



Hornsea Project Four: Preliminary Environmental Information Report (PEIR)

Volume 4, Annex 4.7: Layout Principles

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Glossary

Term	Definition
Hornsea Four Array Area	Consented development area where surface infrastructure shall be installed.
Surface Infrastructure	Includes for the purpose of these principles wind turbines, substations, accommodation platforms and Bridge Linked Platforms.
Bridge Linked Platform	Surface Infrastructure connected by a bridge link; are assumed to be a single unit of Surface Infrastructure for the purpose of these principles.
Search and Rescue (SAR) Asset	Surface or air-based resource tasked to a SAR event.
Helicopter Refuge Area	Area that is clear of any Surface Infrastructure between surface Infrastructure. Helicopter Refuge Areas are not defined navigation corridors under the principles of Marine Guidance Note (MGN) 543.
Line of Orientation	Consistent transit lines on the same bearing throughout the Hornsea Four Array Area. The Lines of Orientation form the centre lines of the SAR Access Lanes.
SAR Access Lane	A defined lane which allows a SAR Asset to transit safely along a Line of Orientation through the Hornsea Four Array Area.
Internal Development Lane	A defined straight lane within which Surface Infrastructure shall be constructed.
Close Proximity	For the purpose of these rules close proximity for SAR assets is defined as no closer than 250 m minimum radius around any SAR Asset.
Perimeter Development Lane	Surface Infrastructure within a defined lane around the perimeter of the Hornsea Four Array Area in which infrastructure shall be constructed.

Acronyms

Acronym	Definition
MCA	Maritime & Coastguard Agency
MGN	Marine Guidance Note
MMO	Marine Management Organisation
SAR	Search and rescue
TH	Trinity House
WTG	Wind turbine generator

Units

Unit	Definition
km	kilometres
m	metres
nm	nautical miles

1. Introduction

- 1.2.1.1 Ørsted Hornsea Project Four Limited (the Applicant) is proposing to develop the Hornsea Four offshore wind farm (Hornsea Four). Hornsea Four will include both offshore and onshore infrastructure including offshore generating stations (wind turbines), electrical infrastructure (offshore substations) accommodation platform, electrical export cables to landfall and on to a connection to the electricity transmission network at National Grid Creyke Beck (see [Volume 1, Chapter 4: Project Description](#) for full details on the Project Design).
- 1.2.1.2 This Annex to the Project Description presents the proposed layout principles for Hornsea Four to facilitate the subsequent pre-construction discharge of Condition 12(1). The licenced activities must not commence until the following (insofar as relevant to that activity or phase of activity) has been submitted to and approved in writing by the MMO, in consultation with Trinity House (TH) and the Maritime & Coastguard Agency (MCA) (see Schedule 1 – Deemed Marine licence; Part 2 – Conditions (pre-construction plans and documentation) of the Draft DCO (see [Volume C, Annex 1.1](#)).

2. Background

- 2.2.1.1 The final layout of wind turbines, platforms and array cables will not be determined until after consent has been awarded for Hornsea Four. Hornsea Four has sought to develop a set of principles in accordance with which the final layout will be designed. The intention is to streamline the process of finalising the layout design by working closely with the MCA and TH on layout principles pre-consent which can be utilised to develop a safe and acceptable layout for the Hornsea Four offshore wind farm.
- 2.2.1.2 Layout principles are still being developed in collaboration with the MCA and TH, and all parties see the benefit of establishing a set of rules to expediate post consent agreements on layout. The intention of these principles is to ensure that the Marine Management Organisation (MMO) can easily sign-off the final layout by simply confirming that the final proposed layout complies with the principles, without the need to re-consult with the MCA. [Section 2](#) provides the layout principles that have been discussed with the MCA at the point of PEIR.
- 2.2.1.3 It should be noted that the establishment of these layout principles does not preclude additional principles from discussion. MCA and TH require final layout sign off in line with MGN 543 and its annexes.

3. Layout Principles

Table 1: Draft Hornsea Four Layout Principles.

Principle No.	Principle Description
Principle 1	All surface infrastructure shall be located within the Hornsea Four Array Area. No blade over sail or structural overhang is permitted outside of the Hornsea Four Array Area.
Principle 2	A minimum spacing of 810 metres (m) shall be maintained between the centre points of all Hornsea Four infrastructure.
Principle 3	The layout shall include Search and Rescue (SAR) access lanes to facilitate SAR asset access. These lanes shall be parallel to turbine rows on minimum one line of orientation within the Hornsea Four Array Area and shall satisfy the minimum width of 500 m required by Marine Guidance Note (MGN) 543 (MCA, 2016).
Principle 4	As per MGN 543, SAR access lanes shall allow a SAR asset to enter and exit the Hornsea Four Array Area without altering its heading or coming within a 250 m radius of any Hornsea Four surface infrastructure. The SAR access lanes shall have a consistent directional heading.
Principle 5	Perimeter type boundaries ¹ are permitted around the Hornsea Four Array Area, but they shall comply with Principles 2 and 3 .
Principle 6	<p>Surface Infrastructure shall be positioned up to 50 m from the centre defining a turbine row. This is a maximum distance and any micro-siting required due to geophysical and geotechnical constraints shall be included within this parameter and comply with Principles 2 and 3.</p> <p>If geophysical or geotechnical constraints prevent a structure from being positioned within 50 m of the line defining a turbine row then the distance may be increased up to 150 m in agreement with the MCA and TH, but the WTC position shall still comply with Principles 2, 3 and 4.</p>
Principle 7	Perimeter type boundaries around the Hornsea Four Array Area may be arranged in a curved line where required to manage the interrelationship with existing or proposed offshore infrastructure from third parties, but shall still comply with Principles 1, 2, 3 and 4 .
Principle 8	One Helicopter Refuge Area shall be included within the Hornsea Four Array Area where SAR access lanes exceed 10 nm length and shall be perpendicular to the SAR access lanes. The width of the Helicopter Refuge Area shall be 1 nm measured from the centre point of surrounding infrastructure to centre point of surrounding infrastructure and with the length covering the extent of the Hornsea Four Array Area.

¹ Perimeter type layouts – turbines on the perimeter of the array maintain minimum spacing, turbines internal to the array are at increased spacing.

4. References

MCA (2016). Marine Guidance Note 543 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response. Southampton: MCA.