

# VESSEL ACCESS ALIGNED INTERFACES

OE-RP-02 THE WIND PARTNERSHIP

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## DEFINITIONS

CTV: Crew Transfer Vessel

W2W: Walk to Work vessel (DP2 vessel with gangway)

DP: Dynamic Positioning

## 1. INTRODUCTION

### 1.1. Introduction and purpose

This is a recommended practice for Vessel Access Aligned Interface. The document can be used as an appendix in a sales contract or as an addition to a complete recommended practice

The purpose of this document is to ensure that requirements to vessel access are aligned to enable industry requirements.

The recommendation will reduce time in the design / engineering process because of reduced need for clarification. In addition, there are also installation and operational savings when using CTV's, because there is no need for switching interfaces. It will also be that safety is increased because of standardized procedures.

The target group for the documents is buyers, designers and service suppliers.

### 1.2. Background

The need for this recommended practice was discussed and confirmed at a workshop in December 2016, following this it was included as a project in the wind partnership originally formed by Siemens Wind Power, MHI Vestas Offshore Wind and Vestas Wind Systems, on Offshoreenergy.dk's initiative.

The process is facilitated by Offshoreenergy.dk and funded by The Ministry of Higher Education and Science and The Southern Denmark Growth Forum.

## 2. GENERAL

This document is developed on the basis of existing guidelines and experience. Generally this document support the conclusions of *IMCA LR 006 Guidelines for Lifting Operations* in relation to Boat landings which also form basis of major parts of below. This document shall be considered a guideline and project specific considerations may apply.

## 3. BOAT LANDING

### 3.1. Design loads

- 3.1.1. The boat landing tubes shall be designed to accommodate a vessel of minimum 120 ton displacement in minimum 2 meter significant wave height.
- 3.1.2. Ship impact loads shall be according to DNVGL-ST-0437
- 3.1.3. Larger vessel shall be accepted subject to individual impact assessment fulfilling the design requirements.
- 3.1.4. The tubes shall be designed for a vessel landing on a single tube with up to 45 degree approach angle.
- 3.1.5. The boat landing tubes shall be designed so there is sufficient vertical strength in the structure to support high friction fendering of the vessels landing.

### 3.2. Boat landing tubes

- 3.2.1. The boat landing tubes shall be designed to avoid vessel fendering getting stuck on top of tubes either by extending the tubes to a sufficient length. Resting platforms if required should not extend further out than the outer tangent of the tubes.  
Recommendation is the tubes should extend 8 meters above HAT but subject to individual design risk assessment
- 3.2.2. The boat landing shall be designed to avoid smaller vessel or other object getting stuck underneath e.g. by rounding off the tubes at the end or extending sufficient length under LAT. Recommendation is 2 m below LAT but subject to individual design risk assessment.
- 3.2.3. The tubes shall preferably be designed as one continuous pipe. Should it be necessary to split the tubes into sections the gap between sections shall not exceed 20mm and the connections shall be placed out of the primary impact zones.
- 3.2.4. The orientation of the boat landing shall consider the predominant directions of current, wave and wind for the site to allow highest possible access to the turbines.

### 3.3. Access

- 3.3.1. Foundations should aim at maximum one boat landing access in accordance with the general design requirements.

### 3.4. Dimensions

3.4.1. General boat landing should have the following dimension

- Boat landing tube spacing 1.80m
- Tube diameter >0.355m
- Outer tangent of tube to centre of ladder rung 0.77m
- Ladder rung length 0.50m
- Foot clearance 0.20m

3.4.2. IMCA dimensions as 3.3.1 is preferred however if project specific considerations like e.g. neighbouring existing sites apply the range in Figure 1 is acceptable.

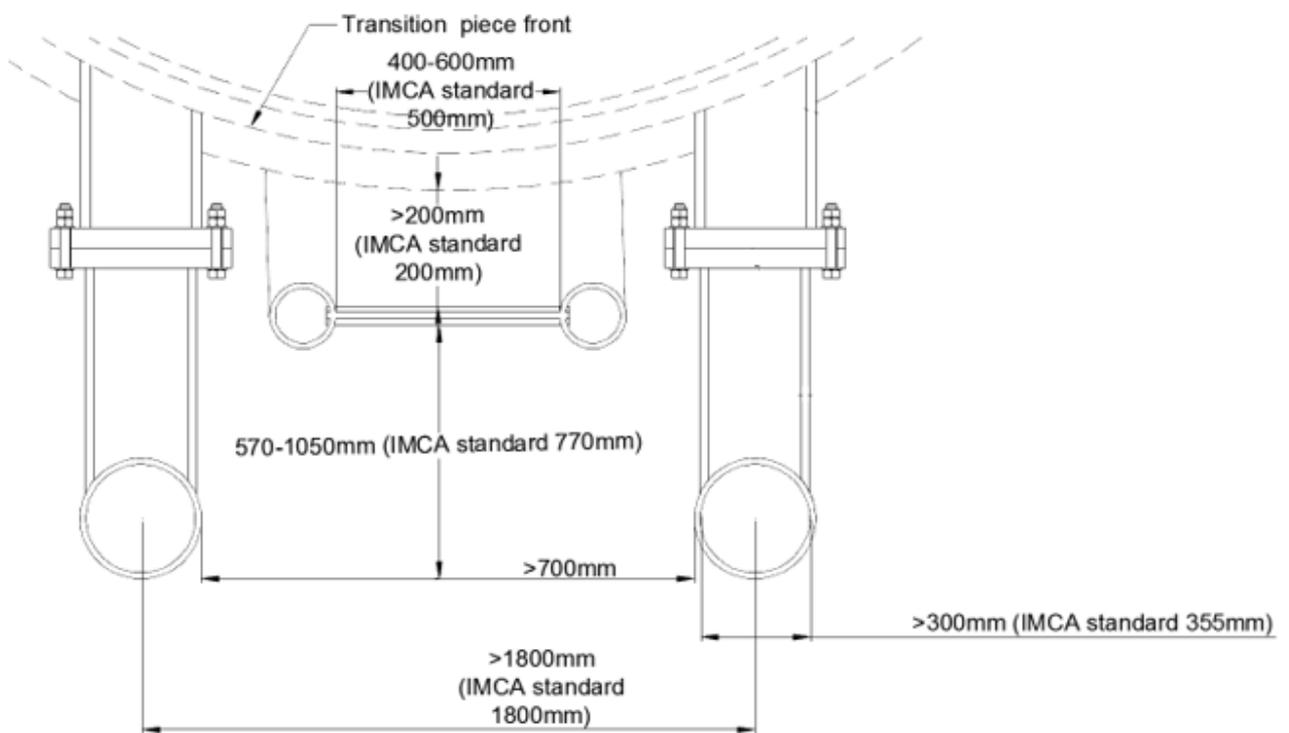


Figure 1 – Boat landing dimensions

## 4. ACCESS LADDER<sup>1</sup>

4.1.1. External access ladders shall be designed as fixed ladders with two side stringers

4.1.2. All rungs shall be designed for a concentrated load of at least 1,5kN at the centre of the rung such that the elastic deformation is limited to 2mm. Rungs on ladders systems shall be designed for a concentrated load of at least 10kN at the centre of the rung, in order to allow

<sup>1</sup> General reference to EN-14122-4

the usage of rungs as attachment points for the fall-arrest equipment while climbing the ladder

- 4.1.3. The rungs are required to be offshore diamond shaped with approximately 25mm to 30mm rungs and shall not be larger than a normal hand can span/grip fully around
- 4.1.4. The rungs shall be uniformly spaced at intervals not greater than 300mm and not less than 225mm. The width of the rungs shall not be less than 400mm and not more than 600mm preferable 500 mm the between stiles.
- 4.1.5. One rung on the ladder shall have the same level as the top of the grating of the access or resting platform.
- 4.1.6. The rung shall have a distance of at least 200mm from the foundation wall.
- 4.1.7. The ladder shall allow for installation of a fall arrest system 2,1 m above platform level of main platform and intermediate resting platform if applicable.

## 5. W2W ACCESS

### 5.1. Gates

- 5.1.1. The railing on the external working platform shall have three gates. When positioning these gates, the predominant wind/wave regime shall be taken into account allowing a W2W vessel possibility to head in various directions increasing workability.
- 5.1.2. The landings should be located 70-120 degrees apart to allow for free heading in most directions for a W2W vessel
- 5.1.3. There must be a clear area inside each landing point for access and cargo operation also considering the potential use of cargo trolleys.
- 5.1.4. Each gate shall have a width of minimum 1,4m
- 5.1.5. Due consideration shall be given to limit the potential gap in railing and the external platform railing/gate. Swing gates shall only be able to open inwards on the platform.
- 5.1.6. The gates shall be possible to open from the inside and outside
- 5.1.7. Gates must be lockable in both closed and open position
- 5.1.8. Area in front of gate must be kept clear of obstructions of all kinds, e.g. breakers, support and bolts.
- 5.1.9. There shall be a designated anchor point at each gate which as minimum shall fulfil requirements of EN 795, if beyond also fulfil fall protection systems requirements as per national and local legislations.

### 5.2. Gangway Landing Beam

- 5.2.1. An UNP 300 beam or similar beam with the same inner height and depth shall be attached/integrated to the external working platform at floor level for correct gangway positioning.
- 5.2.2. U-shaped beam should be sufficiently long for the expected bumper to be utilized. Minimum length is 1400mm the ends of the beams shall be closed.
- 5.2.3. U-shaped beam should be mounted in a way, that it will be possible to replace it from TP level.

5.2.4.Both ends should be closed with a welded head plate to avoid that the fender slides off the beam. Sharp edges at the landing beam must be rounded (min. R=2).

5.2.5.The impact force of the U-shaped beam shall be minimum 30kN

5.2.6.The beam should be clearly visible by colour (in contrast to the surrounding colour) or reflector tape

## 6. DP REFLECTORS

**4.1.** DP Laser beam reflectors with SOLAS Marine reflective tape or prisms shall be installed at each access point on every foundation with an orientation towards each of the W2W access landing points.

4.1.1.The reflectors shall be as a minimum be 110 mm wide and 800 mm long if on a tube and 200x300 if arranged as a patch.

4.1.2.Special consideration shall be taken in locating the reflectors to avoid interference from any reflective clothing of personnel on the platform.