

【DESCRIPTION】

【TITLE OF THE INVENTION】

OFFSHORE CONSTRUCTION COMPRISING FLOW ATTENUATION
STRUCTURE

【TECHNICAL FIELD】

[1] The present disclosure relates to an offshore construction including a flow attenuation structure. More particularly, the present disclosure relates to an offshore construction including a flow attenuation structure for preventing seawater introduced into the offshore construction from overflowing onto a deck and reducing a resistance against the sailing of the offshore construction due to a moonpool.

【BACKGROUND ART】

[2] A drill ship is a vessel designed for use in exploratory offshore drilling of oil or gas. A drill ship allows collection of oil or gas in a deep sea where a platform can not be installed or a sea where the wave is severe.

[3] A drill ship has a moonpool at its center, which is an opening for sending a pipe for drilling down to the bottom of a sea. In addition, a variety of equipment for drilling is installed on the deck around the moonpool.

[4] The moonpool is very disadvantageous in terms of the stability or performance of sailing of the ship because seawater is introduced into the moonpool and it exerts resistance against the sailing of the ship.

[5] Further, if the frequency of the seawater introduced into the moonpool coincides with the frequency of the seawater inside the moonpool, they resonate in the moonpool such that the

seawater may overflow onto the deck. As a result, the equipment installed on the deck around the moonpool may be broken or damaged due to the impact pressure of the seawater.

[6] In order to solve such a problem, there has been proposed an approach to create flow of seawater under the block to prevent the flow of seawater into the moonpool, and to suppress the flow of the seawater introduced into the moonpool by using a perturbation control deck to reduce the resistance caused by the moonpool (see Korean Patent No. 10-1259718).

[7] Although the approach can suppress the flow of seawater in the moonpool while the drill ship is on sailing, it may not be effective to suppress the seawater introduced into the moonpool while the drill ship is stationary.

[8] Therefore, what is required is a structure that can prevent seawater introduced into the moonpool from overflowing onto the deck.

【SUMMARY OF INVENTION】

【Technical Problem】

[9] It is, therefore, an object of the present disclosure to provide an offshore construction including a flow attenuation structure capable of preventing seawater introduced into a moonpool from overflowing onto a deck of the offshore construction.

[10] It is to be understood that objects of the present disclosure are not limited to the above-mentioned object; and other objects of the present disclosure will be apparent to those skilled in the art from the following descriptions.

【Solution to Problem】

[11] According to an aspect of the present disclosure, there is provided an offshore construction including: a hull in which a moonpool is formed; and a flow attenuation structure configured to

damp flow inside the moonpool, wherein the flow attenuation structure comprises a first attenuation member that protrudes from a bottom of the offshore construction into the moonpool to divide an inner space of the moonpool into a first space and a second space.

[12] The first space may be formed closer to a stern of the offshore construction, while the second space may be formed closer to a bow of the offshore construction, and a length of the second space may be greater than a length of the first space.

[13] The first attenuation member may be at a lower level than the moonpool, and an offset space may be formed above the first attenuation member so that seawater introduced from the first space and seawater introduced from the second space are offset from each other.

[14] A first face of the first attenuation member that is in contact with the first space may be inclined, and a second face of the first attenuation member that is in contact with the second space may be parallel to an inner side surface of the moonpool.

[15] The distance between the first face and the second face of the first attenuation member may become smaller from a top to a bottom thereof.

[16] The offshore construction may further include: a guide member protruding from a deck of the offshore construction into the moonpool and configured to guide flow direction of seawater introduced into the first space so that the seawater flows into the offset space.

[17] The guide member may have an upward-slope from an inner side surface to an end of the moonpool.

[18] The offshore construction may further include: a second attenuation member protruding from a bottom of the offshore construction into the moonpool and spaced apart from the first attenuation member, wherein the second attenuation member divides the second space into a first partial space and a second partial space.

[19] The first partial space may be formed between the first space and the second partial space, and a length of the first partial space may be greater than a length of the second space and may be greater than a length of the second partial space

[20] The flow attenuation structure may further include a rear inclined plate disposed above the first attenuation member and inclined downward toward a front side, and a front inclined plate disposed above the second attenuation member and inclined downward toward a rear side.

[21] The offshore construction may further include: a rear guide plate disposed between water surface inside the moonpool and the first attenuation member and protruding from a rear side wall of the moonpool toward the front side; a front guide plate disposed between the water surface inside the moonpool and the second attenuation member and protruding from a front side wall of the moonpool toward the rear side.

[22] The offshore construction may further include: a triangular block disposed on a front side portion of the first attenuation member and having an upward-slope toward the front inclined plate.

[23] The flow attenuation structure may further include a front inclined plate disposed above the second attenuation member and inclined downward toward the rear side, a front guide plate disposed between the water surface inside the moonpool and the second attenuation member and protruding from the front side wall of the moonpool toward the rear side, a rear guide plate disposed between water surface inside the moonpool and the first attenuation member and protruding from the rear side wall of the moonpool toward the front side, and a baffle plate disposed between the water surface inside the moonpool and the rear guide plate and protruding from the rear side wall of the moonpool.

[24] According to another aspect of the present disclosure, there is provided an offshore construction including: a hull in which a moonpool is formed; and a flow attenuation structure configured to damp flow inside the moonpool ,wherein the flow attenuation structure comprises a

first attenuation member and a second attenuation member spaced apart from each other, a front inclined plate disposed above the second attenuation member and inclined down toward a rear side, a first baffle plate disposed between water surface inside the moonpool and the first attenuation member and protruding from a rear side wall of the moonpool toward a front side, and a second
5 baffle plate disposed above the water surface inside the moonpool and protrude from the rear side wall of the moonpool toward the front side, wherein the second attenuation member is in contact with a front side wall of the moonpool that it faces, and wherein the first attenuation member is in contact with a rear side wall of the moonpool that it faces.

10 **【Advantageous Effects】**

[25] According to some exemplary embodiments of the present disclosure, in an offshore construction including a flow attenuation structure, an open space of a moonpool is divided by a first attenuation member coupled with the moonpool into several spaces, so that seawaters introduced into the several spaces can be offset from one another.

15 [26] Accordingly, it is possible to prevent the seawaters introduced into the moonpool from overflowing onto the deck of the offshore construction, thereby preventing equipment installed around the moonpool from being damaged due to the impact pressure of the seawater.

[27] In addition, it is possible to reduce resistance against the offshore construction on sailing due to the moonpool, thereby improving the sailing efficiency of the offshore construction.

20 [28] It is to be understood that effects of some exemplary embodiments of the present disclosure are not limited to those described above and other effects will be apparent to those skilled in the art from the following descriptions.

【BRIEF DESCRIPTION OF DRAWINGS】

[29] FIG. 1 is a view showing an offshore construction having a flow attenuation structure according to an exemplary embodiment of the present disclosure;

[30] FIG. 2 is an enlarged perspective view of the flow attenuation structure of FIG. 1;

[31] FIG. 3 is a cross-sectional view showing the flow attenuation structure of FIG. 1;

5 [32] FIG. 4 is a view showing the size of the flow attenuation structure of FIG. 1;

[33] FIG. 5 is a graph showing the height of waves in the moonpool of an offshore construction having the flow attenuation structure according to an exemplary embodiment of the present disclosure;

10 [34] FIG. 6 is a cross-sectional view showing an offshore construction according to another exemplary embodiment of the present disclosure;

[35] FIG. 7 is a view showing a guide member of an offshore construction according to another exemplary embodiment of the present disclosure;

[36] FIG. 8 is a view schematically showing a part of an offshore construction according to yet another embodiment of the present disclosure;

15 [37] FIG. 9 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 8;

[38] FIG. 10 is a view showing results of Comparative Example of FIG. 9;

[39] FIG. 11 is a view showing an offshore construction according to yet another exemplary embodiment of the present disclosure;

20 [40] FIG. 12 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 11;

[41] FIG. 13 is a view showing an offshore construction according to yet another exemplary embodiment of the present disclosure; and

[42] FIG. 14 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 13.

【DESCRIPTION OF EMBODIMENTS】

5 [43] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. Those skilled in the art would easily understand that the accompanying drawings are merely illustrative and the scope of the present disclosure is not limited thereby.

[44] In the following description, although like terminologies and like reference numerals are
10 used to refer to the same or similar elements or functionality, it is to be noted that the elements are not completely identical to the elements of existing devices.

[45] The terminology used herein is merely for illustrative purposes and not intended to be limiting. As used herein, the singular forms are intended to include plural forms as well, unless the context clearly indicates otherwise. In the specification, it is to be noted that the terms
15 “comprising” or “including” and the like are not to be construed as necessarily including all of the several features, numbers, steps, operations, components or combinations thereof described in the specification. Rather, some of the several features, numbers, steps, operations, components or combinations thereof may not be included or additional several features, numbers, steps, operations, components or combinations thereof are construed as being further included.

20 [46] FIG. 1 is a view of an offshore construction including a flow attenuation structure according to an exemplary embodiment of the present disclosure. FIG. 2 is an enlarged perspective view of the flow attenuation structure of FIG. 1.

[47] Referring to FIGS. 1 and 2, a moonpool 100 may be formed by penetrating an offshore construction 50. A variety of equipments for drilling may be installed on a deck around the

deck. A pipe for drilling or the like may be extended down to the sea floor through the moonpool 100.

[48] As shown in FIGS. 1 and 2, the offshore construction having the flow attenuation structure according to an exemplary embodiment of the present disclosure includes a first attenuation member 200.

[49] The first attenuation member 200 may be installed in the moonpool 100 penetrating the offshore construction 50 and may protrude from the bottom of the offshore construction 50 into the moonpool 100 to divide the inside of the moonpool 100 into a first space 110 and a second space 120.

[50] Seawater may be introduced into the open space of the moonpool 100 from the bottom of the offshore construction 50. Accordingly, seawater may be introduced into the first space 110 and the second space 120 of the moonpool 100 from the bottom 80 of the offshore construction 50.

[51] The first space 110 may be formed closer to a stern 70 of the offshore construction 50, and the second space 120 may be formed closer to a bow 60 of the offshore construction 50.

[52] When the offshore construction 50 is traveling, seawater flowing along the bottom 80 of the offshore construction 50 may flow from the bow 60 to the stern of the offshore construction 50. Accordingly, the first attenuation member 200 may be coupled to the moonpool 100 so that it intersects with the flow direction of the seawater.

[53] Accordingly, when the offshore construction 50 is traveling, the seawater introduced into the second space 120 and the first space 110 from the bottom 80 of the offshore construction 50 may flow from the bow 60 to the stern 70 of the offshore construction 100 in the moonpool 100.

[54] In addition, when drilling is performed while the offshore construction 50 is stationary, seawater may be introduced into the first space 110 and the second space 120 by waves.

[55] The first attenuation member 200 is at a level lower than the moonpool 100. An offset space 130 may be formed above the first attenuation member 200 where the seawater flowing from the first space 110 and the seawater flowing from the second 120 are offset from each other.

[56] That is, according to the exemplary embodiment of the present disclosure, the first
5 attenuation member 200 is configured such that the seawater introduced into the first space 110 and the seawater introduced into the second space 120 are offset from each other in the offset space 130.

[57] To this end, as shown in FIG. 3, a first face 230 of the first attenuation member 200 that is in contact with the first space 110 may be inclined, and a second face 240 of the first attenuation
10 member 200 that is in contact with the second space 120 may be parallel to the inner side surface of the moonpool 100.

[58] The flow direction of the seawater introduced into the first space 110 along the first face 230 of the first attenuation member 200 may be different from the flow direction of the seawater introduced into the second space 120 along the second face 240 of the first attenuation member
15 200.

[59] The inclined first face 230 of the first attenuation member 200 may become closer to the second face 240 from the top face 210 to the bottom face 220. Accordingly, the seawater introduced into the first space 110 is moved toward the inner side surface of the moonpool 100 along the first face 230 of the first attenuation member 200 and then strikes the inner side surface
20 of the moonpool 100 to flow toward the offset space 130.

[60] On the other hand, the seawater introduced into the second space 120 along the second surface 240 of the first attenuation member 200 may flow from the second space 120 to the offset space 130.

[61] The seawater introduced into the first space 110 and the seawater introduced into the second space 120 flow into the offset space 130 in different directions, such that they are offset from each other in the offset space 130. As a result, it is possible to prevent the seawater from overflowing onto the deck D around the moonpool 100.

5 [62] Accordingly, it is possible to prevent the equipment installed on the deck D from being damaged by the impact pressure by the seawater.

[63] In addition, according to the exemplary embodiment of the present disclosure, the seawaters introduced into the moonpool 100 are offset from each other in the offset space 130, thereby reducing the resistance against the sailing of the offshore construction 50 caused by the moonpool 100. As a result, the sailing efficiency of the offshore construction 50 can be improved.

10 [64] As shown in FIG. 4, the height and length of the first attenuation member 200 may vary depending on the size of the equipment to be installed in the offshore construction 50 or the size of the offshore construction 50.

[65] That is, a variety of equipment may be installed above the first attenuation member 200 depending on the operation performed out in the moonpool 100.

[66] Accordingly, the first space 110 is formed to be smaller than the second space 120, so that the first attenuating member 200 is installed closer to the inner side surface of the moonpool 100 forming the first space 110, and accordingly equipment can be readily installed above the first attenuation member 200.

20 [67] In addition, the second space 120 is formed to be large, so that a riser pipe or the like for drilling may be extended down to the bottom of the sea through the second space 120.

[68] For example, the height h_2 of the first attenuation member 200 may range from 20% to 80% of the height h_1 of the moonpool. The length L_1 from the inner side surface of the moonpool 100 to the first face 230 of the first attenuation member 200 may range from 30% to 70% of the

length L2 from the inner side surface of the moonpool 100 to the second face 240 of the first attenuation member 200.

[69] Accordingly, the length of the first attenuation member 200 may be equal to the difference between the length L2 and the length L1.

5 [70] The length L2 from the inner side surface of the moonpool 100 to the second face 240 of the first attenuation member 200 may occupy 20% to 80% of the length L of the moonpool 100.

[71] Incidentally, as described above, the first face 230 of the first attenuation member 200 may be inclined so as to guide the movement path of seawater. Accordingly, as shown in FIG. 4, the inclination angle $\theta 1$ of the first face 230 of the first attenuation member 200 with respect to
10 the top face 210 of the first attenuation member 200 may range from 30 degrees to 90 degrees.

[72] That is, the size of the first attenuation member 200 may be adjusted depending on the size of the offshore construction 50 or the size of the moonpool 100 and the drilling equipment to be used.

[73] FIG. 5 is a graph showing the height of waves in the moonpool of a ship having the flow
15 attenuation structure according to an exemplary embodiment of the present disclosure. In FIG. 5, an offshore construction without the first attenuation member 200 in the moonpool is compared to the offshore construction 50 with the first attenuation member 200 in the moonpool 100.

[74] Specifically, referring to FIGS. 3 to 5, assuming that the height of the deck is 6 m, the seawaters are introduced into the moonpool 100 and resonate at a specific frequency to overflow
20 onto the deck D. In the moonpool where the first attenuation member 200 is not provided, the seawater may overflow onto the deck D with the maximum height of 2 m (H1).

[75] In contrast, in the moonpool 100 where the first attenuation member 200 is provided, the height H2 of the seawater is below 0 m, and thus does not overflow onto the deck D.

[76] As such, according to the exemplary embodiment of the present disclosure, the flow attenuation structure has the first attenuation member 200 in the moonpool 100 to thereby prevent the seawater introduced into the moonpool 100. As a result, it is possible to prevent equipment installed on the deck D around the moonpool 100 from being damaged due to the impact pressure of the seawater.

[77] FIG. 6 is a cross-sectional view of an offshore construction according to another exemplary embodiment of the present disclosure.

[78] As shown in FIG. 6, a flow attenuation structure may include a moonpool 100 and a first attenuation member 200.

[79] The moonpool 100 and the first attenuation member 200 according to this exemplary embodiment are substantially identical to those of the exemplary embodiment described above with reference to FIGS. 1 to 4; and, therefore, the redundant description will be omitted.

[80] It is to be noted that the flow attenuation structure may further include a guide member 300, as shown in FIG. 6

[81] The guide member 300 protrudes from a deck D of the offshore construction 50 into the moonpool 100. It may guide the flow direction of seawater introduced into a first space 110 into an offset space 130.

[82] That is, the seawater introduced into the first space 110 along the first attenuation member 200 may flow into the offset space 130 along the guide member 300.

[83] The guide member 300 may have an upward-slope from the inside to the end of the moonpool 100.

[84] FIG. 7 is a view showing the guide member of the offshore construction according to the exemplary embodiment.

[85] As shown in FIG. 7, a bottom surface 300a of the guide member 300 may form an inclination angle θ_2 of 70 degrees or less with respect to the horizontal surface of the deck D.

[86] As shown in FIG. 6, the seawater introduced into the first space 110 may flow into the moonpool 100 along a first face 230 of the first attenuation member 200, may strike the inner side surface of the moonpool 100, and then may flow into the offset space 130 along the bottom surface 300a of the guide member 300.

[87] The seawater introduced into the offset space 130 along the guide member 300 may be offset by the seawater introduced into the offset space 130 from the second space 120.

[88] As described above, in the offshore construction according to some exemplary embodiments of the present disclosure, the flow attenuation structure includes the first attenuation member 200. As the guide member 300 guides the flow direction of the seawaters introduced into the moonpool 100, the seawaters can be offset from each other in the offset space 130 in the moonpool 100.

[89] By preventing the seawater from overflowing onto the deck D from the moonpool 100, it is possible to prevent the equipment installed on the deck around the moonpool 100 from being damaged due to the impact pressure of the seawater.

[90] In addition, when the offshore construction 50 travels, resistance against the sailing of the offshore construction 50 due to the moonpool 100 can be reduced.

[91] FIG. 8 is a view schematically showing a part of an offshore construction according to yet another exemplary embodiment of the present disclosure. It is to be noted that the right hand of FIG. 8 is the front side (the bow) of an offshore construction (for example, a drill ship) 1001, and the left hand of FIG. 8 is the rear side (the stern) of the offshore construction 1001.

[92] Referring to FIG. 8, the offshore construction 1001 includes a hull 1010 and a flow attenuation structure 1100.

[93] A moonpool 1020 is formed in the hull 1010. The moonpool 1020 is an opening for sending a drilling pipe (not shown) below the hull 1010 and is formed by penetrating the hull 1010 in the vertical direction.

[94] The flow attenuation structure 1100 damps the flow inside the moonpool 1020.

5 [95] The flow attenuation structure 1100 may include a second attenuation member 1110 and a first attenuation member 1120. The second attenuation member 1110 is located below the water surface inside the moonpool 1020 and disposed closer to the front portion, i.e., the bow. The first attenuation member 1120 is located below the water surface inside the moonpool 1020 and disposed closer to the rear portion, i.e., the stern.

10 [96] The second attenuation member 1110 and the first attenuation member 1120 effectively damp the up-and-down movement of the water inside the moonpool 1020. In other words, the second attenuation member 1110 and the first attenuation member 1120 damp the up-and-down movement of the water by converting a part of the vertical kinetic energy of the water inside the moonpool 1020 into horizontal kinetic energy.

15 [97] The second attenuation member 1110 and the first attenuation member 1120 are spaced apart from each other. A drilling pipe is sent down through the space between the second attenuation member 1110 and the first attenuation member 1120.

[98] According to the exemplary embodiment of the present disclosure, the second attenuation member 1110 is disposed spaced apart from the front side wall of the moonpool 1020. The first
20 attenuation member 1120 is disposed spaced apart from the rear sidewall of the moonpool 1020. A space (hereinafter referred to as a second partial space 1032) is formed between the second attenuation member 1110 and the front side wall of the moonpool 1020, and a space (hereinafter referred to as a first partial space 1033) is formed between the first attenuation member 1120 and the rear side wall.

[99] The vertical movements of the water introduced into the moonpool 1020 through the first partial space 1031, the second partial space 1032 and the first space 1033 is converted into the horizontal movements by the second attenuation member 1110 and the first attenuation member 1120. In doing so, the horizontal movements of the water can be damped due to superposition.

5 [100] The flow attached structure 1100 may further include a front inclined plate 1130 and a rear inclined plate 1140. The front inclined plate 1130 is disposed above the second attenuation member 1110 and is inclined downward toward the rear side. The rear inclined plate 1140 is disposed above the first attenuation member 1120 and is inclined downward toward the front side. The front inclined plate 1130 and the rear inclined plate 1140 damp water waves inside the
10 moonpool 1020.

[101] The flow attenuation structure 1100 may further include a front guide plate 1150 and a rear guide plate 1160.

[102] The front guide plate 1150 is located between the water surface inside the moonpool 1020 and the second attenuation member 1110 and protrudes backward from the front side wall of the
15 moonpool 1020. The rear guide plate 1160 is located between the water surface inside the moonpool 1020 and the first attenuation member 1120 and protrudes forward from the rear side wall of the moonpool 1020.

[103] The front guide plate 1150 and the rear guide plate 1160 guide the water coming through the second partial space 1032 and the first space 1033 so that it flows horizontally. As a result,
20 the vertical movements of the water inside the moonpool 1020 are damped.

[104] In addition, the flow attenuation structure 1100 may further include a triangular block 1170. The triangular block 1170 is disposed on the front side portion of the first attenuation member 1120, and has an upward-slope toward the front inclined plate 1130.

[105] The triangular block 1170 changes the direction of the water introduced into the moonpool 1020 toward the front inclined plate 1130, and the water waves generated in doing so are broken by the front inclined plate 1130.

[106] FIG. 9 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 8. FIG. 10 is a graph showing Comparative Example with respect to Experimental Example of FIG. 9.

[107] In the graphs shown in FIGS. 9 and 10, the horizontal axis represents the frequency of vertical movements of water inside the moonpool, and the vertical axis represents the height of the water surface at the central portion inside the moonpool. In Comparative Example of FIG. 10, the inside of the moonpool is empty. The results of the experiments of FIGS. 9 and 10 may be, but is not limited to, derived through model experiments.

[108] It can be seen from FIG. 10 that, in Comparative Example where the inside of the moonpool is empty, the vertical movements inside the moonpool become significant between approximately 0.1 Hz and 0.12 Hz.

[109] In contrast, it can be seen from FIG. 9 that, in Experimental Example where the flow attenuation structure 1100 according to the exemplary embodiment of the present disclosure is installed in the moonpool 1020, the vertical movements inside the moonpool 1020 become weak throughout the entire frequency ranges, unlike FIG. 10.

[110] FIG. 11 is a view showing a flow attenuation structure according to yet another exemplary embodiment of the present disclosure. Referring to FIG. 11, the flow attenuation structure 1200 includes a second attenuation member 1210, a first attenuation member 1220, a front inclined plate 1230, a front guide plate 1250, a rear guide plate 1260, a baffle plate 1270.

[111] The second attenuation member 1210, the first attenuation member 1220, the front inclined plate 1230, the front guide plate 1250 and the rear guide plate 1260 are identical to the

second attenuation member 1110, the first attenuation member 1120, the front inclined plate 1130, the front guide plate 1150 and the rear guide plate 1160; and, therefore, the redundant description will be omitted.

[112] The baffle plate 1270 damps the water waves inside the moonpool 1020.

5 [113] FIG. 12 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 11. Comparative Example of FIG. 10 is also used for Experimental Example of FIG. 12.

[114] Referring to FIGS. 11 and 12, it can be seen that, in Experimental Example where the flow attenuation structure 1200 according to the exemplary embodiment of the present disclosure is
10 installed in the moonpool 1020, the vertical movements inside the moonpool 1020 become weak throughout the entire frequency ranges, unlike FIG. 10.

[115] FIG. 13 is a view showing a flow attenuation structure according to yet another exemplary embodiment of the present disclosure. Referring to FIG. 13, the flow attenuation structure 1300 includes a second attenuation member 1310, a first attenuation member 1320, a front inclined plate
15 1330, a first baffle plate 1371, and a second baffle plate 1372.

[116] The second attenuation member 1310 is disposed in contact with the front side wall of the moonpool 1020 that it faces. Further, the first attenuation member 1320 is disposed in contact with the rear side wall of the moonpool 1020 that it faces. Accordingly, the second partial space 1032 and the first space 1033 of FIG. 8 are eliminated.

20 [117] The front inclined plate 1330 is disposed above the second attenuation member 1310 and is inclined downward toward the rear side. The front inclined plate 1330 damps the water waves inside the moonpool 1020.

[118] The baffle plate 1371 is located between the water surface inside the moonpool 1020 and the first attenuation member 1320 and protrudes forward from the rear side wall of the moonpool 1020. The first baffle plate 1371 prevents sloshing inside the moonpool 1020.

[119] The second baffle plate 1372 is located above the water surface inside the moonpool 1020 and protrudes forward from the rear side wall of the moonpool 1020. The second baffle plate 1372 prevents sloshing inside the moonpool 1020.

[120] FIG. 14 is a graph showing results of Experimental Example of the flow attenuation structure of FIG. 13. Comparative Example of FIG. 10 is also used for Experimental Example of FIG. 14.

[121] Referring to FIGS. 13 and 14, it can be seen that, in Experimental Example where the flow attenuation structure 1300 according to the exemplary embodiment of the present disclosure is installed in the moonpool 1020, the vertical movements inside the moonpool 1020 become weak throughout the entire frequency ranges, unlike FIG. 10.

[122] Although several exemplary embodiments of the present disclosure have been described, it will be apparent to those skilled in the art that other exemplary embodiments can be made without departing from the spirit and scope of the claimed subject matter. Therefore, it will be understood that the above-described exemplary embodiments are not intended to limit the scope of the present disclosure but are illustrative. Accordingly, the exemplary embodiments may be modified within the scope of the appended claims and equivalents thereof.

[123] [Brief Description of Reference Numerals]

[124] 50: offshore construction

60: bow

[125] 70: stern

80: bottom of offshore construction

[126] 100: moonpool

110: first space

[127] 120: second space

130: offset space

	[128]	200: first attenuation member	210: top face
	[129]	220: bottom	230: first face
	[130]	240: second face	300: guide member
	[131]	300a: bottom of guide method	D: deck
5	[132]	H1: height without first attenuation member	H2: height with first attenuation member
	[133]	h1: height of moonpool	h2: height of first attenuation member
	[134]	L: length of moonpool	L1: length of first attenuation member to first face
	[135]	L2: length of first attenuation member to second face	$\Theta 1$: inclination angle of first
10		attenuation member	
	[136]	$\Theta 2$: inclination angle of guide member	
	[137]	1001 : offshore construction	1010 : hull
	[138]	1020 : moonpool	1100 : flow attenuation structure
	[139]	1110 : second attenuation member	1120 : first attenuation member
15	[140]	1130 : front inclined plate	1140 : rear inclined plate
	[141]	1150 : front guide plate	
	[142]	1160 : rear guide plate	
	[143]	1170 : triangular block	

WHAT IS CLAIMED IS:

1. A drill ship comprising:
 - a hull in which a moonpool is formed; and
 - a flow attenuation device configured to damp flow inside the moonpool, wherein the flow attenuation device includes:
 - a front deck block located below a water surface inside the moonpool and disposed at a front portion inside the moonpool;
 - a rear deck block located below the water surface inside the moonpool, spaced apart from the front deck block and disposed at a rear portion inside the moonpool;
 - a front guide plate located between the water surface inside the moonpool and the front deck block, and protruding rearward from a front sidewall of the moonpool; and
 - a front inclined plate disposed above the front deck block and inclined downward toward a rear side,
 - wherein the front deck block is spaced apart from the front sidewall of the moonpool facing the front deck block,
 - wherein the rear deck block is spaced apart from a rear sidewall of the moonpool facing the rear deck block, and
 - wherein at least a portion of the front inclined plate overlaps the front deck block, and the front guide plate is disposed between the front inclined plate and the front deck block.
2. The drill ship of claim 1, wherein the flow attenuation device is disposed above the rear deck block, and further includes a rear inclined plate inclined downward toward a front side.
3. The drill ship of claim 2, wherein the flow attenuation device further includes:
 - a rear guide plate located between the water surface inside the moonpool and the rear deck block, protruding forward from the rear sidewall of the moonpool, and disposed between the rear inclined plate and the rear deck block.
4. The drill ship of claim 3, wherein the flow attenuation device further includes:

an inclined block disposed on a front side portion of the rear deck block and having a front end inclined upward toward the front inclined plate.

5. The drill ship of claim 1, wherein the flow attenuation device further includes:

a rear guide plate disposed between a water surface inside the moonpool and the rear deck block and protruding from a rear sidewall of the moonpool toward a front side; and

a front guide plate disposed between the water surface inside the moonpool and the rear guide plate and protruding from a rear side wall of the moonpool.