Claims

1. Method for installing a wind turbine blade to a nacelle of an offshore wind turbine, comprising the steps of:

- Providing a vessel or barge with a number of wind turbine blades and a blade installer unit comprising a blade receiving cart including a blade receiver;
- At the offshore wind turbine, bringing a boom of the blade installer unit towards a wind turbine tower of the wind turbine, in particular with respect to the vessel;
- Actuating a tower gripping device unit until the tower gripping device unit engages the tower;
- Inserting a blade into the blade receiving cart, that is positioned at a distance from an upper end of the boom, wherein the blade is in approximately horizontal position in the cart;
- Moving the blade receiving cart up, over the boom, towards the upper end of the boom of the blade installer unit;
- Rotating the blade receiver, with respect to the cart, with the blade until the blade is in approximately vertical position;
- Moving the blade with respect to the cart until the blade engages the nacelle for coupling to the nacelle.

2. Method according to claim 1, wherein the boom of the blade installer unit is aligned with the wind turbine tower.

3. Method according to claim 2, wherein the aligning of the boom comprises moving the boom with respect to a deck of the vessel using a skid by which the blade installer unit is movably mounted to the deck.

4. Method according to claim 3, wherein the skid is an XY-skid allowing for longitudinal movement and transverse movement over the deck with respect to the deck.

5. Method according to any of the preceding claims, wherein the boom of the blade installer unit is provided on a cantilever, which cantilever is movable with respect to a deck of the vessel, and can, in extended position, reach beyond the deck.

6. Method according to any of the preceding claims, wherein the blade is brought into a blade receiver of the blade receiving cart by a manipulator, in particular a crane, mounted on the vessel or barge.

7. Method according to any of the preceding claims, comprising extending the boom of the blade installer unit by moving an extendable boom portion outward with respect to a base boom portion of the boom.

8. Method according to claim 7, wherein the tower gripping device unit is folded out from the boom to engage with the wind turbine tower when the boom has been extended.

9. Method according to any of the preceding claims, comprising adjusting the boom angle of the boom.

10. Method according to any of the preceding claims, wherein the vessel or barge is a jack-up vessel, wherein the jack-up vessel is in elevated position while the blade installer unit engages the wind turbine.

11. Method according to any of the preceding claims, wherein the blade is coupled to the nacelle.

12. Blade installer unit for use in a method according to any of the preceding claims, configured to be mounted on a vessel or a barge, comprising a boom and a blade receiving cart for moving along the boom and a tower gripping device unit.

13. Vessel or barge, preferably jack-up vessel, provided with a blade installer unit according to claim 12.

14. Vessel or barge according to claim 13, further provided with a manipulator such as a deck crane for inserting the blade into the blade receiving cart in a method according to any of claims 1 – 11.

15. Combination of a vessel or barge according to claim 13 or 14, and a number of wind turbine blades, in particular in storage positions on a deck of the vessel or barge, for installation of the blades to a nacelle of an offshore wind turbine in the method according to any of claims 1 – 11.