A further object of the present invention is to provide a novel hull/pontoon for its application on a mono hull vessel for deploying and retrieving equipments in the offshore region which is stable and reliable in extremely hostile sea conditions.

In addition, the present invention discloses some advantageous features still not disclosed in prior art.

All through the specification including the claims, the words “vessel/unit”, “deck box”, “mono hull”, “ upper deck”, “lower deck”, “hull/pontoon”, “columns”, “temporary port” are to be interpreted in the broadest sense of the respective terms and includes all similar items in the field known by other terms, as may be clear to persons skilled in the art. Restriction / limitation, if any, referred to in the specification, is solely by way of example and understanding the present invention. Further, it should be understood to persons skilled in the art that the expressions “ship”, “ship shaped”, “ship like shape” according to the present invention should be interpreted as relating to all normal sailing vessels as known to persons skilled in the art. The present invention has been explained in this Complete Specification at places, with reference to “ship”, “ship shaped”, and “ship like shape” only for the sake of understanding and not by way of any limitation.

SUMMARY OF THE INVENTION

~~According to a first aspect of the present invention there is provided a mono hull vessel for retrieving and deploying equipments in offshore region comprising a deck box with an upper deck at its top said upper deck having a lifting and lowering facility, a hull/pontoon at the base of said vessel. According to the invention, hull/pontoon is connected to the deck box by a plurality of columns. The hull/pontoon is made in one piece and is continuous to form the platform for a lower deck. The upper and lower deck are configured to allow lifting and lowering of equipment therefrom and thereon respectively.~~

According to an advantageous embodiment of a first aspect of the present invention, the vessel is adapted to submerge and to move up the lower deck to and from a desired depth, below the water level.

Preferably, the columns are 4 to 10 in number and the assembly of the upper deck, the deck box, the lower deck are designed in coherence with the hull/pontoon which is similar to that of a ship and is submersible, to impart a ship like shape to said vessel in totality, whereby said vessel is adapted to function as a normal sailing vessel in non-submerged condition.

According to another advantageous embodiment of a first aspect of the present invention, the deck box has engine room, large space for said equipments, accommodation units and there is a helipad on said upper deck.

According to a further advantageous embodiment of a first aspect of the present invention, the hull/pontoon has ballast tanks, fuel tanks, FW tanks and thruster engine room and said lower deck also has a forecastle deck.

More preferably, the ballast tanks are provided in the lower hull and parts of said columns.

According to another advantageous embodiment of the first aspect of the present invention, the displacement in submerged condition of the vessel is approximately 45000 tons and loading capacity of said upper deck is 6000 to 8000 tons and the moon pool is arranged all the way from said upper deck to bottom hull.

According to another advantageous embodiment of the first aspect of the present invention, the vessel is provided at its aft region, with a temporary port unit for crew vessels or supply vessels or other vessels.

Preferably, the port unit comprises a sluice gate arrangement at end of said aft region and is provided with a sheltered area.

More preferably, the temporary port is adapted to be moored on a turret system.

The vessel according to the present invention is adapted to be applied as any one of or a combination of two or more of deep sea construction vessel, intervention vessel, construction vessel, drilling unit, Anchor Handling Tug Supply (AHTS), heavy lift vessel, windmill installation vessel, pipe layer, deep water mining vessel, accommodation unit, tender unit.

According to a second aspect of the present invention there is provided a method for submerging equipment(s) through water without subjecting the equipment and lifting/lowering devices to the dynamical forces of the splash zone in off shore region, said method comprising providing a mono hull column stabilized semi submersible vessel having a deck box with an upper deck at its top having a lifting and lowering device, a hull/pontoon at the base of said vessel which is similar to that of a ship hull and is submersible, said hull/pontoon being connected to the deck box by a plurality of columns, said hull/pontoon is made in one piece and is continuous to form the platform for a lower deck, the upper deck is configured to allow lowering of equipment therefrom on the lower deck, said vessel is adapted to submerge said lower deck to a desired depth below the water level in the event of placement of said equipment on the lower deck and to lift and lower said equipment from the lower deck so submerged, by virtue of said lifting and lowering device on the upper deck. According to the invention, the method involves:

a) placing said equipment(s) on said lower deck from said upper deck by said lifting and lowering facility,

b) submerging the lower deck to the desired depth below the water level,

c) applying the lifting device and lifting said equipment(s) partially above said lower deck,

d) turning said equipment(s) and lowering it in water by means of the lowering device.

According to a third aspect of the present invention there is provided a method for retrieving a submerged equipment(s) through water without subjecting the equipment and lifting/lowering device to the dynamic forces in the splash zone in

off shore region, said method comprising providing a mono hull column stabilized semi submersible vessel having a deck box with an upper deck at its top, said upper deck having a lifting and lowering device, a hull/pontoon at the base of said vessel which is similar to that of a ship and is submersible, said hull/pontoon being connected to the deck box by a plurality of columns, said hull/pontoon is made in one piece and is continuous to form the platform for a lower deck, the upper deck and lower deck are configured to allow lifting of equipment thereon. According to the invention, the method involves:

a) submerging said vessel such that the lower deck is at a desired depth below the water level,

c) lifting and placing said equipment(s) on said lower deck from water by said lifting and lowering device,

d) moving the vessel up the water such that the lower deck is above the water level.

According to a fourth aspect of the present invention, there is provided a hull/pontoon for its application on a mono hull vessel according to the first aspect of the present invention, for retrieving and deploying equipments in offshore region. According to the fourth aspect of the present invention, the hull/pontoon is made in one piece and is continuous to form the platform for a lower deck and said hull/pontoon is designed to have a shape as that of a ship hull.

SHORT DESCRIPTION OF THE FIGURES

Having described the main features of the invention above, a more detailed and non-limiting description of some exemplary embodiments will be given in the following with reference to the drawings, in which

Figure 1 is a perspective view of the mono hull vessel according to a preferred embodiment of the present invention.

According to the present invention there is provided a mono hull vessel for retrieving and deploying equipment in an offshore region comprising a deck box with an upper deck (2) at its top, said upper deck having a lifting and lowering device (3,3'), a hull (1) at the base of said vessel, characterized in that said hull (1) is connected to the deck box by a plurality of columns (4) and said hull (1) is made in one piece and is continuous to form the platform for a lower deck (5), the hull further comprising ballast tanks, said vessel being adapted to submerge said lower deck (5) to and from a desired depth below the water level, the upper and lower deck being configured to allow lifting and lowering of equipment therefrom and thereon respectively through the use of the lifting and lowering device (3,3') and/or by changing the depth of the lower deck below the water level, where a moon pool extends from said upper deck (2) through the deck box to the platform

of the lower deck (5) and that said columns (4) are 4 to 10 in number and said assembly of the upper deck (2) and the deck box are designed in coherence with the lower deck (5) and the hull (1), where the hull is a similar shape to that of a ship hull, to impart a ship like shape to said vessel in totality, whereby said vessel is adapted to function as a normal sailing vessel in non-submerged condition.

According to a first aspect of the present invention there is provided a mono hull vessel for retrieving and deploying equipments in offshore region comprising a deck box with an upper deck at its top said upper deck having a lifting and lowering device, a hull at the base of said vessel. According to the invention, hull is connected to the deck box by a plurality of columns. The hull is made in one piece and is continuous to form the platform for a lower deck. The upper and lower deck are configured to allow lifting and lowering of equipment therefrom and thereon respectively.

According to an advantageous embodiment of a first aspect of the present invention, the vessel is adapted to submerge and to move up the lower deck to and from a desired depth, below the water level.

Preferably, the columns are 4 to 10 in number and the assembly of the upper deck, the deck box, the lower deck are designed in coherence with the hull which is similar to that of a ship and is submersible, to impart a ship like shape to said vessel in totality, whereby said vessel is adapted to function as a normal sailing vessel in non-submerged condition.

According to another advantageous embodiment of a first aspect of the present invention, the deck box has engine room, large space for said equipments, accommodation units and there is a helipad on said upper deck.

According to a further advantageous embodiment of a first aspect of the present invention, the hull has ballast tanks, fuel tanks, FW tanks and thruster engine room and said lower deck also has a forecastle deck.

More preferably, the ballast tanks are provided in the lower hull and parts of said columns.

According to another advantageous embodiment of the first aspect of the present invention, the displacement in submerged condition of the vessel is approximately 45000 tons and loading capacity of said upper deck is 6000 to 8000 tons and the moon pool is arranged all the way from said upper deck to bottom hull.

According to another advantageous embodiment of the first aspect of the present invention, the vessel is provided at its aft region, with a temporary port unit for crew vessels or supply vessels or other vessels.

Preferably, the port unit comprises a sluice gate arrangement at end of said aft region and is provided with a sheltered area.

More preferably, the temporary port is adapted to be moored on a turret system.

The vessel according to the present invention is adapted to be applied as any one of or a combination of two or more of deep sea construction vessel, intervention vessel, construction vessel, drilling unit, Anchor Handling Tug Supply (AHTS), heavy lift vessel, windmill installation vessel, pipe layer, deep water mining vessel, accommodation unit, tender unit.

According to a second aspect of the present invention there is provided a method for submerging equipment(s) through water without subjecting the equipment and lifting/lowering devices to the dynamical forces of the splash zone in off shore region, said method comprising providing a mono hull column stabilized semi submersible vessel having a deck box with an upper deck at its top having a lifting and lowering device, a hull/pontoon at the base of said vessel which is similar to that of a ship hull and is submersible, said hull being connected to the deck box by a plurality of columns, said hull is made in one piece and is continuous to form the platform for a lower deck, the upper deck is configured to allow lowering of equipment therefrom onto the lower deck, said vessel is adapted to submerge said lower deck to a desired depth below the water level in the event of placement of said equipment onto the lower deck and to lift and lower said equipment from the lower deck so submerged, by virtue of said lifting and lowering device on the upper deck. According to the invention, the method involves:

a) placing said equipment(s) onto said lower deck from said upper deck by said lifting and lowering device,

b) submerging the lower deck to the desired depth below the water level,

c) applying the lifting device and lifting said equipment(s) partially above said lower deck,

d) turning said equipment(s) and lowering it in water by means of the lowering device.

According to a third aspect of the present invention there is provided a method for retrieving a submerged equipment(s) through water without subjecting the equipment and lifting/lowering device to the dynamic forces in the splash zone in off shore region, said method comprising providing a mono hull column stabilized semi submersible vessel having a deck box with an upper deck at its top, said upper deck having a lifting and lowering device, a hull/pontoon at the base of said vessel which is similar to that of a ship and is submersible, said hull being connected to the deck box by a plurality of columns, said hull is made in one piece and is continuous to form the platform for a lower deck, the upper deck and lower deck are configured to allow lifting of equipment thereon.

According to the invention, the method involves:

a) submerging said vessel such that the lower deck is at a desired depth below the water level,

c) lifting and placing said equipment(s) on said lower deck from water by said lifting and lowering device,

d) moving the vessel up the water such that the lower deck is above the water level.

According to a fourth aspect of the present invention, there is provided a hull/pontoon for its application on a mono hull vessel according to the first aspect of the present invention, for retrieving and deploying equipments in offshore region. According to the fourth aspect of the present invention, the hull is made in one piece and is continuous to form the platform for a lower deck and said hull/pontoon is designed to have a shape as that of a ship hull.

SHORT DESCRIPTION OF THE FIGURES

Having described the main features of the invention above, a more detailed and non-limiting description of some exemplary embodiments will be given in the following with reference to the drawings, in which

Figure 1 is a perspective view of the mono hull vessel according to a preferred embodiment of the present invention.

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1. (51)

A mono hull vessel for retrieving and deploying equipments in offshore region comprising a deck box with an upper deck (2) at its top said upper deck having a lifting and lowering device (3,3'), a hull (1) at the base of said vessel, characterized in that said hull (1) is connected to the deck box by a plurality of columns (4) and said hull (1) is made in one piece and is continuous to form the platform for a lower deck (5), the upper and lower deck being configured to allow lifting and lowering of equipment therefrom and thereon respectively, said vessel is adapted to submerge and to move up said lower deck (5) to and from a desired depth, below the water level, and

that said columns (4) are 4 to 10 in number and said assembly of the upper deck (2), the deck box, the lower deck (5) are designed in coherence with the hull which is similar to that of a ship hull and is submersible, to impart a ship like shape to said vessel in totality, whereby said vessel is adapted to function as a normal sailing vessel in non-submerged condition.

2.

The mono hull vessel according to claim 1 characterized in that amoon pool is arranged all the way from said upper deck (2) to bottom hull (1).

3

The mono hull vessel according to claim 1 or 2, characterized in that said vessel is provided at its aft region, with a temporary port unit (11) for crew vessels or supply vessels or other vessels (14).

4

The mono hull vessel according to claim 3 characterized in that said port unit (11) comprises a sluice gate arrangement (13) at end of said aft region and is provided with a sheltered area (12).

5

A method for submerging equipment(s) through water or retrieving a submerged equipment(s) through water without subjecting the equipment and the lifting/lowering device to dynamic forces in the splash zone, said method comprising providing a mono hull column stabilized semi submersible vessel having a deck box with an upper deck (2) at its top having a lifting and lowering facility (3,3'), a hull/pontoon (1) at the base of said vessel which is similar to that of a ship and is submersible, said hull (1) being connected to the deck box by a plurality of columns (4), said hull (1) is made in one piece and is continuous to form the platform for a lower deck (5), the upper deck (2) is configured to allow lowering of equipment (10) therefrom on the lower deck, said vessel is adapted to submerge said lower deck (5) to a desired depth below the water level in the event of placement of said equipment (10) on the lower deck (5) and to lift and lower said equipment from the lower deck so submerged, by virtue of said lifting and lowering device (3,3') on the upper deck, said method is characterized in that said submerging step includes the following sequence

a) placing said equipment(s) on said lower deck from said upper deck by said lifting and lowering facility,

b) submerging the lower deck to the desired depth below the water level,

c) applying the lifting device and lifting said equipment(s) partially above said lower deck,

d) turning said equipment(s) and lowering it in water by means of the lowering device.

5

A method according to claim 5, is characterized in that the retrieving step includes the following sequence

e) submerging said vessel such that the lower deck is at a desired depth below the water level,

f) lifting and placing said equipment(s) on said lower deck from water by said lifting and lowering facility,

g) moving the vessel up the water such that the lower deck is above the water level.

CLAIMS:

1. A mono hull vessel for retrieving and deploying equipment in an offshore region comprising a deck box with an upper deck (2) at its top, said upper deck having a lifting and lowering device (3,3′), a hull (1) at the base of said vessel, characterized in that said hull (1) is connected to the deck box by a plurality of columns (4) and said hull (1) is made in one piece and is continuous to form the platform for a lower deck (5), the hull further comprising ballast tanks, said vessel being adapted to submerge said lower deck (5) to and from a desired depth below the water level, the upper and lower deck being configured to allow lifting and lowering of equipment therefrom and thereon respectively through the use of the lifting and lowering device (3,3') and/or by changing the depth of the lower deck below the water level, where a moon pool extends from said upper deck (2) through the deck box to the platform of the lower deck (5) and that said columns (4) are 4 to 10 in number and said assembly of the upper deck (2) and the deck box are designed in coherence with the lower deck (5) and the hull (1), where the hull is a similar shape to that of a ship hull, to impart a ship like shape to said vessel in totality, whereby said vessel is adapted to function as a normal sailing vessel in non-submerged condition.

2. The mono hull vessel according to claim 1, where the lifting and lowering device comprises a crane (3) detachably attachable to a lifting arrangement (3').

3. The mono hull vessel according to claim 1 or 2, characterized in that said vessel is provided at its aft region, with a temporary port unit (11) for crew vessels or supply vessels (14), where the temporary port unit (11) comprises a ship shaped hull or a pontoon, where the temporary port unit is capable of forming a shallow port when the vessel is submerged.

4. The mono hull vessel according to claim 3 characterized in that said port unit (11) comprises a sluice gate (13) at an end of said aft region, providing a sheltered area (12).

5. A method for submerging equipment through water without subjecting the equipment and a lifting/lowering device to dynamic forces in a splash zone, said method comprising providing a mono hull column stabilized semi-submersible vessel having a deck box with an upper deck (2) at its top having a lifting and lowering device (3,3′), a hull (1) at the base of said vessel which is submersible, the vessel being ship shaped, said hull (1) being connected to the deck box by a plurality of columns (4), said hull (1) being made in one piece and being continuous to form the platform for a lower deck (5), the upper deck (2) being configured to allow lowering of equipment (10) therefrom onto the lower deck, said vessel being adapted to submerge said lower deck (5) to a desired depth below the water level in the event of placement of said equipment (10) onto the lower deck (5) and to lift and lower said equipment from the lower deck so submerged, by virtue of said lifting and lowering device (3,3′) on the upper deck, said method being characterized in that said submerging step includes the following sequence

a) placing said equipment onto said lower deck from said upper deck by said lifting and lowering device,

b) submerging the lower deck to the desired depth below the water level,

c) applying the lifting device and lifting said equipment partially above said lower deck,

d) turning said equipment and lowering it in water by means of the lowering device.

6. A method according to claim 5 further comprising a retrieval step for retrieving equipment through water, which includes the following sequence:

e) submerging said vessel such that the lower deck is at a desired depth below the water level,

f) lifting and placing said equipment(s) onto said lower deck from water by said lifting and lowering facility,

g) moving the vessel up in the water such that the lower deck is above the water level.