Wind Turbine Installation Vessel - “OceanTec 1”

Type: Wind Turbine Installation Vessel
Vessel Name: ‘OceanTec 1’
Hull No: J006
Flag: Singapore
Class: American Bureau of Shipping (ABS) Classification “A1, Self-Elevating Drilling Unit, AMS, ACCU, DPII”

Owner: Teras Pneuma Pte. Ltd.
Builder: Nantong Jiaolong Heavy Industry Development Co., Ltd
Designer: Bennett & Associates Naval Architects & Marine Engineers JHI Singapore Pte. Ltd.

Country of Build: China
Completion: 3rd Quarter 2013

Length: 72.00 m, 75.75m including thruster appendage.
Breath: 38.00 m
Depth: 7.00 m
Load Line Draft: 4.0 m
Dist. Fwd to Aft Legs: 40.00 m
Dist. Port to Stbd Legs: 30.00 m
No of Tubular Legs: 4
Leg Length: 95 m
Diameter of Legs: 3.66 m
Accommodation: 58 persons in single cabins or 106 persons in single/double cabins. All cabins above Main Deck
Helicopter Deck (optional): Designed for Sikorsky S-61/S-92

Freshwater Tanks: 470 m³
Potable Water Tanks: 500 m³
Fuel Oil Tanks: 460 m³
Buffer Tank: 94 m³
Dirty Oil Tank: 51 m³
Contaminated Drain Tank: 56 m³
Trimming Tanks: 1170 m³ (*no preload tanks are required)
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**Lifting Equipment:**
One (1) Pedestal Mounted Crane (certified in accordance with ABS Guide for Cranes) with 75m boom:
- Main Hook @ 600MT @ 17~22m radius and 200MT @ 55m radius;
- Whip Hoist @ 40MT certified for man-riding.
Lifting height of 145m above water level in 40m of water depth with 3m leg penetration.

One (1) Articulating Arm Crane:
- Main Hook @ 600kg @ radius of 25m.

One (1) Retractable Walkway/Gangway:
- Extension of walkway up to 25m from side shell of vessel.

**Electric Rack & Pinion Jacking System:**
Total Normal Jacking Capacity of 7760MT.
- 1.2 m/min for jacking with load.
- 2.4 m/min for jacking without load.

**Propulsion & Positioning System:**
Three (3) 1000KW Azimuth thrusters and Three (3) 600KW Bow Tunnel thrusters driven by VFD technology.
- 9 knots travel speed, DP II Capabilities.

**Main and Auxiliary Engines:**
Four (4) sets of main diesel engine each rated at 1820eKW; total of 7,280eKW.
One (1) unit of emergency diesel engine rated at 550eKW.

**Design Loads:**
- Total Elevated Weight of Vessel: 6800MT
- Total Variable Load: 2600MT
- Deck Load: 2150MT
- Main Deck Loading: 7.5MT/m²; 10.0MT/m²

**Design Temperatures:**
- Steel Structure Design Temperature: -20 Deg C
- Min Air Temperature: -10 Deg C
- Max Air Temperature: +45 Deg C

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**Safety Systems/Equipment:**
Vessel is equipped with fire detection and fire-fighting systems in accordance with MODU requirements.
All accommodation areas protected by a sprinkler system.
Vessel is equipped with 2 x 106 men fully enclosed lifeboats and 1 x 300HP MOB rescue boat meeting SOLAS requirements.
5 x 25 persons life rafts shall be installed at port and stbd of vessel.

**Accommodation:**
Vessel has 58 single man cabins including dedicated cabins for senior officers.
48 single man cabins are convertible to double man cabins to provide 106 berths if required.
All cabins are located above Main Deck Level and have natural light.
Vessel is also equipped with Galley, Mess Rooms, Recreational Rooms, Linen Lockers Offices, Meeting Rooms, Gym, Laundry Room, Change Room and a 2 bedded Hospital.
Vessel is also equipped with a Store and Workshop.

**Machinery Systems:**
Vessel has a Zero Discharge System with an Oily Water Separator System installed.
Vacuum Sewage Treatment Plant for Grey and Black Water.
Fuel Oil Purifier.
Reverse Osmosis Water Maker.

**Control Systems:**
A Vessel Management System will be installed in accordance to ACCU requirements and also operational requirements.
Main Control Station is located on the Bridge Deck located on the 3rd level of the Port Accommodation Tower.
Secondary Control Station is located on Main Deck beside the 600MT Crane Pedestal.

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**Survival and Operating Conditions:**

<table>
<thead>
<tr>
<th>Wind Speed</th>
<th>@ Storm Survival</th>
<th>@ 36.01 m/s Wind</th>
<th>@ 23.15 m/s Wind</th>
<th>@ Operating Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Speed</td>
<td>51.44 m/s</td>
<td>36.01 m/s</td>
<td>23.15 m/s</td>
<td>18.52 m/s</td>
</tr>
<tr>
<td>Water Depth</td>
<td>30m</td>
<td>30m</td>
<td>50m</td>
<td>50m</td>
</tr>
<tr>
<td>Air Gap</td>
<td>15m</td>
<td>15m</td>
<td>27m</td>
<td>27m</td>
</tr>
<tr>
<td>Leg Penetration</td>
<td>3m</td>
<td>3m</td>
<td>3m</td>
<td>3m</td>
</tr>
<tr>
<td>Current</td>
<td>1.54 m/s</td>
<td>1.54 m/s</td>
<td>1.03 m/s</td>
<td>1.03 m/s</td>
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<tr>
<td>Wave Height</td>
<td>16.5m</td>
<td>17.4m</td>
<td>7.0m</td>
<td>8.0m</td>
</tr>
<tr>
<td>Wave Period</td>
<td>13.3 secs</td>
<td>14.0 secs</td>
<td>6.7 secs</td>
<td>7.1 secs</td>
</tr>
<tr>
<td>Variable Load</td>
<td>Partial</td>
<td>Partial</td>
<td>Full Load</td>
<td>Full Load</td>
</tr>
<tr>
<td>Crane Operations</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Up to Max Wind Speed of 20 m/s</td>
</tr>
</tbody>
</table>

Vessel can be positioned and jacked up for preload operations in at least 2m significant wave height, 1.03 m/s current, in water depths up to 50m and 18.52 m/s wind.