

SAFETY ALERT - TECHNICAL No. 4

STABILITY CALCULATIONS - ESTIMATING CENTRE OF GRAVITY

A recent Incident where a multi purpose cargo vessel developed an angle of loll upon sailing following loading of scrap metal.

This has highlighted the need for extra care when estimating the centre of gravity of cargoes

Masters are reminded of the dangers that inaccurate estimating of cargo centres of gravity can present to the stability of the vessel.

Shippers must advise masters when similar cargoes of differing densities are being loaded so that a proper estimate of weights and positions of centres of gravity can be determined.

Shippers must provide the master with accurate stowage factors of different parcels of cargoes.

Care must be taken to ensure that stowage factors used for cargoes are accurate. Cargoes such as scrap metal should not be assumed to be homogeneous.

The master should ensure that terminals are instructed on the correct order of shipment to ensure that the vessels minimum stability criteria can be exceeded throughout loading and the voyage.

Sufficient time must be allowed for the master to ascertain the vessel's stability and allow for any necessary ballasting operations to be undertaken before proceeding to sea.

Stability calculations and assumptions should err on the side of caution. Incorrect estimates can have serious consequences as the voyage progresses with reducing stability margins.

When ballasting care must be taken not to unduly stress or overload the vessel.

When correcting angles of heel, care is necessary to avoid the danger of inappropriate ballasting, especially when the vessel has an angle of "loll" caused by a negative metacentric height. The effect of free surface and the vertical and transverse movement of centre of gravity must be considered.

Operators of other vessel types such as general cargo and container carriers are reminded of the dangers that inaccurate estimating of cargo centres of gravity can present to the stability of the vessel. It is important that all relevant cargo information as described in; Statutory Instrument 1999 No. 336 The Merchant Shipping (Carriage of Cargoes) Regulations 1999, is passed on to the vessel by shippers.