

**DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD**

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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 4-77

Subj: Shifting Weights or Counter Flooding During Emergency Situations

1. Purpose: This circular gives guidance concerning the danger of shifting weights or counter flooding when a vessel experiences a permanent heel due to a cargo shift.
2. Background. On 2 April 1973, the freighter 55 SILVER DOVE, while en-route from Guam to the Panama Canal with a bulk cargo of raw sugar₁ sank approximately 180 miles southwest of Johnston Island.

The ingress of water through a hull failure caused the vessel to take on a starboard list. This was due to the combined effect of the added weight of the water and the shifting of the sugar cargo, which had become fluid due to the flooding water. To alleviate the increasing starboard heeling moment, the vessel was counter ballasted to port. A sudden shift of the sugar cargo and flooding water to port combined with the ballasting caused a 220 list to port. Additional water entered the hull and the ship eventually sank.

3. Discussion. Most Trim and Stability Booklets provided the master of a vessel certificated under Coast Guard regulations, 46 CFR Parts 1 through 199, do not contain any guidance concerning the danger of shifting weights or counter flooding during emergency situations. The factors leading to the sinking of the SS SILVER DOVE indicate that the stability information provided to the masters of all vessels should include guidance on the dangers of shifting weights or counter ballasting when a vessel experiences a list due to a cargo shift or suspected water in the cargo.
4. Action.
 - a. The stability information for all vessels should contain an appropriate section emphasizing the importance of the Master making every effort to determine the cause of a vessels list before taking corrective action. In instances where the master can definitely ascertain that off center flooding has occurred and that a cargo shift has not occurred, counterflooding or shifting weights to bring the vessel to the upright position may be the correct action. In other instances, such measures may be detrimental to the survival of the vessel.
 - b. In addition, the stability information for all vessels which may carry a bulk cargo should contain the following statement:

"The shifting of a bulk cargo resulting in the vessel taking on a permanent heel may be the result of the cargo becoming fluid due to the presence of water. If this is the case, counterflooding or shifting weights to bring the vessel to the upright position may be dangerous. As the vessel approaches the upright position, the cargo may begin to flow to

the opposite side. This shift, combined with counter measures to reduce the initial heel, will result in a heel to the opposite side approximating twice the initial heel".

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