



**PIANC**

The World Association for  
Waterborne Transport Infrastructure

# Interaction between offshore wind farms and maritime navigation

## Terms of Reference

### 1. Historical Background - Definition of the problem

Increased activity within Europe's marine waters has led inevitably to growing competition for maritime space. Competing claims from a range of activities, including fisheries, leisure navigation locations allocated for military exercises, old ammunition dumps, navigation and anchoring areas, oil and gas exploitation, sand extraction and wind and wave energy generation are accompanied by increased pressure on vital marine ecosystems and habitats. Without the means to coordinate a common approach to the allocation of maritime space among different sectors, the problems of overlap and conflict between sectors and individual stakeholders is evident. There are also cross-border issues as developments in the maritime area of one country may well have impacts for another. The relatively new notion of Maritime Spatial Planning has emerged as a means of resolving conflicts over maritime space.

In order to increase the amount of environmentally friendly produced electrical energy, some coastal states decided that a significant part of the total yearly consumption has to be produced at sea favourably as close as possible to the shore in order to achieve as low as possible transportation losses. For these areas, which are situated between or near the shipping lanes, a conflict between shipping and the areas appears.

When a sea area of considerable size for the production of energy is to be located in a route junction or converging area of ships' routing or in any other way in the vicinity of ship's routing systems or shipping lanes, it is necessary to maintain the risk to shipping at a minimum but certainly not higher than the present level of risk. One of the relevant issues is that in some countries navigation within the borders of a windfarm is allowed; in that case crossing traffic can be expected to emerge from the windfarm.

### 2. Objective and product of the study

In order to ensure that a sea area for the exploitation of mineral resources or for the production of energy from water, currents or wind, will not interfere with sea lanes essential to international navigation or other

navigation activities and will not cause problem to electronic navigation aids, the Working Group aims at the development of a set of recommendations and guidelines for consideration to assess the sufficient manoeuvring space and the minimal distance between navigation and the offshore installations, making sure that the risk to shipping is acceptable.

The sufficient manoeuvring space and minimal distance will depend on various situations and criteria as:

- Traffic density
- Ships routing systems / precautionary areas
- Radar and VTS
- Size of ships including manoeuvring characteristics
- Recreational activities
- Fishing activities
- Available width of the [established] traffic lane
- Crossing traffic incoming from starboard in front of a windfarm
- Crossing traffic emerging from the windfarm
- Crossing traffic incoming from starboard behind of a windfarm
- The possibility of fishing vessels or other small craft being present in the area between windfarms and traffic lanes
- Weather conditions (wind and waves)
- Tidal current conditions
- The positioning of anchor areas
- Areas for (dis)embarkation of pilots
- Effects of windfarms on the ship's radar presentation

The Working Group will pay attention to international rules like the Collision Regulations and the General provisions on ships routing etc.

### 3. Previous PIANC reports

WG30 - Approach channels: A guide for design, 1997 (95)

WG49 - Horizontal and Vertical Dimensions of Fairways

### 4. Method of approach

- review of actual practice of distances between shipping and offshore windfarms so far by consultation of stakeholders,
- collect the available background information and review the approach taken,
- give considerations for determining the safe distance for different situations, according to the various uses of the sea, the size of the vessels, the layout of the shipping routes, anchorages, pilot stations etc.,
- review of recent developments in design tools (such as risk assessments and simulation techniques) in order to assess the appropriate manoeuvring space and minimal distance between shipping and windfarms in order to achieve safe navigation,

- develop risk-based considerations, recommendations and guidelines for assessing the sufficient manoeuvring space and the minimal distance between shipping and areas for windfarms, in order to ensure a minimal risk level for navigation.

#### 5. Suggested final product of the working group

The final report of the Working Group will provide an approach, guidelines and recommendations to assess the required manoeuvring space in the vicinity of offshore windfarms and the minimal distance between shipping lanes and sea areas for offshore windfarms, in order to ensure a minimal risk level for navigation.

#### 6. Desirable disciplines of the members of the Working Group

It is proposed this working group should include practising engineers engaged in maritime disciplines or responsible for design or use of maritime infrastructure; navigation captains.

#### 7. Relevance for countries in transition

The recommendations of the Working Group will be appropriate for the maritime spatial planning in countries in transition.