction and operation of North Falls and Five Estuaries, and if requested by Interested Parties.

2.5 Interested Parties

18. Consultation relating to shipping and navigation has been ongoing throughout the scoping, Preliminary Environmental Information Report (PEIR), and Environmental Statement (ES) stages of North Falls 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.

19. Through this consultation, several Interested Parties have been identified:

- HHA;
- PLA;
- London Gateway;
- Port of Medway; and
- Sunk Vessel Traffic Services (VTS).

20. Details of how these Interested Parties will be involved in the creation of the NIP is provided in Section 2.6. The detailed NIP produced post-consent will be consulted on with the Interested Parties detailed above prior to submission to the MMO for approval pursuant to the Deemed Marine Licence (DML) condition.

21. Any further Interested Parties identified will be added to the NIP.

2.6 Updates To and Dissemination of the Navigation and Installation Plan

22. As stated in Section 2.3, the NIP will apply throughout the construction and operation and maintenance phases. As North Falls evolves it may be necessary for the NIP to be updated and with changes disseminated to relevant third-parties, following approval of the MMO pursuant to the DML requirements.

23. Where updates are required, the Interested Parties will be invited by the Applicant to review and discuss any changes prior to submission of the changes to the MMO for approval.

24. 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.

3 Project Vessel Activities

3.1 Installation

3.1.1 Pre and Post Surveys

25. Details of anticipated pre and post survey activities are provided in Table 3.1.

Table 3.1 Indicative details for pre and post survey activities

Parameter	Indicative Details
Vessel(s) required	Geophysical survey vessel Geotechnical survey vessel with A frame. UXO surveys

Parameter	Indicative Details
Spatial extent covered	Tow length typically 100 to 150m for geophysical surveys
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Depends on the type of survey and number of samples required.
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	Depends on the type of survey and number of samples required.
Speed when undertaking activity	Depends on types and depths of samples required. Vibrocores can take hours, boreholes dependent on the depth required.
Continuous or discontinuous activity	Continuous whist survey ongoing.
Manoeuvrability	Geophysical survey vessels can move out the way Geotech survey vessels will have restricted manoeuvrability due to being attached to seabed

3.1.2 UXO Clearance

26. Details of anticipated UXO clearance activities are provided in Table 3.2 (noting these will be subject to their own marine licensing process and mitigations and are provided here for information).

Table 3.2 Indicative details for UXO clearance activities

Parameter	Indicative Details
Vessel(s) required	Dive Support Vessel / SOV / Anchor handler
Spatial extent covered	Depends on the activity undertaken for the clearance of UXO
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Depends on number and size of UXO discovered. If controlled detonations, typically 24 hours per UXO If removal/repositioning, typically 2-4hrs per UXO See Section 4.5 for contingency plans
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	Speed of activity depends on number and size of UXO discovered
Continuous or discontinuous activity	Continuous whilst making a UXO safe
Manoeuvrability	See Section 4.5

3.1.3 PLGR/ Boulder Clearance

27. Details of anticipated PLGR/ boulder clearance activities are provided in Table 3.3.

Table 3.3 Indicative details for PLGR/ boulder clearance activities

Parameter	Indicative Details
Vessel(s) required	Vessel suitable to pull the grapnel train
Spatial extent covered	Tow length typically 150 metres (m)
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Circa 10-14 days
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	

Parameter	Indicative Details
Speed when undertaking activity	Circa 1 knot
Continuous or discontinuous activity	Continuous – with some scope to move
Manoeuvrability	RAM – however, can move off with some warning to pull up gear/move faster through section.

3.1.4 Sandwave Clearance

28. Details of anticipated sandwave clearance activities are provided in Table 3.4.

Table 3.4 Indicative details for sandwave clearance activities

Parameter	Indicative Details
Vessel(s) required	Mass flow excavator or suction hopper dredger depending on volume to be dredged
Spatial extent covered	A few meters away from the boat
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Estimated at 14 days, dependent on final cable route alignment
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	Depends on the sandwaves at the time
Continuous or discontinuous activity	Discontinuous
Manoeuvrability	RAM – Can move off with some warning.

3.1.5 Cable Lay/ Burial

29. Details of anticipated cable lay/ burial activities are provided in Table 3.5.

Table 3.5 Indicative details for cable lay/ burial activities

Parameter	Indicative Details
Vessel(s) required	Cable Lay Vessel or Cable Lay Barge. Exact vessel subject to technical considerations of the cable route e.g. draught in nearshore areas, capacity of turntable, cable design and contractor experience. Exact vessel
Spatial extent covered	Typical layback of 50 to150m
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	General Lay/burial: 1.5-4.5 days depending on soil conditions No joints planned in this area. If required could take around 1 week
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	General Lay/burial: 1.5-6 days depending on soil conditions No joints planned in this area. If required could take around 1 week
Speed when undertaking activity	150m – 450m per hour typically
Continuous or discontinuous activity	Continuous
Manoeuvrability	RAM
Cable Joints	Exact requirement of cable joints to be determined depending on the capacity of the installation vessel. No joints planned in the vicinity of the Sunk Inner or Outer Precautionary Area.

3.1.6 Cable Protection and Crossings

30. It is intended that the export cables will be buried where practicable. 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.

31. There is an expectation that cable crossings will be required, most notably with the export cables for Five Estuaries. 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.

32. Details of cable protection/ crossing activities are provided in Table 3.6. These activities do have flexibility and could be concurrent with other projects. Table 3.6 represents indicative values with the following list noting variables which may affect final values for the parameters:

- Location and nature of Five Estuaries export cables; and
- Soil.

Table 3.6 Indicative details for cable protection/ crossing activities

Parameter	Indicative Details
Vessel(s) required	Mass flow excavator or suction hopper dredger depending on volume to be dredged Cable installation will be as per Table 3.5.
Spatial extent covered	Maximum spatial extent will be for the cable lay vessel, which typically has a layback of 50 to 150m. The dredging equipment will have limited layback.
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	For crossing the DW channels: Pre-dredging DW routes. Estimated at an additional 14 days, depending on soil conditions. Cable lay and burial will be as per Table 3.5 For crossing other cables: Crossing preparation – circa 2 weeks undertaken prior to the cable installation Crossing protection – circa 2 weeks undertaken after cable installation
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	Dependent on activity.
Continuous or discontinuous activity	Continuous
Manoeuvrability	See Table 3.4 for dredging manoeuvrability, and Table 3.5 for cable lay/burial manoeuvrability

3.2 Maintenance or Repair

3.2.1 Cable Repair/Reburial

33. Details of cable repairs/ reburial activities are provided in Table 3.7.

Table 3.7 Indicative details for cable repairs / reburial activities

Parameter	Indicative Details
Vessel(s) required	This depends on the type of work required. If cable repair, could be cable lay vessel/jack-up, if cable burial could be rock dumper or vessel capable of providing cable lowering.
Spatial extent covered	Layback will be slightly longer than the cable installation. This is to allow the jointing activity to take place on deck.
Duration of activity within Sunk Inner Precautionary Area (excluding adverse weather delays)	Cable jointing – as per Table 3.5 Cable reburial – as per Table 3.5 (assumed to be the same duration as cable installation) Rock dumping – depends on the length and height of berm required. Crossing preparation – circa 2 weeks undertaken prior to the cable installation Crossing protection – circa 2 weeks undertaken after cable installation
Duration of activity within Sunk Outer Precautionary Area (excluding adverse weather delays)	
Speed when undertaking activity	N/A – undertaken at crossing locations
Continuous or discontinuous activity	Continuous
Manoeuvrability	Depends on the activity. Cable burial may be RAM, if using a tool as per installation.

3.3 Third Party Vessel Movements

34. Movements by third-party vessels have been characterised and analysed in detail in the NRA (ES Appendix 15.1 NRA (Document Reference: 3.3.16). Additionally, consideration has been given to the evolution of the baseline during the lifetime of North Falls.

35. 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 the NRA. Therefore, it is necessary to review third-party vessel movements post consent.

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

4 Planned Protocols and Actions

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

38. The following elements will be considered prior to the commencement of any of the activities listed.

4.1 Notifications of Planned Activities

39. A critical element is considered to be the timelines and procedures by which key local Interested Parties are informed of any planned activities being undertaken by North Falls within the AOI.

40. A process flow chart will be added in consultation with the Interested Parties (Section 2.5) which will detail how activities within the AOI will be managed, notifications required, etc. in advance of project vessel activities.

41. 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.

42. Initial consultation has indicated that a port representative (e.g., a pilot, or other appropriate person designated by the Interested Parties) may be required on Project vessels undertaking key activities in the AOI, for the purpose of direct communication with Sunk VTS, any guard vessels associated with the works being undertaken by the Project vessel, and any other persons as directed by the Interested Parties. If this is required by the Interested Parties, the associated processes will be included in the communication plans for specific activities.

4.2 Classification of Concurrent

43. 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), in particular vessels that are Restricted in Ability to Manoeuvre (RAM). A key concern of Interested Parties is the potential for concurrent RAM activities in the key areas defined in Section 2.1 (namely the Sunk Pilotage Area, the Trinity DW Area, the Sunk DW Area – West, the Sunk DW Area – East, and the HHA DW Area).

44. Under this NIP, concurrent RAM project vessel activities can only occur simultaneously within the Sunk Pilotage Area and the Sunk DW Area – West, or within the Sunk DW Area and the HHA DW Area. Concurrent activities within other combinations of the defined areas in Section 2.1 will not occur.

45. North Falls will seek to engage with developers of other proposed developments (e.g. Five Estuaries and SeaLink) in relation to developing concurrent working area principles, where appropriate.

4.3 Restricted Operations

46. For restricted operations[1] 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. As a minimum Interested Parties (Section 2.5) will be invited to participate however additional participants may be identified dependent on the operation. The format of the HAZOPS (e.g., in person / virtual) will be agreed with Interested Parties.

4.4 Weather Constraints and Data

47. Weather forecasting data sources will be agreed with Interested Parties (Section 2.5) and implemented. Further discussion is required on defined

[1] Any project vessel meeting the requirements of Rule 3(g) of COLREGS.

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

4.5 UXO

48. For operations identifying and/or removing UXO within the Area of Interest additional protocols will be required.

49. Initial surveys undertaken will identify potential UXO which will then be further investigated if they cannot be avoided. As part of the application process discussion will be had with relevant authorities as to the potential use of exclusion zones to maintain safety but ensure minimum disruption. This discussion will include an MCA representative given their authority for implementing exclusions.

50. A separate Marine Licence for UXO clearance will be sought pre-construction. A procedure for a scenario where UXO is identified within the AOI will be discussed with the MCA through the Marine Licensing process and as part of the Emergency Response Cooperation Plan (ERCoP) process. This will also be included within the NIP or other appropriate mitigation associated with that licence.

4.6 Contingency Plans

51. Further discussion will be undertaken on:

- Determination of the actions to be taken in an emergency situation including a change in weather or visibility conditions; and
- Thresholds for which activities (including where the Project vessel has restricted status) may need to be abandoned.

4.7 Stakeholder Resource Requirements

52. It will be determined whether any elements of the planned protocol require stakeholder resources above and beyond current manning levels and/or additional VTS functionality. Further discussion with Interested Parties (Section 2.5) is required.

4.8 Additional Mitigation Measures

53. This section will be updated on a live basis to reflect any specific additional mitigation measures identified including as part of the HAZOPs (Section 4.3) deemed of relevance will be included here.

5 Timeline

54. The proposed timeline for updates to this Outline 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 relevant NIP updates

Milestone	Indicative Date	NIP Updates
Pre meeting(s) with Interested Parties	Mid April 2024	Initial version
Follow-up meeting with Interested Parties	May 2024	Reviewed version.
Pre Application	June 2024	Final outline version.
DCO Application	July 2024	Final outline version.
Examination	TBC	TBC
Post consent	TBC	TBC
Offshore installation (export cables)	2030	TBC
Operation and maintenance	2030/2031	TBC
Offshore decommissioning (export cables)	2060 – subject to end of life considerations	Superseded by Decommissioning Plan.

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HARNESSING THE POWER OF NORTH SEA WIND

North Falls Offshore Wind Farm Limited

A joint venture company owned equally by SSE Renewables and RWE.

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