Offshore Windfarms and other OREI

# Requirements for vessel corridors through large zones.

During early assessment of all aspects of Navigation Safety and considering the initial Round 1 and subsequently round 2 windfarms the issues of how far turbines need to be from a shipping route were considered.

The template included at Annex 3 of MGN 371, was eventually developed to give broad guidelines on what the limits should be. These early windfarms were, of course, relatively small when compared to the extensive plans for the round 3 sites and the considerations at that time need to be reviewed with the new developments under consideration.

Factors that must be considered:

* General location and level of bridge awareness during the passage.
* Size and manoeuvring characteristics of the vessels expected to transit the proposed lanes.
* Provisions that may be required with mechanical failure of vessels involved, including availability of support services.
* Expected constraints of weather, sea and tidal conditions that may be expected in the location.
* Other traffic, for example concentrations of fishing vessels, that will affect available sea-room to manoeuvre.
* Existence of Submarine cables and obstructions.
* Radar interference.

Appropriate marine expertise must be used to make a generic assessment of widths required which must then help to guide case by case situations.

**Location of the zone / traffic corridor**

The assessment of the required searoom required must take account the general location and sea area involved. The bridge manning, availability of engines for manoeuvre and readiness to use anchors will all vary when the vessel is on a general sea passage, as opposed to in areas of recognised constrained operation, for example port approaches and rivers.

**Manoeuvring Characteristics**

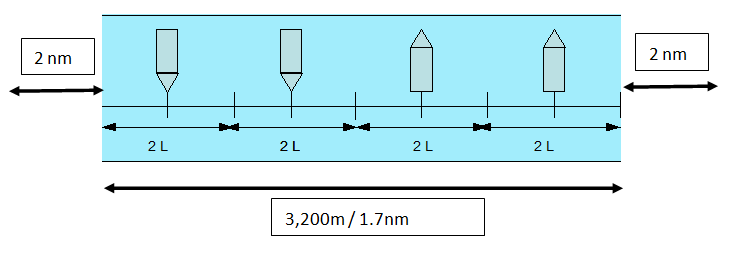
Standard turning circles for vessels are worked on 6 times the ship’s length. This is a particularly good assumption when vessels on ocean or deep sea passage will not have the same manoeuvrability as when engines and systems are prepared for port approach.

Requirements for stopping in an emergency must be considered, for example with a steering gear failure. The crash stop for a large tanker may be up to 3km.

Dutch Colleagues have also made an assessment of searoom required using data supported by the PIANC assessment for channel design. In general they strive for an obstacle free, or buffer, zone of 2nm between wind farms and shipping lanes.

The possibility of ships overtaking cannot be excluded and should be taken into consideration. Consequently the assumption should be that 4 ships should safely be able to pass each other.

A distance between overtaking and meeting vessels of 2 ship’s lengths is normally maintained as a minimum passing distance; this is based on the experience gained from ships’ masters and deep sea pilots operating in the North Sea and has been verified by simulation trials carried out in the Netherlands.



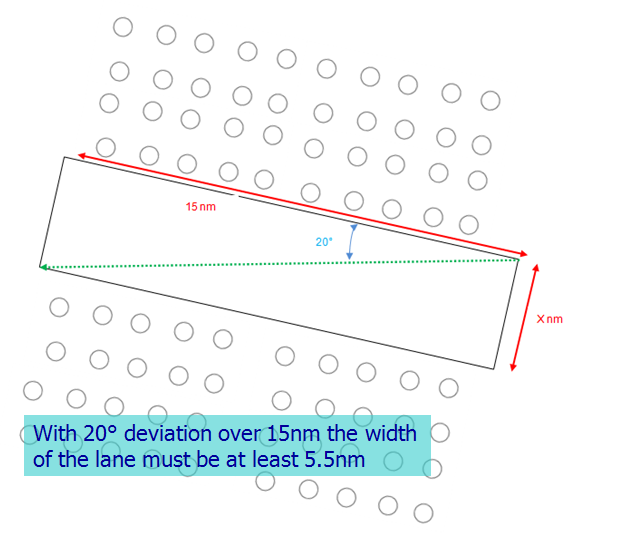
**Mechanical breakdown**

Engine failure whilst using a transit lane presents issues of requirements for emergency or unplanned anchoring together with the restrictions available searoom for other vessels.

Dependant on depth of water the swinging circle of very large vessels, when anchored, must be calculated to assess the searoom required.

**Weather, Sea, Swell and Tidal Conditions**

Unlike inshore and estuary areas, when on passage in exposed sea areas, for example offshore in the North Sea, it will not always be possible to make a course that is planned. Experience also shows that in heavy sea conditions it is also not possible to stop or turn the vessel around. Deviations from track by as much as 20°, or more, are common and must be considered.



**Other Marine users**

Concentrations of fishing vessels, or leisure traffic, will create requirements for manoeuvre and course alteration by other through traffic and also restrict searoom in the shipping lane. The risk of further vessel to vessel conflict will be consequently increased.

Displacing of one group of traffic into other users, in the already confined space available, must be considered, for example when leisure traffic is forced to use the same sea space as much larger and faster commercial vessels.

**Submarine cables**

The existence of submarine cables or other seabed obstructions may effect the ability of a vessel to anchor safely away from other traffic and this may be another consideration when assessing searoom requirements.

**Radar Interference**

Dependant on the proximity to wind turbine towers, and the location of radar scanners aboard the vessel, some vessels will experience degradation of the radar display by false echoes. It may be possible that this will reduce the ability of the bridge team to identify other vessels, including crossing vessels at the extremities of the lanes, which may require the taking of avoiding action. It is common to find that the radar instrumentation is adjusted to reduce the unwanted interference which can have the effect of reducing actual target acquisition.

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# Summary

To enable both the Renewable Energy Sector and the Mariner to operate in harmony, and safely, in-depth consideration must be given to assessing all risks presented by the new extensive round 3 windfarm sites.

The items noted in this paper are some of those factors to be considered in assessing the widths of traffic corridors, if these are planned for transit vessel traffic through the site. It should be possible to give broad guidelines but in every instance a case by case assessment, dependent on the particular circumstances, must also be carried out by marine experts to inform the Navigational Risk Assessments (NRA) and final decisions.