



NORTH FALLS

Offshore Wind Farm

Environmental Statement

Chapter 34 Major Accidents and Disasters

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Glossary of Acronyms

ALARP	As Low As Reasonably Practicable
AONB	Ares of Outstanding Natural Beauty
BAP	Biodiversity Action Plan
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
COMAH	Control of Major Accident Hazards
CSM-RA	Common Safety Method on Risk Evaluation and Assessment
cUXO	Confirmed Unexploded Ordnance
DCO	Development Consent Order
DML	Deemed Marine Licence
EEAST	East of England Ambulance Service Trust
EIA	Environmental Impact Assessment
ERCoP	Emergency Response Cooperation Plan
ES	Environmental Statement
ESA	Environmentally Sensitive Areas
EU	European Union
Ha	Hectare
HDD	Horizontal Directional Drilling
HEMS	Emergency Medical Services
HPI	Habitats of Principal Importance
HSA	Hazardous Substances Authority
HSE	Health and Safety Executive
IALA	International Association of Lighthouse Authorities
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organization
LNR	Local Nature Reserves
LSE	Likely Significant Effects
LWS	Local Wildlife Sites
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zones
MGN	Marine Guidance Note
MPCP	Marine Pollution Contingency Plan
MPS	Marine Policy Statement
NNR	National Nature Reserve
OCoCP	Outline Code of Construction Practice
O&M	Operation and Maintenance
OMAR	Offshore Major Accident Regulator
OPEMP	Outline Project Environmental Management Plan
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Impact Assessment Report

Puxo	Potential Unexploded Ordnance
SAC	Special Area of Conservation
SAR	Search and Rescue
SINC	Sites of Importance for Nature Conservation
SNCI	Sites of Nature Conservation Importance
SOLAS	International Convention for the Safety of Life at Sea
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
UK	United Kingdom
UKCP	United Kingdom Climate Projections
UXO	Unexploded Ordnance

Glossary of Terminology

400kV onshore cable route	Onshore route within which the onshore substation to National Grid connection point onshore export cables and associated infrastructure would be located.
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 and the offshore substation platform(s) and/or the offshore converter platform.
Hazard	A potential to threaten human life, health, property or the environment
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Offshore cable corridor	The corridor of seabed from array area to the landfall within which the offshore export cables will be located.
Offshore converter platform	Should an offshore connection to a third party HVDC cable be selected, an offshore converter platform would be required. This is a fixed structure located within the array area, containing HVAC and HVDC electrical equipment to aggregate the power from the wind turbine generators, increase the voltage to a more suitable level for export and convert the HVAC power generated by the wind turbine generators into HVDC power for export to shore via a third party HVDC cable.
Offshore export cables	The cables which bring electricity from the offshore substation platform(s) to the landfall, as well as auxiliary cables.
Offshore project area	The overall area of the array area and the offshore cable corridor.
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.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Onshore export cables	The cables which take the electricity from landfall to the onshore substation. These comprise High Voltage Alternative Current (HVAC) cables and auxiliary cables, buried underground.
Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and cables to the National Grid substation)

Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid.
PEIR offshore project area	The boundary encompassing the offshore cable corridor and array areas, as considered within the PEIR.
Platform interconnector cable	Cable connecting the offshore substation platforms (OSP); or the OSP and offshore converter platform (OCP).
Risk	The combination of the frequency and the severity of the consequence
Risk severity	Expected harm or adverse effect that may occur due to exposure to the Risk
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.
Vulnerability	Risk x receptor sensitivity in relation to shipping hazards (discussed further in ES Appendix 15.1 Navigational Risk Assessment (Document Reference 3.3.16)
Wind turbine generator	Power generating device that is driven by the kinetic energy of the wind.

34 Major Accidents and Disasters

34.1 Introduction

1. This chapter of the Environmental Statement (ES) presents a screening and assessment of the major accidents and disasters with the potential to occur in relation to the North Falls Offshore Wind Farm (OWF) project (herein 'North Falls' or 'the Project') as well as descriptions of the processes and measures to be implemented to ensure no significant effects arise in the event of a major accident or disaster. Information on the Project is provided in Chapter 5 Project Description, (Document Reference: 3.1.7) and sections of the following chapters are relevant:
 - ES Chapter 14 Commercial Fisheries (Document Reference: 3.1.16);
 - ES Chapter 15 Shipping and Navigation, (Document Reference: 3.1.17);
 - ES Chapter 17 Aviation and Radar, (Document Reference: 3.1.19);
 - ES Chapter 18 Infrastructure and Other Users, (Document Reference: 3.1.20); and
 - ES Chapter 28 Human Health, (Document Reference: 3.1.30).
2. This chapter has been written by Royal HaskoningDHV. The assessment is undertaken with specific reference to the relevant legislation and guidance, of which the principal policy documents with respect to Nationally Significant Infrastructure Projects (NSIPS) are the National Policy Statements (NPS). Details of these and the methodology used for the Environmental Impact Assessment (EIA) are presented in Section 13.6.
3. The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (the 'EIA Regulations 2017'), require a description of the likely significant effects of a development on the environment resulting from risks to human health, cultural heritage or the environment. Similarly, significant effects arising from the vulnerability of the Project to major accidents or disasters should be considered.
4. The following definitions are relevant to this chapter of the ES (Institute of Environmental Management and Assessment (IEMA), 2020):
 - 'Major accidents' are defined as 'events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.' (IEMA, 2020).
 - A 'disaster' is a sudden accident or natural catastrophe that causes great damage or loss of life. These can be natural or can be man-made hazards (e.g. caused accidental loss of containment) or external hazards (e.g. act of terrorism) which result in consequences for people or the environment.

- A 'receptor' refers to the specific component of the environment that could be adversely affected if the source reaches it.
- A 'source' refers to the original cause of the hazard, which has the potential to cause harm.
- 'Serious danger to human health' relates to the people present in the potentially affected areas, either permanently or for prolonged periods of time. This excludes workers operating at the facility.
- 'Serious damage to human populations' is harm which would be considered substantial e.g., deaths, multiple serious injuries or a substantial number requiring medical attention.
- 'Serious damage to the environment' is loss or significant detrimental impact on populations of species or organisms, harm or loss of valued sites (including designated sites), valued cultural heritage sites, contamination of drinking water supplies, ground or groundwater, or permanent or long-lasting harm to environmental receptors that cannot be restored through minor clean-up or restoration efforts.
- 'As Low As Reasonably Practicable' (ALARP) is used in assessment of major accidents and disasters involves 'weighing a risk against the trouble, time and money needed to control it' noting that 'ALARP describes the level to which we expect to see risks controlled'.

34.2 Consultation

5. Consultation with regard to major accidents and disasters has been undertaken in line with the general process described in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8). The key elements to date have included scoping and Preliminary Environmental Information Report (PEIR) consultation. The feedback received has been considered in preparing the ES. Table 34.1 provides a summary of how the consultation responses received have influenced the approach that has been taken.

Table 34.1 Consultation responses

Consultee	Date / Document	Comment	Response / where addressed in the ES
Health and Safety Executive	04/08/2021 Scoping Opinion	<p>According to HSE's records the proposed Development Consent Order (DCO) application boundary for this Nationally Significant Infrastructure Project is not within the consultation zones of any major accident hazard sites or major accident hazard pipelines.</p> <p>This is based on the current configuration as illustrated in, for example, 'Onshore Scoping Area Drawing Number PB9244-RHD-ZZ-ON-DR-GS-0060' of the document 'North Falls offshore Windfarm Environmental Impact Assessment Scoping Report Document Reference No:004027770-04 Date: 16/07/21 Revision: 04'.</p> <p>HSE's Land Use Planning advice would be dependent on the location of areas where people may be present. When we are consulted by the Applicant with further information under Section 42 of the Planning Act 2008, we can provide full advice.</p>	The boundary of the Project has changed since Scoping (see ES Chapter 5 Project Description (Document Reference: 3.1.7)), however it has reduced in size within the limits of the Scoping boundary, therefore this advice is still relevant.
Health and Safety Executive	04/08/2021 Scoping Opinion	<p>The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015 as amended.</p> <p>HSC would be required to store or use any of the Named Hazardous Substances or Categories of Substances at or above the controlled quantities set out in Schedule 1 of these Regulations.</p> <p>Further information on HSC should be sought from the relevant Hazardous Substances Authority.</p>	Hazardous substances above set threshold quantities are not part of the Project design, and therefore hazardous substances consent is not anticipated.
Health and Safety Executive	04/08/2021 Scoping Opinion	Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on NSIPs is summarised in the following Advice Note 11 Annex on the Planning Inspectorate's website - Annex G –	An assessment of the risk of major accidents and/or disasters is provided in this chapter.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		The Health and Safety Executive. This document includes consideration of risk assessments on page 3.	
Health and Safety Executive	04/08/2021 Scoping Opinion	There are no licensed explosive sites showing in the area of the proposed development.	Noted.
Public Health England	13/08/2021 Scoping Opinion	<p>Other aspects</p> <p>Within the ES, PHE would expect to see information about how the applicant would respond to accidents with potential off-site emissions (e.g., flooding or fires, spills, leaks or releases off-site). Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.</p> <p>PHE would expect the applicant to consider the Control of Major Accident Hazards (COMAH) Regulations and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations: both in terms of their applicability to the development itself, and the development's potential to impact on, or be impacted by, any nearby installations themselves subject to these Regulations.</p> <p>There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report, jointly published by Liverpool John Moore's University and the Health Protection Agency (HPA), examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: "Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be negligible." PHE supports the inclusion of this information within ES' as good practice.</p>	<p>An assessment of the risk of major accidents and/or disasters is provided in this chapter in Section 34.6.</p> <p>No dangerous substances listed under Schedule 1 of COMAH regulations is required as part of the project design and therefore hazardous substances consent is not anticipated.</p> <p>The Environmental Permitting (England and Wales) Regulations 2010 relate to mineral extractive industries and therefore are not relevant to the Project. While NFOW is applying to designate the North Falls offshore project area as a disposal site for material arising due to construction activities, this simply relates to the removal and disposal of sediments from the offshore project area back into the offshore project area and therefore is not applicable to major accidents and disasters. ES Chapter 9 - Marine Water and Sediment Quality (Document Reference 3.1.11) and in the disposal Site Characterisation Report (Document Reference 7.26) conclude that the baseline water and sediment quality for the offshore and coastal waters surrounding the offshore project area is good and site-specific information in relation to the sediment contaminant concentrations are representative of the region and are not likely to present a risk to water quality if disturbed.</p> <p>Likely significant effects on mental health have been considered within ES Chapter 28 Human Health (Document Reference: 3.1.30).</p>
Planning Inspectorate	26/08/2021	The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters	An assessment of the risk of major accidents and/or disasters is provided in this chapter. Section 34.6.2 presents the likely significant effects that

Consultee	Date / Document	Comment	Response / where addressed in the ES
	Scoping Opinion	<p>applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g., that referenced in the Health and Safety Executives (HSE) Annex to the Inspectorate's Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.</p> <p>Relevant information available and obtained through risk assessments pursuant to national legislation may be used for this purpose. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</p>	<p>may occur from hazards, classification of the likelihood that the events may occur and, where relevant, mitigation measures for each hazard are considered.</p>
Planning Inspectorate	26/08/2021 Scoping Opinion	<p>Section 4.5 of the Scoping Report sets out the Applicant's proposed approach to assessment of major accidents and disasters. It is stated that following a review of potential major accidents and disasters, a number of matters are proposed to be scoped into the ES as part of other aspect chapters, including coastal erosion and flood risk, accidental spills of hazardous materials, vessel collision and exposed cables leading to vessel snagging. The Inspectorate agrees that these matters should be scoped into the ES and can be considered as matters within relevant aspect assessments.</p>	<p>Effects on coastal erosion are considered in ES Chapter 8 Marine Geology, Oceanography and Physical Processes (Document Reference: 3.1.10).</p> <p>Effects on flood risk are considered in ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23).</p> <p>Accidental spills of hazardous materials are considered in Section 34.6.2.5 of this chapter.</p> <p>Potential vessel collisions and exposed cables leading to vessel snagging is assessed in ES Chapter 15 Shipping and Navigation (Document Reference: 3.1.17).</p>
Planning Inspectorate	26/08/2021 Scoping Opinion	<p>The Scoping Report states that a standalone assessment of major accidents and disasters is proposed to be scoped out of the ES on the basis that likely significant effects arising from this aspect associated with coastal erosion and flood risk, accidental spills of hazardous material, vessel collision and exposed cables leading to vessel snagging will be considered within the relevant aspect chapters.</p>	<p>An assessment of the risk of major accidents and/or disasters is provided in this chapter.</p>

Consultee	Date / Document	Comment	Response / where addressed in the ES
		<p>The Applicant states that a review of potential for major accidents and disasters has been undertaken and no other likely significant effects have been identified; however, the outcome of this review is not included within the Scoping Report.</p> <p>The Inspectorate does not consider that sufficient information has been presented within the Scoping Report to conclude that there would be no likely significant effects from other potential major accidents and disasters, both in respect of the vulnerability of the Proposed Development to these or for the Proposed Development to cause them.</p> <p>The results of the review exercise completed by the Applicant should be presented in the ES. This should include a description of the sources of hazards and pathways that have been considered as part of the review process and why these have been discounted. Where likely significant effects are identified, these should be assessed in the ES.</p> <p>In this regard, the Inspectorate notes that there is potential for wartime Unexploded Ordnance (UXO) to be located within the offshore scoping area and no information has been presented about their locations and potential for accidental detonation and associated impacts that could lead to a major accident or disaster.</p> <p>In addition, the potential for cumulative effects arising from major accidents and disasters in terms of inter relationships with other aspects of the Proposed Development and other projects should be considered, and where significant effects are likely to occur, these should be assessed within the ES.</p>	
Health & Safety Executive	PEIR Response 23/05/2023	<p>According to HSE's records, the proposed DCO application boundary for this Nationally Significant Infrastructure Project is not within the consultation zones of any major accident hazard sites or major accident hazard pipelines. This is based on the project area 'redline' in drawing 'Onshore Project Area' PB9244-RHD-ZZ-ON-DR-GS-0193 Rev 02 dated 24/04/2023 within Volume II of Chapter 1 of the PEIR.</p> <p>HSE's Land Use Planning advice is dependent on the location of areas where people may be present within HSE's land-use planning zones. As the project area 'redline' is not within any of HSE's land-use planning zones, under HSE's existing policy for providing land-use</p>	<p>Although the boundary of the Project has changed since PEIR (see ES Chapter 5 Project Description (Document Reference: 3.1.7)), it has reduced in size within the limits of the Scoping boundary, therefore this advice is still relevant.</p>

Consultee	Date / Document	Comment	Response / where addressed in the ES
		planning advice, HSE would not advise against the development. HSE's advice in response to a subsequent planning application may differ should HSE's policy or the scope of the development change by the time the Development Consent Order application is submitted.	
Health and Safety Executive	PEIR Response 23/05/2023	Consideration of Risk Assessments Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role in NSIPs is summarised in Advice Note 11 'working with public bodies in the infrastructure planning process' Annex G on the Planning Inspectorate's website [Advice notes National Infrastructure Planning (planninginspectorate.gov.uk)] - Annex G – The Health and Safety Executive. This document includes consideration of risk assessments under the heading "Risk assessments".	This chapter provides an assessment of likely significant effects arising from the Project's vulnerability to major accidents. This concludes that the risk of 'major accidents and/or disasters' associated with any aspect of the Project, during the construction, operation and decommissioning phases is negligible.
Suffolk & North East Essex Integrated Care Board (ICB)	PEIR Response 14/07/2023	<p>1. It is noted that in Chapter 5 of the PEIR there is reference to the potential impact on various aspects as a result of a major accident or disaster, in particular once the development has been completed.</p> <p>2. However the information in this chapter does not make reference to the potential impact on healthcare services from a major accident or disaster occurring during the various phases of construction, both offshore and onshore.</p> <p>3. Whilst the PEIR recognises the availability of local A&E and blue-light services it hasn't assessed the impact on these services from such an event occurring during both construction phases, something that is statistically more likely to occur during construction than once the project has been finished and the wind farm is operating. For greater detail on some of the impacts a major accident or disaster could have please review the specific section in the response provided by East of England Ambulance Service Trust (EEAST) (appendix 2).</p> <p>4. In addition the PEIR hasn't suggested any healthcare specific mitigating actions that could be put in place.</p>	<p>Likely significant effects upon local healthcare services are assessed in ES Chapter 28 Human Health (Document Reference: 3.1.30), with details regarding the impacts upon people suffering health inequalities are detailed in ES Chapter 30 Socio-economics (Document Reference: 3.1.32).</p> <p>This chapter provides further detail regarding the effects upon the Project of major accidents and disasters.</p> <p>Note that as discussed in Section 34.6.2.7 offshore wind has a good (and improving) health and safety record. Given the number of workers involved in construction (a peak of 471 (see ES Chapter 31 Socio-Economics, (Document Reference: 3.1.33)) and safety record there is minimal risk of workplace accidents and reliance on local services (see also Table 28.5 in ES Chapter 28 Human Health, (Document Reference: 3.1.30))</p>

Consultee	Date / Document	Comment	Response / where addressed in the ES
		5. Hence the ICB and its partners request that this specific aspect is fully assessed and mitigations developed in collaboration with relevant local healthcare organisations, with consideration being given to securing the mitigating actions via a Section 106 planning obligation, ahead of the ES being produced.	
Suffolk & North East Essex ICB	PEIR Response 14/07/2023	With regard to impacts from major accidents and disasters, it is noted that there are no specific references to major accidents or disasters in relation to their likely impact on healthcare and services, in particular within Chapter 31 (Socio-Economics) of the PEIR. Given that people affected by a major accident or disaster associated with the project are likely to be transferred to either Colchester or Ipswich Hospital, the impacts of such an event(s) on these facilities should be fully addressed. Therefore, it is requested that the PEIR is updated accordingly, and that major accidents and disasters are included in the HIA.	
Suffolk & North East Essex ICB	PEIR Response 14/07/2023	<p>Major Accidents & Disasters</p> <p>It is evident that a significant level and duration of construction phase work reliant on the use of sea-based construction vessels, helicopters, heavy lift plant and specialist marine based working platforms/ machinery/ equipment, producing noise, heat, vibration and dust (with work carried out on a 24 hour/ 7 day a week basis during potentially adverse weather conditions) is likely to present construction site hazards and dangers both at sea and on land.</p> <p>Working on sea platforms, coastal, cliff edge and uneven ground, with moving machinery lifting and transporting materials, and working at depth, including the potential for trench collapse, underlines the risks associated with the construction related activities – requiring both urgent and other medical interventions and transport conveyance (including specialised airborne tasking/ conveyance) to be appropriately planned for and provided.</p> <p>Indeed, the Health & Safety Executive (HSE's) construction publications for Great Britain, indicate that work related incidents involving serious injury and fatalities, are statistically significantly higher for the construction industry as compared to the 'all industry' rate.</p>	<p>For EIA purposes, a disaster is typically defined as a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.</p> <p>The site selection process implemented by the Project avoided significant interactions with existing infrastructure through a combination of consultation, desk-based research, and surveys. In addition, the site selection and project design process have ensured that project infrastructure and construction methodologies avoid potential hazards or will be designed around them (for example coastal erosion, surface water flooding etc, see Table 34.4).</p> <p>In relation to workplace accidents and incidents described, as discussed in Section 34.6.2.7 offshore wind has a good (and improving) health and safety record. Given the number of workers involved in construction (a peak of 471 (see ES Chapter 31 Socio-economics, (Document Reference: 3.1.33)) and safety record there is minimal risk of workplace accidents and reliance on local services (see also Table 28.5 in ES Chapter 28 Human Health, (Document Reference: 3.1.30). As set out in the Outline Project Environmental Management Plan (OPEMP) (Document Reference 7.6), an offshore Emergency Response Co-Operation Plan (ERCOP) will be developed following discussions with relevant stakeholders. These will</p>

Consultee	Date / Document	Comment	Response / where addressed in the ES
		<p>Information to determine the effect of the construction phase and its impact on EEAST's operational capacity, efficiency and resources is currently absent from the PEIR documentation, and its related mitigation and management measures, however.</p> <p>In the event of a construction phase accident, appropriate procedures would need to be put in place for emergency access, on-site triage, medical assessment and patient identification, stabilisation and transfer to an appropriate healthcare setting.</p> <p>The processes and procedures developed by SSERWE, and any outsourced construction organisations, should refer to legislation and technical guidance which places a duty on SSERWE to have its own response and medical mitigation to take the patient to a place of 'normal access' and handover to EEAST crews.</p> <p>EEAST would expect any trench collapse to fall under the confined space regulations and SSERWE, the construction company and/or contractor(s) should have access to a confined space trained team that could extricate a casualty safely.</p> <p>Plans and contingencies for facilitating emergency access, on-site triage, medical assessment, patient identification, stabilisation, clinical information, safe and efficient handover to EEAST responders, whilst sustaining operationally optimal attendance times (noting the likely delay factors above) which in urgent cases may require Helicopter Emergency Medical Services (HEMS) and/or Air-Sea Rescue access, is therefore considered to be necessary.</p> <p>The incidence and impact of major accidents (and disasters) on EEAST and its HEMS partner operational capacity, efficiency and resources, including EEAST hazardous area response teams (HART - which may also require co-ordination and joint tasking with the Maritime & Coastguard Agency) needs to be presented and assessed, with any necessary mitigation and management measures secured and implemented through DCO Requirements, and/ or via a Section 106 planning obligation or Deed of Obligation, as part of any Development Consent Order approval.</p>	<p>include risk assessments and designated evacuation plans for workers in the event of an incident.</p> <p>NFOW will ensure through its procurement process that all contractors will comply with the supplier Code of Conduct that will be put in place, as well as them being required to comply with all health and safety legislation. Further details of Contractor requirements are set out in the OPEMP (Document Reference 7.6) and the Outline Code of Construction Practice (OCoCP) (Document Reference 7.13).</p> <p>The OCoCP includes a section on Local Community Liaison stating that a Stakeholder Communications Plan will be developed which will set out how effective and open communication with local residents, businesses, the local community and the emergency services that may be affected by the construction works will take place.</p> <p>ES Chapter 274 Traffic and Transport, (Document Reference: 3.1.296) includes consideration of severance, amenity and pedestrians delay impacts, road safety impacts, driver delay (capacity), driver delay (highway constraints), driver delay (road closures) and abnormal loads (special order vehicles), all of which have the potential to impact EEAST (East of England Ambulance Service Trust) operations. Mitigation measures presented within the Outline Construction Traffic Management Plan (CTMP) are deemed adequate and appropriate to mitigate likely significant effects on EEAST operations and is secured via the draft DCO.</p> <p>Provisions set out in the Outline Construction Traffic Management Plan (OCTMP) (Document Reference 7.16) and the OCoCP (Document Reference 7.13) are adequately and appropriately secured via DCO requirement / DML condition and there is no need for a Section 106 planning obligation (or Deed of Obligation).</p>
Health & Safety Executive	Targeted consultation	According to HSE's records, the proposed DCO application boundary for this Nationally Significant Infrastructure Project is not within the consultation zones of any major accident hazard sites or major	As this comment applies to the variations to the PEIR boundary which were subject to targeted consultation, along with the comments made in HESs PEIR response above, this is confirmation that the DCO application

Consultee	Date / Document	Comment	Response / where addressed in the ES
	Response 23/05/2023	accident hazard pipelines. HSE's Land Use Planning advice is dependent on the location of areas where people may be present within HSE's land-use planning zones. As the project area 'redline' is not within any of HSE's land-use planning zones, under HSE's existing policy for providing land-use planning advice, HSE would not advise against the development. HSE's advice in response to a subsequent planning application may differ should HSE's policy or the scope of the development change by the time the Development Consent Order application is submitted.	boundary (the onshore project area) is not within the HSEs) land-use planning zones.

34.3 Scope

34.3.1 Study area

6. The study area for the individual hazards has been determined in relation to the impact pathways, the distances to the receptors or from examination of the scale of impacts from examples of historical incidents where available. The geographic scope may reach beyond the onshore and offshore project areas, where there is the potential for interaction. Professional judgement has informed the scope relating to the hazards with the potential for interaction with the Project. The offshore and onshore project areas are provided in Figures 5.1 and 5.2 (Document Reference 3.2.3) respectively.
7. The following grid connection options are therefore included in the Project design envelope:
 - Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a project alone onshore cable route and onshore substation infrastructure;
 - Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries; or
 - Option 3: Offshore electrical connection, supplied by a third party.

34.3.2 Realistic worst-case scenario

8. The worst case scenario relates to the key components of North Falls outlined below and detailed in ES Chapter 5 Project Description (Document Reference: 3.1.7).
9. offshore components considered in this ES comprise:
 - Under Option 1 and Option 2:
 - Wind turbine generators (WTG) and their associated foundations;
 - Up to two offshore substation platforms (OSP) and their associated foundations to aggregate electricity from the wind turbine generators and facilitate the export of electricity via the Project's offshore export cables;
 - Subsea cables:
 - Array cables between the WTGs and between the WTGs and the OSP(s);
 - Platform interconnector cable between the OSPs, if required.
 - Offshore export cables between the OSP(s) and landfall;
 - Scour protection around foundations, where required; and
 - Surface laid cable protection, where required.

- Under Option 3:
 - Wind turbine generators (WTG) and their associated foundations;
 - Up to one offshore substation platform (OSP) and associated foundation to aggregate electricity from the wind turbine generators;
 - One offshore converter platform (OCP) and associated foundation to increase the voltage of electricity for export and convert the HVAC power generated by the wind turbine generators into HVDC power for export via an HVDC interconnector cable supplied by a third party (which does not form part of this DCO application);
 - Array cables between the WTGs and between the WTGs and OSP(s)/OCP;
 - Platform interconnector cable between the OSP and OCP;
 - Scour protection around foundations, where required; and
 - Surface laid cable protection, where required.
10. Under Options 1 and 2, the key onshore components considered in this ES comprise:
- Landfall;
 - Onshore export cables housed within cable ducts and associated joint bays and link boxes;
 - Onshore substation and ancillary works;
 - Connection to the national grid;
 - Works to improve Bentley Road and provision of temporary footway/cycleway; and
 - Temporary works to facilitate construction (TCCs, temporary means of access).
11. Under Option 2, this also includes:
- Cable ducts for the installation for Five Estuaries onshore export cables.
12. The temporal scope relates to the lifespan of the Project, through construction, operation and maintenance (O&M), and decommissioning. The indicative total construction duration is 5 years and the indicative operational life of North Falls is 30 years.

34.4 Assessment methodology

34.4.1 Legislation, guidance and policy

13. The following legislation, guidance and policy documents are relevant to major accidents and disasters. Further information on the legal framework is presented in ES Chapter 3 Policy and Legislative Context, (Document Reference: 3.1.5).

34.4.1.1 *Relevant legislation*

14. The screening and assessment of major accidents and disasters has been developed with reference to the following legislation:

- Health and Safety at Work etc. Act 1974 (HASWA 1974);
- Health and Safety at Work Acts 1974 (Application outside Great Britain) Order 2013;
- The Management of Health and Safety at Work Regulations 1999 (MHSWA 1999);
- Construction (Design and Management) Regulations 2015 (CDM Regulations);
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017;
- The Marine Works Environmental Impact Assessment) Regulations 2007 (as amended);
- Offshore Installations (Offshore Safety Directive) (Safety Cases etc.) Regulations 2015;
- Control of Major Accident Hazards (COMAH) Regulations 2015
- The Health and Safety (Amendment) (European Union (EU) Exit) Regulations 2018;
- The Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009;
- The Workplace (Health, Safety and Welfare) Regulations 1992;
- Electricity at Work Regulations 1989 (No. 635);
- The Civil Contingencies Act 2004;
- The Planning (Hazardous Substances) Regulations 2015;
- International Convention for the Safety of Life at Sea (SOLAS), 1974; and
- Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972.

34.4.1.2 *Relevant guidance*

15. The screening and assessment of major accidents and disasters has been developed with reference to the following guidance:

- United Kingdom (UK) National Risk Register 2023;
- HSE General guidance for all workplaces;
- ISO 31000: 2018 Risk Management – Guidelines;
- ISO 31000:2018 – Risk management – A practical guide;
- MCA Marine Guidance Note 654 (M+F) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response;

- MCA Marine Guidance Note 372 Amendment 1 (M+F) Offshore Renewable Energy Installations (OREIs): Guidance to Mariners Operating in the Vicinity of UK OREIs;
- Offshore Wind and Marine Energy Health and Safety Guidelines (RenewableUK, 2014);
- Integrated Offshore Emergency Response – Renewables (IOER-R) Good Practice Guidelines for Offshore Renewable Energy Development (RenewableUK, 2016);
- Vessel Safety Guide, Guidance for Offshore Renewable Energy Developers (RenewableUK, 2015);
- Relevant legislation, policy and guidance applicable to the assessment of aviation and radar listed in ES Chapter 17 Aviation and Radar, (Document Reference: 3.1.19);
- IEMA, 2016. EIA Quality Mark Article: Assessing Risks of Major Accidents / Disasters in EIA;
- IEMA, 2020. Major Accidents and Disasters in EIA: A Primer;
- IEMA, 2017. EIA Quality Mark Article: What is this MADness?;
- Guidelines for Environmental Risk Assessment and Management Green Leaves III (DEFRA, 2011);
- Health Impact Assessment in spatial planning A guide for local authority public health and planning teams (Public Health England, 2020); and
- UK Joint interim statement (2022) Unexploded ordnance clearance.

34.4.1.3 *Relevant policy*

16. Policy documents used in this screening and assessment of major accidents and disasters:
 - The UK Marine Policy Statement (DEFRA, 2011);
 - National Planning Policy Framework (DFLUHC, 2023);
 - Overarching National Policy Statement (NPS) for Energy (EN-1) (DESNZ, 2023); and
 - East Inshore and East Offshore Marine Plan (MMO, 2014).
17. Table 34.2 outlines the policies regarding major accidents and disasters of relevance to the Project and shows where these are addressed in the ES.

Table 34.2 Policy requirements

Policy requirement	Policy reference	ES reference
UK marine policy statement		
Environmental impacts can be through accidental pollution from ships in the course of navigation or lawful operations, pollution caused by unlawful operational discharges by ships, such as oil, waste or sewage, or physical damage caused by groundings or collisions. Other pressures on the environment from	Paragraph 3.4.6	Section 34.6.2 assesses the likely significant effects from hazards, including pollution. Classification of the likelihood that the events may occur alongside with mitigation measures for each hazard are considered.

Policy requirement	Policy reference	ES reference
shipping and ports relate to noise, airborne emissions and the introduction and spread of non-indigenous species (transported on the hulls of ships or in ballast water)		Noise and emissions from shipping were scoped out, in accordance with the Scoping Opinion (Document Reference: 7.25). Spread of non-indigenous species (invasive non-native species) is assessed in ES Chapter 10 Benthic and Intertidal Ecology (Document Reference:3.1.12).
National Planning Policy Framework		
Local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them	Paragraph 45	Consultation with Essex County Council has been undertaken and is presented in Section 34.2 Consultation (see Table 34.1).
Overarching NPS for Energy (EN-1)		
Applicants should consult with the HSE on matters relating to safety	Paragraph 4.13.5	HSE has been consulted and feedback is presented in Section 34.2 Consultation (see Table 34.1).
HSE is a statutory consultee on applications for hazardous substances consent. HSE is required to undertake detailed assessment work before producing its public safety statutory advice and the supporting consultation distances. This involves HSE considering the compatibility of the proposal outlined in the application (e.g. to store defined quantities of each hazardous substance in specific locations on site) against the risks to the offsite population. HSE advice takes into account existing and potential developments in the area. The aim of HSE's advice is to mitigate the effects of a major accident on the populations around a major hazard site or pipeline	Paragraph 4.14.3	According to HSE's records the proposed DCO application boundary for this Nationally Significant Infrastructure Project is not within the consultation zones of any major accident hazard sites or major accident hazard pipelines (see Table 34.1)
Applicants must consult the I [Hazardous Substances Authority] and HSE at pre-application stage if the project is likely to need hazardous substances consent. Hazardous substances consents are a part of the planning regime which contributes to public safety.	Paragraph 4.14.5	Hazardous substances above set threshold quantities are not part of the Project design, and therefore hazardous substances consent is not anticipated.
East Inshore and East Offshore Marine Plan		
The risk of release of hazardous substances as a secondary effect due to any increased collision risk should be taken account of in proposals that require an authorisation.	Policy ECO2	Accidents and disasters such as release of hazardous substances and navigational safety risks are discussed in Section 34.6.2 Potential vessel collisions and exposed cables leading to vessel snagging is assessed in ES Chapter 15 Shipping and Navigation (Document Reference 3.1.17). ES Chapter 15 Shipping and Navigation (Document Reference 3.1.17) assesses any risks to navigational safety associated with the Project, including due to increased vessel movement to and from the offshore project area and the presence of offshore

Policy requirement	Policy reference	ES reference
		<p>infrastructure during the life cycle of the Project.</p> <p>Mitigation of any accidental pollution is outlined in ES Chapter 9 Marine Water and Sediment Quality (Document Reference 3.1.11) and discussed further in the Outline Project Environmental Management Plan (Document Reference 7.6).</p>

34.4.2 Impact assessment methodology

18. For the assessment of major accidents and disasters within EIA there is no standard methodology, however, IEMA have prepared the 'Major Accidents and Disasters in EIA: A Primer' (IEMA, 2020) which provides guidance on a risk-based approach. This chapter assesses the likelihood of the significant threat or hazard occurring, and the mitigation embedded to ensure a risk is ALARP (or avoided completely). The risks were identified in respect of the potential vulnerability of the Project to disaster risks, and the potential for the Project to cause major accidents or disasters.
19. The following steps were undertaken and are described in Section 34.5.1.1:
- Stage 1: Identify the hazards in a long list of possible major accidents and events. Major accidents with little relevance to the Project were not included (e.g., volcanic eruptions). Sources included the UK Government National Risk Register – 2023 edition. This stage also involved identification of the receptors in the existing environment.
 - Stage 2: Screening exercise to determine which risks are relevant to the Project and require further assessment.
 - Stage 3: Risk evaluation - definition of the likely significant effects that may occur from the risks and classification of the likelihood that the events may occur. Identification and evaluation of prevention, minimisation and/or mitigation measures.
 - Stage 4: Determination of whether the risk has been mitigated to ALARP and the identification of any residual risk, and the consequences upon the receptors in the event of a major accident or disaster.

34.4.2.1 Risk evaluation

20. Major accidents and disasters, by definition, are those with the potential to have serious consequences for the receptors affected. The thresholds of what constitutes a major accident or disaster varies by receptor, and the definitions of the thresholds for the relevant receptors is provided in Table 34.3.
21. The likelihood of a serious event occurring is examined when determining whether a hazard constitutes a major accident or disaster. Events of high consequence with a high likelihood of occurring are determined to be high risk and are unacceptable for any development and are designed out (an example may be infrastructures that did not comply with design codes causing a major failure). These are therefore outside the scope of this assessment. Low impact events which do not meet the criteria listed in Table 34.3 are not considered a

major accident or disaster and are therefore outside the scope of this assessment.

22. This chapter identifies low likelihood, high consequence events with the potential to occur in the onshore and offshore project areas that may be determined to constitute a major accident or disaster. It also sets out the Project's embedded and additional mitigation measures in place and provides an assessment of whether effects have been reduced to ALARP or avoided.

34.5 Existing environment

23. The onshore and offshore project areas are not within the consultation zones of any major accident hazard sites or major accident hazard pipelines as highlighted by HSE in Table 34.1.
24. The following chapters describe the existing environment with regards to these related topics:
 - ES Chapter 14 Commercial Fisheries, (Document Reference: 3.1.16);
 - ES Chapter 15 Shipping and Navigation, (Document Reference: 3.1.17);
 - ES Chapter 17 Aviation and Radar, (Document Reference: 3.1.19);
 - ES Chapter 18 Infrastructure and Other Users, (Document Reference: 3.1.20); and
 - ES Chapter 28 Human Health, (Document Reference: 3.1.30).

34.5.1.1 Receptors

25. The potential receptors relevant to this screening and assessment are provided with definitions in Table 34.3. The level of harm considered to represent a major accident or disaster is also presented. The thresholds for receptors to be considered under a major accident and disaster have been determined using industry good practice based upon the former criteria for the notification of a major accident to the European Commission (Schedule 5 of the COMAH Regulations) and guidance on the interpretation of major accidents to the environment for the purpose of the COMAH Regulations (DETR, 1999).

Table 34.3 Receptors requiring consideration for major accidents and disasters for the Project

Receptor group	Receptors included	Major accident or disaster thresholds
Population and human health	Local communities; Recreational and third part commercial users (including shipping or fisheries); and Construction workers, operation and maintenance workers.	For the public: Substantial number (5+) of people requiring medical attention or any serious/life-changing injuries. Potential for localised interruption to utilities and damage to infrastructure. For workers: Multiple life changing injuries or fatalities.
Designated Sites (International, National and Other)	Special Areas of Conservation (SAC); Special Protection Areas (SPA); Ramsar Sites; Sites of Special Scientific Interest (SSSI); National Nature Reserves (NNR); Marine Conservation Zones (MCZ); National Parks; Environmentally Sensitive Areas (ESA); Ares of Outstanding Natural Beauty (AONB); Local Nature Reserves (LNR); Local Wildlife Sites (LWS), also known as County Wildlife Sites; Sites of Importance for Nature Conservation (SINC); and Sites of Nature Conservation Interest (SNCI).	For NNRs, SSSIs, MRRs, the thresholds are: Greater than 0.5ha adversely affected, or greater than 10% of the area of the site affected (whichever is the lesser); or Greater than 10% of an associated linear feature adversely affected; or Greater than 10% of a particular habitat or population of individual species are adversely affected. For SACs, SPAs, and Ramsar Sites, the thresholds are: Greater than 0.5ha or 5% of the area of the site is adversely affected (whichever is the lesser) or Greater than 5% of an associated linear feature is adversely affected; or Greater than 5% of a particular habitat or population of individual species are adversely affected. For other designated land the thresholds are: Greater than 10% or 10ha of land damaged (whichever is the lesser).
Scarce Habitats	Biodiversity Action Plan (BAP) habitats; and Habitats of Principal Importance (HPI).	Damage to 10% of the area of the habitat or 2ha (whichever is the lesser).
Widespread habitat	Land/water used for agriculture, forestry, fishing or aquaculture.	Contamination of 10ha or more of land which, for one year or more, prevents the growing of crops or the grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances; or Contamination of any aquatic habitat which prevents fishing or aquaculture or which similarly renders it inaccessible to the public.

Receptor group	Receptors included	Major accident or disaster thresholds
Particular species	Particular species covers all species, both flora and fauna, found in the UK and includes common species, Red Data Book species and other protected or priority species, including rare species.	<p>For common species, where reliable estimates of population numbers exist, the death of, or serious sub-lethal effects within 1% of any species would be significant; or</p> <p>For common plant species, the death of, or serious sub-lethal effects within 5% of the ground cover would be considered a major accident; or</p> <p>For species listed in the Annexes of the Habitats Directive and the Birds Directive, the schedules of the Wildlife and Countryside Act 1981 (and amendments), all Red Data Book species and priority species under the UK Biodiversity Action Plan, the threshold may be lower than 1% or 5%, and liaison with the appropriate statutory conservation organisation should be used to determine the appropriate threshold; or</p> <p>For all species, where reliable estimates of population numbers do not exist, liaison with the statutory authority will be necessary to determine appropriate thresholds; or</p> <p>Any loss of a Red Data Book species (or a Red Data Book species site).</p>
Marine environment	Non-estuarine marine waters; Sub-littoral zones; Benthic community adjacent to the coast; and Fish spawning grounds.	<p>Permanent or long-term damage to:</p> <p>An area of 2ha or more of the littoral or sub-littoral zone, or the coastal benthic community, or the benthic community, or the benthic community of any fish spawning ground; or</p> <p>An area of 100ha or more of the open sea benthic community.</p> <p>Or a count of:</p> <p>100 or more dead sea birds (not gulls); or</p> <p>500 dead sea birds of any species; or</p> <p>5 dead or significantly injured/impaired sea mammals of any species.</p>

34.5.2 Future trends in baseline conditions

26. The future baseline for the Project relevant to major accidents and disasters will evolve relating to several likely factors over the Project lifetime.
27. Climate change is likely to lead to changes in rainfall and temperature, increased occurrences of extreme weather, and rising sea levels. Predictions for changes in climate until the end of the 21st century are available from The UK Climate Projections (UKCP, 2022). The impacts of climate change are set out in more detail in ES Chapter 33 Climate Change (Document Reference: 3.1.35).
28. There are likely to be advances in technology over the Project lifespan, with potential for further reductions in risks to safety and the environment, or to introduce new hazards with the introduction of novel technology. Novel technologies would be implemented following appropriate risk assessment processes.

34.6 Screening and assessment of major accidents and disasters

34.6.1 Stages 1 and 2

29. This section describes and identifies the likely significant effects (LSE) deriving from the vulnerability of the Project to major accidents and disasters. Hazards with the potential to cause major accidents and disasters during construction, operation and decommissioning, and justification for inclusion in the short list of hazards for further assessment are provided in Table 34.4. Also included in the assessment are instances where the Project increases the probability of a hazard occurring, or the consequences of a hazard may be exacerbated by the Project. Hazards were identified using the National Risk Register, professional judgement, and a review of available literature.
30. Hazards from the longlist in Table 34.4 considered for further assessment are:
 - Major Accidents:
 - Major fires;
 - Project Specific Hazards:
 - Exposed cables leading to vessel snagging;
 - Vessel interactions (e.g. collision, allision);
 - Aviation collision;
 - Accidental spills of hazardous material;
 - Disturbance of UXO; and
 - Workplace accident.

Table 34.4 Longlist of risks

Hazard	Relevant for shortlist	Justification	Receptors
Malicious Attacks			
Attacks on publicly accessible locations	No	The Project is no more vulnerable to this type of hazard than any other development.	N/A
Attacks on infrastructure	No		N/A
Attacks on transport	No		N/A
Cyber attacks	No		N/A
Chemical, Biological or Radiological and Nuclear attacks	No		N/A
Undermining the democratic process	No		N/A
Serious and Organised Crime			
Serious and organised crime – vulnerabilities	No	The Project is no more vulnerable to this type of hazard than any other development.	N/A
Serious and organised crime – prosperity	No		N/A
Serious and organised crime – commodities	No		N/A
Environmental Hazards			
Coastal flooding	No	Events would have negligible consequence on the Project due to the presence of coastal flood defences at the landfall location.	N/A
Coastal erosion	No	Horizontal Directional Drilling (HDD) will be used to install cables in the coastal zone and there will be no alteration to the potential for coastal erosion, or changes to the potential consequences from coastal erosion events (see ES Chapter 8 Marine Geology Oceanography and Physical Processes, (Document Reference: 3.1.10)).	N/A
River flooding	No	The project design will consider the effect of river flooding; however, a river flooding event would have minimal interaction with the Project (see ES Chapter 21 Water Resources and Flood Risk, (Document Reference: 3.1.23)).	N/A

Hazard	Relevant for shortlist	Justification	Receptors
Surface water flooding	No	The project design will consider the effect of surface flooding, however, a surface flooding event would have minimal interaction with the Project (see ES Chapter 21 Water Resources and Flood Risk, (Document Reference:3.1.23).	N/A
Storms	No	Damage to infrastructure from severe weather is unlikely to result in hazards with significant risk. In cases where infrastructure is damaged and turbine blades are lost to sea, this is considered unlikely to cause injury as the Project will be unmanned (and maintenance would not occur in extreme weather). Risks to non-project vessels are assessed in ES Chapter 15 Shipping and Navigation (Document Reference:3.1.17), including consideration of adverse weather conditions, and concluded to be tolerable or broadly acceptable and ALARP.	N/A
Low temperature	No	The design of infrastructure will consider the likely range of temperatures within which it will be operated, however extremes of temperature would affect operational efficiency rather than structural integrity.	N/A
Heatwaves	No		N/A
Droughts	No	Events would not affect the Project.	N/A
Severe space weather	No	The Project is no more vulnerable to this type of hazard than any other developments.	N/A
Poor air quality	No	Event would not affect the Project.	N/A
Earthquakes/seismic activity	No	The design of infrastructure will consider likely range of seismic activity for its location. Earthquakes in the UK are rare, and an earthquake powerful enough to inflict severe damage is unlikely. Damage from UK earthquakes would be greatest in historic buildings (HM Government, 2023).	N/A
Environmental disasters overseas	No	Events would not affect the Project.	N/A
Wildfires	No	The Project is no more vulnerable to this type of hazard than any other development.	N/A
Human and Animal Health			
Pandemics	No	Event would not affect the Project.	N/A
High consequence infectious disease outbreaks	No		N/A
Antimicrobial resistance	No		N/A
Animal disease	No		N/A
Major Accidents			

Hazard	Relevant for shortlist	Justification	Receptors
Widespread electricity failures	No	Events would have negligible consequence on the Project.	N/A
Major transport accidents	No	Transport (shipping) accidents discussed further under project specific hazards below.	N/A
System failures	No	Events would have negligible consequence on the Project.	N/A
Commercial failures	No		N/A
Systematic financial crisis	No		N/A
Industrial accidents – nuclear	No		N/A
Major fires	Yes		Event may lead to serious damage to the environment through harmful emissions to air, land and water and create a localised fire hazard.
Societal Risks			
Industrial action	No	The Project is no more vulnerable to this type of hazard than any other developments.	N/A
Widespread public disorder	No	The Project is no more vulnerable to this type of hazard than any other developments.	N/A
Project Specific Hazards			
Exposed cables leading to vessel snagging	Yes	Risk of loss of life and damage to Project infrastructure and other marine users.	Population and human health, biodiversity, material assets.
Seabed conditions affecting foundations	No	Pre-construction surveys will ensure that foundations are secure.	N/A
Vessel interactions (e.g. collision, allision)	Yes	Risk of loss of life and damage to Project infrastructure and other marine users.	Population and human health, biodiversity, material assets.
Aviation collision	Yes	Risk of loss of life and damage to Project infrastructure and other marine/land users.	Population and human health, biodiversity, material assets.

Hazard	Relevant for shortlist	Justification	Receptors
Accidental spills of hazardous material	Yes	The impacts relate to the scale of the spill and the type of hazardous material. Only large scale spills with the potential to cause considerable damage to the environment are scoped in for further assessment.	Population and human health, biodiversity, air quality, water quality, material assets and land.
Disturbance of UXO in Project area	Yes	Risk of loss of life and damage to Project infrastructure and other marine users.	Population and human health, biodiversity, material assets.
Workplace accident	Yes	Risk of loss of life and damage to Project infrastructure and other marine/land users.	Population and human health, biodiversity, material assets and land.

34.6.2 Stage 3

31. This assessment stage describes the likely significant effects that may occur from the hazards and classification of the likelihood that the events may occur. Mitigation measures for each hazard are considered. Several of the hazards identified are already covered in the relevant chapters of this ES, details of which are provided in the following sections.

34.6.2.1 Major fires

32. The risk of substation fires is low, however, substation fires can impact the supply of electricity and create a localised fire hazard. Given the location of the onshore substation any fire would not spread to settlement areas.
33. The highest appropriate levels of fire protection and resilience will be specified for the substation to reduce fire risks to ALARP. The small quantities of lubricants, fuel and cleaning equipment required during the operational phase of the Project will be stored in suitable facilities designed to the relevant regulations and policy design guidance.
34. As secured in the draft DCO (Document Reference 6.1), an offshore ERCOP will be developed following discussions with relevant stakeholders. These will include risk assessments and designated evacuation plans for workers in the unlikely event of fire breaking out.
35. Following the implementation of mitigation measures, the risk of the consequences meeting the threshold set out in Table 34.3 for the affected receptors is considered to be ALARP.

34.6.2.2 Exposed cables leading to vessel snagging

36. This hazard is relevant to the offshore project area, including array area, offshore cable corridor and landfall. The impacts, mitigation measures and evaluation of the residual risk resulting from this hazard are discussed in ES Chapter 15 Shipping and Navigation (Document Reference: 3.1.17).
37. A Cable Burial Risk Assessment will be developed post consent as part of the cable specification and installation plan secured in the draft DCO (Document Reference 6.1). The Cable Burial Risk Assessment will set out the installation methods that will be used to mitigate environmental and navigational issues. The Project will use cabling burial techniques, where practicable, for both the inter-array and export cables. This will enable a reduction in the potential for interactions between other marine users and the deployed cabling infrastructure associated with the Project. This is particularly important to enable the continuation of fishing activities in the locations where the cabling infrastructure has been buried.
38. The Project will seek cable crossing agreements with other cable operators where a cable crossing is required. The Project will comply with all cabling industry standards in locations where the Project cabling infrastructure will be buried. Cable protection will be monitored as per cable suppliers' recommendations. Further information on the intended pre-construction campaigns is outlined in ES Chapter 5 Project Description (Document Reference: 3.1.7). The risk of this hazard occurring is considered to be ALARP.

34.6.2.3 Vessel collision

39. This hazard is relevant to offshore project area. The impacts, mitigation measures and evaluation of the residual risk is discussed in ES Chapter 15 Shipping and Navigation (Document Reference: 3.1.17) and ES Chapter 18 Infrastructure and Other Users (Document Reference: 3.1.20) which also discusses the risk that the increased vessel movement to and from the site may pose to navigational safety during the construction and operational phases. Further detail is also provided in ES Appendix 15.1 Navigational Risk Assessment (Document Reference: 3.3.16).
40. The site selection process implemented by the Project avoided significant interactions with existing marine infrastructure within the offshore project area. This has been undertaken through a combination of consultation, desk-based research, and offshore surveys. This will reduce the potential of the Project's infrastructure interfering with existing marine infrastructure. A further detailed analysis of the site selection process has been provided in ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6).
41. Table 34.5 lists the mitigation measures embedded into the Project design to reduce Navigational Risk.

Table 34.5 Embedded mitigation measures for navigational risk

Mitigation	Description	How Mitigation is Secured
Lighting and Marking	A lighting and marking plan will be agreed with the MMO, in consultation with Trinity House, MCA, and the Civil Aviation Authority, and considering IALA G1162/O-139 (IALA, 2021).	DCO/deemed Marine Licence (dML) Condition.
Safety Zones	Application for safety zones during the construction phase and periods of major maintenance.	Application for safety zones will be made post consent under 'The Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007' (S.I. No 2007/1948).
Convention on International Regulations for Preventing Collisions at Sea (COLREGS) and International Convention for the Safety of Life at Sea (SOLAS)	Compliance by all Project vessels with COLREGS (IMO, 1972) and SOLAS (IMO, 1974).	International maritime law and flag state regulations.
Layout Approval	Layout will be agreed with the MMO in consultation with the MCA and Trinity House. These discussions will include how the layout will comply with MGN 654 (MCA, 2021) in terms of maintaining SAR access, and will give due consideration to the existing structures associated with Greater Gabbard.	DCO/dML Condition.

Mitigation	Description	How Mitigation is Secured
Spacing	Minimum crosswind spacing will be 944m, noting that minimum downwind spacing will be 1,180m.	DCO Requirement
MGN 654	Compliance with all aspects of MGN 654 including its annexes.	DCO/dML Condition.
Marine Coordination	Implemented to ensure management of Project vessel movements, to include the defining of entry / exit points into / out of the array area for Project vessels.	Secured within the OPEMP, Document Reference 7.6).
Emergency Response Cooperation Plan (ERCoP)	ERCoP in the required MCA format and structure and as required under MGN 654.	DCO/dML Condition (covered under MGN 654 compliance).
Promulgation of information	Advance warning and accurate location details of all construction, maintenance and decommissioning operations. This will include any associated Safety Zones and will be given via usual means including Notices to Mariners and Kingfisher Bulletins.	DCO/dML Condition.
Guard Vessels where Appropriate	Use of guard vessels were identified as necessary via risk assessment, as required under MGN 654.	DCO/dML Condition (covered under MGN 654 compliance).
Display on charts	Display of North Falls infrastructure (including cables) on appropriately scaled nautical charts.	DCO/dML Condition.
Cable Burial Risk Assessment	Assessment of required cable protection measures. This will form part of the cable specification and installation plan (secured by dML Condition) and will include proposed burial depths and cable protection (where necessary and permitted), noting this will include consideration of the DW routes used by deeper draught vessels locally.	DCO/dML Condition.
Buoyed construction area	The array construction/decommissioning area will be marked by buoyage as required and directed by Trinity House.	Construction buoyage in agreement with Trinity House.
Minimum blade clearance	There will be a minimum blade tip clearance of at least 27m above Mean High Water Springs (MHWS).	DCO/dML Condition (covered under MGN 654 compliance).
Navigation Installation Plan (NIP)	A NIP will be in place to manage cable installation and maintenance within the Inner and Outer Precautionary Areas. The NIP will be approved by the MMO, and will include: How information regarding cable installation and maintenance will be provided to Interested Parties and under what timelines; How the NIP will be updated and implemented throughout its lifespan;	DCO/dML Condition.

Mitigation	Description	How Mitigation is Secured
	<p>Details of anticipated activities and specific navigational procedures for individual activities;</p> <p>Contingency plans and emergency procedures; and</p> <p>Procedures for instances where cumulative works may be present.</p> <p>An outline plan is provided in Document Reference 7.25.</p>	

42. As secured in the draft DCO (Document Reference 6.1) an Emergency Response Co-operation Plan (ERCoP) will be developed. The ERCoP will include a response flow chart and detail how to report and respond to an environmental incident, including the measures available to contain/clean up an incident, manage dropped objects in the marine environment and offsite emergency response resources.
43. In terms of shipping and navigation risks, ES Appendix 15.1 Navigational Risk Assessment (Document Reference: 3.3.16) includes consideration of the potential allision, collision and re-routing both for the Project alone and cumulatively. All risks are assessed as ALARP.

34.6.2.4 Aviation collision

44. This hazard is relevant to offshore project area. The impacts, mitigation measures and evaluation of the residual risk is discussed in ES Chapter 17 Aviation and Radar (Document Reference: 3.1.19). Table 34.6 summarises the mitigation measures embedded into the Project design to reduce aviation risk.

Table 34.6 Embedded mitigation measures for aviation risk

Mitigation	Description
Information, notifications and charting	<p>North Falls would create an environment where obstacles can effectively be mitigated by compliance with appropriate international and national requirements for the promulgation of the obstacle locations on charts and in aeronautical documentation, together with the permanent marking and lighting of obstacles.</p> <p>Measures are:</p> <p>Issuing Notices to Airmen and Aeronautical Information Circulars and publicity in aviation publications</p> <p>In accordance with The Air Navigation Order 2016/765 Article 225A, details of the Project together with scheduled dates of commencement and completion of the works, would be notified in writing to the CAA for inclusion in the UK Aeronautical Information Publication and on relevant civil and military aeronautical charts, as notifiable permanent obstructions</p>
Lighting and Marking	<p>Measures are:</p> <p>Compliance with Trinity House painting requirements, MCA and MOD lighting requirements</p> <p>Compliance with Air Navigation Order 2016/765</p>

Mitigation	Description
	A Lighting Management Plan (LMP) must be agreed and implemented in consultation with the CAA
Regulatory requirements	<p>When construction is complete, the responsibility for avoiding other traffic and obstacles would rest with captains of civilian and military aircraft. This is outlined in CAA Official Record Series 4 No. 1496: (UK) Standardised European Rules of the Air – Exceptions to the Minimum Height Requirements (CAA, 2021)</p> <p>Pilots of military aircraft would be required to ensure that a Minimum Separation Distance of 250ft (76m) from any person, vessel, vehicle, or structure exists whilst operating in the vicinity of the North Falls array area. The charting and lighting of North Falls should also be taken into account by MoD low flying units and SAR operators.</p>

45. The OPEMP (Document Reference 7.6) will ensure the implementation of the measures listed above.

34.6.2.5 *Accidental spills of hazardous material*

46. During construction, operation and maintenance, and decommissioning the use of fuels will be required, and some chemicals may be required, as discussed in ES Chapter 5 Project Description (Document Reference: 3.1.7). Accidental spills of these substances has the potential to occur in both the offshore and onshore project areas.

47. The Applicant will commit to undertaking construction works in adherence with all relevant good practice guidance and legislation. The Applicant will also prepare all necessary plans in advance of construction activities. Where there is the potential for an accidental spill or leak, the focus will be on control measures that would be employed to reduce accidental releases to the environment. To ensure these are captured and implemented, the following outlined plans are submitted alongside the DCO application:

- OPEMP (Document Reference 7.6) developed prior to construction;
 - Including a Chemical Risk Assessment, Marine Pollution Contingency Plan (MPCP) and marine biosecurity plan;
- OCoCP (Document Reference 7.13); and
- Outline Horizontal Directional Drill Method Statement and Contingency Plan (Document Reference 7.15).

48. These plans will include measures for planning for accidental spills, address all potential contaminant releases and include key emergency contact details.

49. These documents will set out for approval, the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials into the environment. Measures to reduce instances of spills, remedial action, and response measures to be used in the event of a spill will be detailed. The MPCP will also detail measures for refuelling at sea.

50. These measures will prevent a release of hazardous material of a scale large enough to meet the thresholds set out in Table 34.3 for the affected receptors and the risk is considered to be ALARP.

34.6.2.6 *Disturbance of UXO in the project area*

51. UXO clearance works will be subject to separate marine licencing and therefore mitigation will be developed in consultation with relevant stakeholders as part of that process.

52. Pre-construction surveys in accordance with the draft DCO (Document Reference 6.1), will be implemented in the offshore project area to identify any potential hazards within the array area and offshore cable corridor. These will include geophysical surveys to identify seabed hazards such as UXO devices.

53. An Unexploded Ordnance Risk Mitigation Strategy will be developed post-consent and secured through a separate Marine Licence. It is anticipated to include the following strategies:

- Avoidance – a strategy of potential unexploded ordnance (pUXO) detection and avoidance is proposed as the most cost effective and efficient method of reducing UXO risks to ALARP. By surveying for and avoiding direct or indirect contact with any pUXO (the source of the risk) and by moving any intrusive activity away from such prospective hazards (where practicable), such risks are avoided.
- Removal of risk receptors – and alternative option is to remove the receptor element (of the source-pathway-receptor model), by moving certain sensitive and vulnerable receptors to a safe distance from the point of intrusive activity and thus the pUXO hazard, so that it will diminish sufficiently the prospective blast, fragmentation) the former and latter are through air effects) and/or shock wave (a through water effect) consequences in order to reduce UXO risks to ALARP.
- Removal of threat sources – where pUXO cannot be avoided, another alternative option, is to verify pUXO by investigation and where it is confirmed unexploded ordnance (cUXO) to remove it (effectively removing the source element of the source-pathway-receptor model) either by moving it to a position where it can do no harm (but only when it is safe to do so and wherever permit licensing and consent condition allow such actions), and/or by destroying it or otherwise rendering it safe.
- In high and medium risk zones, geophysical UXO survey is recommended prior to the commencement operations that are planned within the boundaries of the study area in order to provide the basis for a strategy of pUXO avoidance, or for its identification and removal.
- Surface detection for threat spectrum UXO should consist of either Side Scan Sonar, Multi Beam Echo Sounder and/or Work Class Remotely Operated Vehicle (subject to visibility and resolution, especially in areas where shallow water operations are planned) over the area of proposed operations and prior to their commencement.
- Sub-surface detection from threat spectrum UXO should also be undertaken ahead of seabed intrusive operations should consist of

magnetometer/gradiometer survey over the area of the proposed operations.

- Any vessels involved in intrusive works should be equipped with UXO specific emergency response plans, so that in the event of an unplanned UXO discovery the vessel Master and/or the offshore superintendent/party chief (or similar) are informed in advance about what safety actions must be taken.

54. With the mitigation in place, the risk of a major accident occurring due to this hazard is determined to be ALARP.

34.6.2.7 Workplace accidents

55. Lost Time Injury Frequency (LTIF) and Total Recordable Injury Rate (TRIR) are key indicators of the effectiveness of health and safety procedures. Globally, LTIF reduced 34% in 2022 compared to 2021, and TRIR reduced 16% (The Crown Estate, 2024). This trend was mirrored in the UK with both scores reducing, bringing the UK figures lower than the global average. This is despite the number of hours worked increasing by 6% in the UK. There were no fatalities in 2022, an indication that there is a strong adherence to process and procedure across the sector (The Crown Estate, 2024). G+¹ safety statics show there have been no fatalities globally in the offshore wind industry since 2016 (G+, 2023).

56. Workplace accidents which could lead to major accidents will be avoided by means of training of personnel and ensuring that all personnel have all required qualifications, that qualifications are maintained, and that regular project specific information (e.g. toolbox talks) is promulgated to staff. All equipment, plant and vessels will be fit for purpose and maintained as required. In addition to training, all necessary requirements for dealing with accidents (first aid equipment, firefighting equipment) would be in place to deal with workplace accidents/incidents.

57. The OPEMP (Document Reference 7.6) for offshore works and OCOCP (Document Reference 7.13) for onshore works, set out the health and safety principles to be followed by the Project.

58. With all of the above in place, the risk is considered to be ALARP.

34.6.3 Stage 4

59. At this stage, the mitigation measures are evaluated to ensure that risks from the hazards are sufficient to reduce risks to ALARP.

60. Mitigation measures are embedded into the construction, operation and maintenance and decommissioning phases of the Project, and alongside use of industry safety standards, will act to reduce the impacts on the relevant receptors identified during stage 3. With a commitment to the highest health and safety standards in design and working practices enacted, none of the

¹ G+ is the global health and safety organisation, bringing together the offshore wind industry to pursue shared goals and outcomes. They compile global datasets on health and safety.

anticipated construction works or operational procedures is expected to pose an appreciable risk of major accidents or disasters.

34.7 Summary

61. This chapter provides a screening and assessment of the major accidents and disasters with the potential to occur in relation to North Falls. Consideration of the LSE of potential major accidents and disasters has been carried out following available guidance and legislation.
62. A summary of the major potential hazards relating to the Project is presented in Table 34.7. The Potential Hazards assessed include: major fires, exposed cables leading to vessel snagging, vessels collision, aviation collision, accidental spills or hazardous material, disturbance of UXO in offshore project area and workplace accident. The residual risk for hazards scoped in for further assessment are considered to be ALARP and not significant in EIA terms.
63. Major accidents and disasters have the interacts with other receptors from the chapters outlined below:
 - ES Chapter 14 Commercial Fisheries (Document Reference: 3.1.16);
 - ES Chapter 15 Shipping and Navigation, (Document Reference: 3.1.17);
 - ES Chapter 17 Aviation and Radar, (Document Reference: 3.1.19);
 - ES Chapter 18 Infrastructure and Other Users, (Document Reference: 3.1.20); and
 - ES Chapter 28 Human Health, (Document Reference: 3.1.30).
64. Embedded mitigation in place to reduce the risk of major accidents and disasters is presented in Table 34.7.

Table 34.7 Summary of potential hazards relating to the Project

Hazard	EIA chapter(s) / document addressing this risk	Embedded mitigation	Risk of major accident or disaster after mitigation
Major Accidents			
Major fires	Assessed in Section 34.6.2.1.	Emergency response plans will be developed as secured in the draft DCO (Document Reference: 6.1). The plan will include risk assessments and designated evacuation plans for workers in the unlikely event of a fire breaking out.	ALARP. Not significant
Project Specific Risks			
Exposed cables leading to vessel snagging	ES Chapter 15 Shipping and Navigation (Document Reference: 3.1.17) Draft DCO (Document Reference 6.1) requiring a Cable Burial Risk Assessment	Cable Burial Risk Assessments will be developed to set out the installation methods. The Cable Burial Risk Assessment will also set out environmental and navigational issues. Cable burial techniques, where practicable, and the Project will comply with all cabling industry standards in locations where cabling infrastructure will be buried.	ALARP. Not significant
Vessel interactions (e.g. collision, allision)	ES Chapter 15 Shipping and Navigation (Document Reference: 3.1.17) and ES Appendix 15.1 Navigational Risk Assessment (Document Reference: 3.3.16)	Embedded mitigation detailed in Table 34.5: Application for safety zone; Cable Burial Risk Assessment; Display on charts; Guard vessels; Lighting and marking; Marine coordination; ERCoP; MGN compliance; Project vessel compliance with international marine regulations; Promulgation of information; and Crossing and proximity agreements.	ALARP. Not significant
Aviation collision	ES Chapter 17 Aviation and Radar (Document Reference:3.1.19)	Promulgation of obstacle location, together with permanent marking and lighting of obstacles; Aviation obstacle lighting; and Compliance with requirements for SAR.	ALARP. Not significant

Hazard	EIA chapter(s) / document addressing this risk	Embedded mitigation	Risk of major accident or disaster after mitigation
Accidental spills or hazardous material	OPEMP (Document Reference 7.6) OCoCP (Document Reference 7.13) Outline Horizontal Directional Drill Method Statement and Contingency Plan (Document Reference 7.15)	A PEMP will be produced and followed to cover the construction, operation and maintenance phases of the Project. This will include planning for accidental spills, address all potential contaminant releases and include key emergency contact details. The MPCP will set the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials. Measures to reduce instances of spills, remedial action and response measures to be used in the event of a spill or collision, and detail measures for refuelling at sea.	ALARP. Not significant
Disturbance of UXO in offshore project area	UXO clearance to be licenced separately	Pre-construction surveys; Development of an Unexploded Ordnance Risk Mitigation Strategy which will include mitigation strategies to avoid pUXO in the first instance, removing risk receptors or threat sources if required.	ALARP. Not significant
Workplace accident	Health and safety principles included in the OPEMP (Document Reference 7.6) and OCoCP (Document Reference 7.13).	Qualified staff; Appropriate and maintained equipment, plant and vessels; and Provision of first aid and safety equipment.	ALARP. Not significant

34.8 References

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