

Circular 40 / 2012**To: Vessel Managers, Masters, Officers, Deputy Registrars, Surveyors and Other Interested Parties****Subject: Entrained Air in Bunkers****Date: 1 June 2012****Summary**

2011 saw a sharp rise in claims of entrained air in bunkers. Entrained air, or the 'cappuccino effect' as it is more commonly known, is an increasingly cited phenomenon by fuel buyers that occurs during bunkering. However, there appears to be a lack of understanding regarding what constitutes entrained air in bunkers. The confusion in the industry today seems to stem from whether the presence of air bubbles seen in fuel upon delivery is normal or excessive.

Entrained air may occur for example due to the practice of tank stripping, which is the process of pumping from the bottom of a bunker tank in order to empty it which can produce entrapped bubbles in fuel. Consequently if tank stripping is not controlled effectively this can make a fuel delivery appear to be of a larger volume (and the derived fuel mass) than it actually is.

Air-blowing (also known as purging) after bunkering is also a standard industry practice to aid in cleaning of the bunker delivery hose before being detached from the receiving ship to help avoid any oil spill. Although this practice is common, there have been cases where this process has been abused. Therefore it is of utmost importance to distinguish between genuine instances of aerated bunkers, and occurrences where there is intent to abuse existing standard industry bunkering procedures.

The potential economic losses when entrained air is deliberately introduced into fuel can be substantial and it is understandable that ship owners might be concerned about cappuccino bunkers especially in today's climate of high fuel costs and depressed earnings capacity by ship operators. However, it is important for fuel buyers to understand that tank stripping and air blowing at the end of the bunker delivery are common industry practices, as far as they are effectively controlled and not done excessively.

Bunker surveyors will measure the quantity of fuel of the nominated bunker tanks of the barge prior to delivery at which point entrained air if encountered and observed would be reported. Together with the closing sounding of the bunker delivery barge an industry acceptable accurate quantity figure can be derived, which would constitute the delivered bunker quantity. Fuel surface air bubbles may be observed by the receiving ship after bunker delivery, however, these should be considered superficial in nature after taking into account tank stripping and hose clearing. Frequent gauging of the receiving tanks during bunkering is one of the methods that can give a clear sign of any air being introduced as accumulated air bubbles can be seen on the gauging tape.

Notwithstanding the presence of an independent surveyor during bunkering the following warning signs would indicate something is amiss with a bunker delivery to the crew onboard the receiving ship.

- Bunker delivery hose jerking.
- Gurgling sound when standing in vicinity of bunker manifold.
- Fluctuation of pressure indication on the manifold pressure gauge.
- Fluctuations of level indication gauge of bunker tanks.
- Excessive bubbles observed on the sounding tape prior and after delivery.
- Slow delivery rates, when air is being introduced during pumping.

If several of the above warning signs are observed, the ship's crew should, preferably with the help of an independent surveyor, launch a thorough investigation to get to the root cause of any potential malpractice of entrained air during bunkering operations.

It is worth reiterating that it is fairly common for the bunker delivery hose to jerk and for superficial air bubbles to be observed following hose clearing and these should not be deemed automatic indicators of foul play. If the opening gauge is performed correctly, the quantity would have been measured prior to the hose clearing and/or tank stripping. Hence, any froth observed after would not have any bearing on the quantity delivered as such.

Working with surveyors to measure bunker quantity is one of the key measures of preventing misunderstanding. It is also important that any concerns are flagged as soon as they are noticed and shortly after delivery. It goes without saying that surveyors are independent parties whose first priority is to ensure the accurate measurement of fuel quantity.

For further information or clarification please contact the Registrar of Ships, a Deputy Registrar or Fleet Manager at Maritime Cook Islands; alternatively you may contact Maritime Cook Islands Head Office at +682 23848 Phone, +682 23846 Fax, info@maritimecookislands.com

Please ensure this has been forwarded to interested parties.