Claim

Ventilation System Design For Livestock Vessel

From "Australian Marines Orders Part 43" for vessel intended to export animals from Australia.

~~a~~1.) Minimum air speed requirement.

The design of the acceleration guide as shown on drawing by us can achieve the minimum air speed of 0.5 m/sec throughout pen areas.

Fresh air pressure from main ventilation trunk will be accelerated due to sudden change in air channel and will travel much further by the air guide (refer to sketch attached).

~~b~~2.) Down flooding at main deck (freeboard deck) level.

We overcome the problem of down flooding criterion (watertight integrity) by using a single ventilation trunk from top of the vessel to the bottom. We design a new system by using trunk over trunk as shown on drawing attached to overcome this problem. This method has been accepted by marine authority and has been used on our vessels "GHENA" converted in year 2010.

3.) A Green Livestock Carrier

Livestock carrier is a floating farm keeping animals with high density in enclosed space. The vessel equipped with self-sustainable systems for sailing from country to country. There are many machinery onboard and require electric power to operate. Besides proper water and food supply. Good ventilation is vital to keep animals in a healthy condition during the long journey.

To provide good ventilation system for few thousands big cattle or more than 30 thousands sheep living in high density condition within the pen areas of

approximate 9,000m2. It needed minimum of 50 number high capacity big axial fans with more than 150,000 m3/hour of volume flow each fan to deliver the required minimum velocity of 0.5m/sec to all pen areas. The ventilation fans are taken out major electric power supply from the vessel.

The power require to drive each fan is approximate 30KW. Total power require will be approximated 1,500 KW. A few high capacity generators has been installed to deliver the required electric power round the clock.

Refer to Figure 1. Our air acceleration guide invention can increase the air velocity at the air outlet to approximate two times of the air velocity in the main ventilation trunk. Therefore, the air velocity in the main ventilation trunk can be reduced, but able to achieve the require air velocity at the air outlet. We adopted above ventilation system developed by us and using a smaller fan with less electric power consumption to save total electric power requirement for fans up to approximate 25% in our latest converted vessel "MV DAREEN" in 2011.

With our invention of ventilation trunk over ventilation trunk at the freeboard deck. We no need to have a separate set of ventilation trunk to serve the upper and lower decks. We reduced the number of ventilation trunks and fans require to serve both upper and lower decks. This invention also complies with the stringent stability criteria for livestock vessel by all marine classification societies.

With our invention of air acceleration guide, a smaller capacity fans has been used for the main ventilation trunk. The slower air velocity in the main ventilation trunk has no impact to the high air velocity requirement at the air outlet to all pen areas.

By our inventions, we had reduced the capacity of the new generators, burn lesser fuel, produced less carbon dioxide and achieved more environmental friendly livestock carrier. This has been proven and working very well with above ventilation system in our latest converted livestock carrier "MV DAREEN" since in operation from October 2011.