Mitsubishi Uses a Sled of Bubbles To Improve Ship Efficiency

Curious Cat Science and Engineering Blog

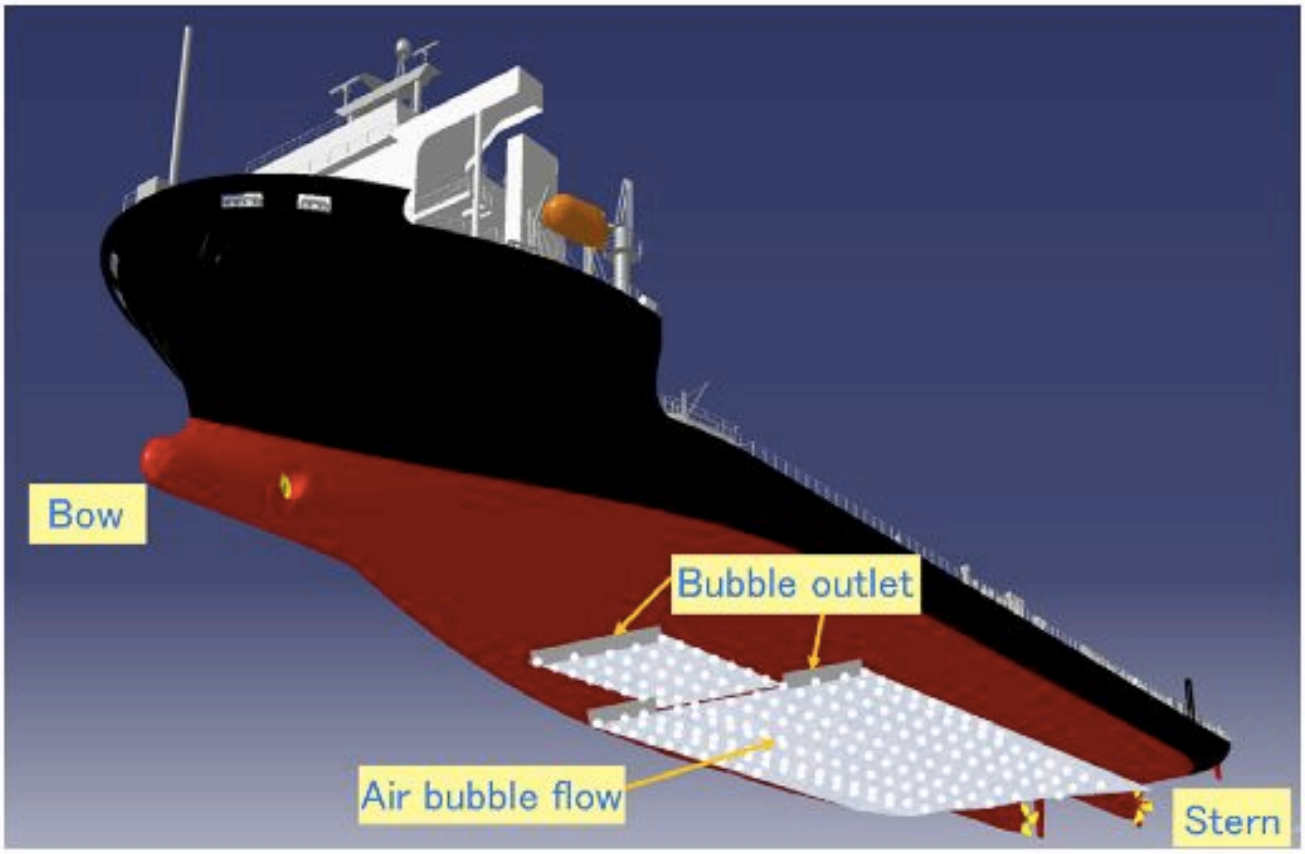

Figure 1 Image of the air lubrication system
The bottom of the ship is covered by air bubbles released from the bubble outlets.

Ship a riding sled of bubbles. Image from: [CFD Predictions of Bubbly Flow around an Energy-saving Ship with Mitsubishi Air Lubrication System] [1]

Mitsubishi completed the conceptual design of a new container ship; this eco-ship achieves a 25% decrease in CO2 emissions over existing ships. Three, of these ships, with the Mitsubishi Air Lubrication System (MALS), are being built now (they should be completed in 2014).

In addition to blowers to create air bubbles under the vessel bottom, the three grain carriers will also feature a newly designed bow shape that will reduce wave-making resistances. For propulsion, the ship adopts a system to effectively convert the main engine power into propulsion power by positioning fins forward of the propellers and placing particular grooves in the propeller boss cap.

Using “eco-ships” to substantially reduce CO2 emissions from maritime transport

[2]
Reducing the frictional drag on the hull of a ship saves fuel and lowers CO_2 emissions. To achieve this, MHI developed the Mitsubishi Air Lubrication System (MALS), which reduces frictional drag by introducing air bubbles by air blower into the water around the bottom of a ship's hull, covering the ship in bubbles. By arranging the air blowhole location and shape and controlling the air volume, the lubrication effect has been enhanced, reducing CO_2 emissions per container transportation by 10 percent.
This system has already been introduced on module carriers, and has been proven to reduce CO_2 emissions significantly.

Related: Sails for Modern Cargo Ships [3] – Eco-Vehicle Student Competition [4]

SOURCE [5]

Source URL (retrieved on *12/21/2013 - 5:58am*):
http://www.ecnmag.com/news/2012/01/mitsubishi-uses-sled-bubbles-improve-ship-efficiency?qt-video_of_the_day=0

Links:
[1] http://www.mhi.co.jp/technology/review/pdf/e481/e481053.pdf
[2] http://www.mhi.co.jp/en/csr/csrreport/specialfeature/earth/index.html
[3] http://engineering.curiouscatblog.net/2008/01/21/sails-for-modern-cargo-ships/
[4] http://engineering.curiouscatblog.net/2007/04/15/eco-vehicle-student-competition/
[5] http://engineering.curiouscatblog.net/2012/01/25/mitsubishi-uses-a-sled-of-bubbles-to-improve-ship-efficiency/