Claims

[Claim 1] Vessel (3, 70) for transporting a cold fluid, the vessel (3, 70) comprising:

a load-bearing structure comprising a hull (110) extending in a longitudinal direction and at least one transverse cofferdam (9, 19, 29) subdividing the hull into a plurality of segments, the one or each transverse cofferdam (9, 19, 29) comprising a pair of transverse bulkheads (7, 8, 17, 107, 109) defining an internal space (13, 23) of the transverse cofferdam (9, 19, 29) and an upper wall (37) closing said internal space (13, 23);

at least one sealed and thermally insulating tank (4, 71) disposed in a segment of the hull (110) adjacent to said transverse cofferdam (9, 19, 29);

a gas management installation for managing a gaseous atmosphere in the internal space (13, 23) of the transverse cofferdam (9, 19, 29), wherein the gas management installation comprises:

a dry air supply pipeline (30) comprising a first end located outside the transverse cofferdam (9, 19, 29) and connected to a dry air generator (31) supplying dry air, and a second end emerging into the internal space (13, 23) of the transverse cofferdam (9, 19, 29);

an intake valve (32) mounted on the dry air supply pipeline (30);

a gas discharge pipeline (33) comprising a first end emerging into the internal space (13, 23) of the transverse cofferdam (9, 19, 29) and a second end emerging outside the vessel (3, 70);

a discharge valve (34, 134) mounted on the gas discharge pipeline (33), the discharge valve (34, 134) being configured to open when a relative pressure in the internal space (13, 23) rises above a first threshold value;

a pressure sensor (35) configured to detect a relative pressure in the internal space (13, 23) of the transverse cofferdam;

a pressure regulator (36, 136) connected to the pressure sensor (35) and to the intake valve (32), the pressure regulator (36, 136) being configured to:

open the intake valve (32) to supply the dry air into the internal space (13, 23) of the transverse cofferdam (9, 19, 29) when the relative pressure in the internal space (13, 23) drops below a second threshold value, the second threshold value being a positive value lower than the first threshold value.

[Claim 2] Vessel according to Claim 1, wherein the pressure regulator (36, 136) is further configured to:

close the intake valve (32) when the pressure in the internal space (13, 23) rises above a third threshold value ranging between the second threshold value and the first threshold value.

[Claim 3] Vessel according to Claim 2, wherein a difference between the third threshold value and the second threshold value is less than 2kPa (20 mbarg).

[Claim 4] Vessel according to any of Claims 1 to 3, wherein the pressure regulator (136) is further connected to the discharge valve (34, 134), the pressure regulator (136) is further configured to:

open the discharge valve (34, 134) when the pressure in the internal space (13, 23) rises above the first threshold value.

[Claim 5] Vessel according to Claim 4, wherein the pressure regulator (36) is further configured to:

close the discharge valve (34) when the pressure in the internal space (13, 23) drops below a fourth threshold value ranging between the first threshold value and the second threshold value.

[Claim 6] Vessel according to Claim 5, wherein a difference between the fourth threshold value and the first threshold value is less than 2 kPa (20 mbarg).

[Claim 7] Vessel according to any of Claims 1 to 3, wherein the discharge valve (34, 134) is a mechanically opening and closing discharge valve (34, 134) configured to:

open when a relative pressure in the internal space (13, 23) rises above the first threshold value.

[Claim 8] Vessel according to any of Claims 1 to 7, wherein the second threshold value ranges between 1 kPa (10 mbarg) and 10 kPa (100 mbarg), preferably between 2 kPa (20 mbarg) and 5 kPa (50 mbarg).

[Claim 9] Vessel according to any of Claims 1 to 8, wherein the first threshold value ranges between 12 kPa (120 mbarg) and 18 kPa (180 mbarg), preferably between 13 kPa (130 mbarg) and 15 kPa (150 mbarg).

[Claim 10] Vessel according to any of Claims 1 to 9, wherein the gas management installation further comprises a gas bleed valve (18), the gas bleed valve (18) being mounted on the gas discharge pipeline (33), upstream of the discharge valve (34, 134) to allow a volume of gas to be drawn from the internal space (13, 23) of the transverse cofferdam.

[Claim 11] Vessel according to any of Claims 1 to 10, wherein the pair of transverse bulkheads (7, 8, 17, 107, 109) is manufactured from a steel grade selected from D grade, E grade, DH grade and EH grade.

[Claim 12] Vessel according to any of Claims 1 to 11, wherein the transverse cofferdam (9, 19, 29) comprises a thermal insulation (40) located in the internal space (13, 23) of the transverse cofferdam, the thermal insulation (40) preferably being attached on longitudinal

walls of the transverse cofferdam (9, 19, 29) including the upper wall (37) and a portion of the internal hull (15).

[Claim 13] Vessel according to any of Claims 1 to 12, wherein the transverse cofferdam (9, 19, 29) comprises a thermal insulator located on an outer surface of the cofferdam.

[Claim 14] Vessel according to Claim 12 or 13, wherein the thermal insulation (40) is a thermally insulating glass wool covered on an outer face by a metal foil.

[Claim 15] Transfer system for a cold liquid product, the system comprising the vessel (3, 70) according to any of Claims 1 to 14, insulated pipes (73, 79, 76, 81) arranged to connect the tank (4, 71) installed in the hull (110) of the vessel to a floating or onshore storage installation (77), and a pump for feeding a flow of the cold liquid product through the insulated pipes from or to the floating or onshore storage installation to or from the tank of the vessel.

[Claim 16] Method for loading or offloading the vessel (3, 70) according to any of Claims 1 to 15, wherein a cold liquid product is routed through insulated pipes (73, 79, 76, 81) from or to a floating or onshore storage installation (77) to or from the tank (4, 71) of the vessel (3, 70).