CLAIMS

1. A vortex generator that generates an asymmetric wake for reducing propeller noise and vibration,

the vortex generator comprising a first vortex generating plate formed in a metal plate shape and attached to a right side of a vessel (a left side when a propeller rotates counterclockwise) ahead of the propeller, when the propeller rotates clockwise,

wherein the first vortex generating plate is disposed within a range from a bottom of the vessel to an axis of the propeller,

wherein the first vortex generating plate is formed in a pentagonal shape,

wherein assuming that a distance (AP~FP) between a bow (FP) to a stern (AP) of the vessel is an entire length (LBP) of the vessel, the first vortex generating plate is attached at positions corresponding to 12 ~ 18% of the entire length (LBP) from the stern (AP),

wherein the first vortex generating plate is positioned at an angle such that an angle of attack between the first vortex

generating plate and a flow moving to the first vortex generating plate is 5 ~ 15 degrees,

wherein an angle of attack of a flow moving to blades of the propeller is reduced by generating an asymmetric wake further increasing a speed of a flow moving to blade surfaces of the propeller at a right upper portion of the propeller that corresponds to a portion where cavitation is generated most (at a left upper portion when the propeller rotates counterclockwise), thereby reducing the cavitation at the right upper portion of the propeller (at the left upper portion when the propeller rotates counterclockwise) where the cavitation is generated most to reduce propeller noise and vibration.

2. The vortex generator of claim 1, further comprising a second vortex generating plate formed in a metal plate shape the same as the first vortex generating plate and attached to the left side of the vessel ahead of the propeller (the right side when the propeller rotates counterclockwise), opposite to the first vortex generating plate,

wherein the first vortex generating plate and the second vortex generating plate are attached at the same position at different angles on the left and right sides of the vessel.

35 °

3. The vortex generator of claim 2, further comprising a third vortex generating plate attached to the right side of the vessel (the left side when the propeller rotates counterclockwise) at the same height as the first vortex generating plate, closer to the propeller than the first vortex generator plate.

4. The vortex generator of claim 3, wherein assuming that a distance (AP~FP) between a bow (FP) to a stern (AP) of the vessel is an entire length (LBP) of the vessel, the second vortex generating plate is attached at positions corresponding to 12 ~ 18% of the entire length (LBP) from the stern (AP).

5. The vortex generator of claim 4, wherein the third vortex generating plate is attached at a position corresponding to 8 ~ 15% of the entire length (LBP) from the stern (AP).

6. The vortex generator of claim 5, wherein the second vortex generating plate and the third vortex generating plate are disposed within a range from a bottom of the vessel to an axis of the propeller.

7. The vortex generator of claim 6, wherein the second vortex generating plate and the third vortex generating plate are formed in a pentagonal shape.

8. The vortex generator of claim 7, wherein the second vortex generating plate and the third vortex generating plate are positioned at an angle such that an angle of attack between the vortex generating plates and a flow moving to the vortex generating plate is 5 ~ 15 degrees.

9. The vortex generator of claim 8, wherein a difference of attachment angle between the first and third vortex generating plates disposed on the right side of the vessel when the propeller rotates clockwise (the left side when the propeller rotates counterclockwise) and the second vortex generating plate disposed on the left side of the vessel (the left side when the propeller rotates counterclockwise) is 0 ~ 10 degrees.

10. The vortex generator of claim 9, wherein the difference of attachment angle between the first and third vortex generating plates disposed on the right side of the vessel when the propeller rotates clockwise (the left side when the propeller rotates counterclockwise) and the second vortex generating plate disposed on the left side of the vessel (the

left side when the propeller rotates counterclockwise) is 1 ~ 10 degrees.

11. The vortex generator of claim 10, wherein the difference of attachment angle between the first and third vortex generating plates disposed on the right side of the vessel when the propeller rotates clockwise (the left side when the propeller rotates counterclockwise) and the second vortex generating plate disposed on the left side of the vessel (the left side when the propeller rotates counterclockwise) is 1 ~ 5 degrees.

12. A method of reducing noise and vibration of a propeller by reducing cavitation using the vortex generator that generates an asymmetric wake for reducing noise and vibration of a propeller of any one of claims 1 to 11.

13. A vessel that reduces noise and vibration by reducing cavitation using the vortex generator that generates an asymmetric wake for reducing noise and vibration of a propeller of any one of claims 1 to 11 and is attached to the vessel.