

# NAUTICAL NOTES

## NOTE No 2

18.04.90

### Shortages in Bulk Grain Cargoes



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If no evidence of an actual loss exists it may be assumed that a shortage at time of outturn in a bulk grain cargo is due to an apparent loss. An apparent loss by definition is non-specific but is the result of one or more factors totalling the difference between the loaded weight and the outturn weight. For definitive purposes the loaded or Bill of Lading weight is the weight determined over the particular weighing system at time of loading. The delivered weight is the weight over the delivered weighing system at time of discharge.

The following areas require investigation when determining a shortage in the delivered bulk cargo weight:-

- Types of weighing system at Load and Discharge Ports
- Leakages
- Weighing errors.
- Windage.
- Squat effect.
- Moisture content
- Sweepings.
- Admixture.
- Road vehicle operations.

We will now take these in turn and discuss them further.

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### 1. TYPES OF WEIGHING SYSTEMS AT LOAD AND DISCHARGE PORTS

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If the Load Port's weighing system was by draft survey then the Discharge Port should use a similar method for determining weight. The various methods generally in use for determining weight vary from draft survey, weighbridges using trucks, silo scales and belt scales.

The method of weighing at the Load Port should always be the same as the method at Discharge Port to ensure minimising of differences in weights caused by dissimilar methods.

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### 2. LEAKAGES

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Grabs should be tight and not spilling when loading or discharging. Similarly a vacuum discharge system must be checked to ensure that there are no leakages and belts should be checked for operational efficiency, ie all fingers in place under hoppers. Any spillage on to quays, off elevators and on to decks should be swept up and delivered to vessel or estimates made of losses to offset against Bill of Lading.

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### **3. WEIGHING ERRORS**

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Differences between weighing accuracy on weighbridges in Load and Discharge Ports can be up to 0.3% of weight on each weighing. Check the scale zero regularly.

Check the last certified check weighing.

Check the seals are intact.

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### **4. WINDAGE**

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Windage is the amount of dust-like particles, chaff, that are blown out of the cargo during loading or discharging. It should be noted that after the cargo has been weighed and then tipped for loading into the ship, windage could account for losses even before it arrives in the ship's hold. Similarly, at time of discharge windage could blow considerable quantities away before the cargo enters the weighing system. A figure we have found acceptable on surveys in strong wind conditions for "light" cargoes is 0.2%.

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### **5. SQUAT EFFECT**

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The effect of squat is to cause the vessel to sink deeper in the water due to the speed of the current passing underneath her, thus giving the impression that she has more cargo on board than she actually has.

This should be taken into account when undertaking draft surveys or by the Master when signing Bills of Lading against shore figures. A more detailed note on draft surveying and squat is contained in our Nautical Note No 3 on Draft Surveying (currently being prepared).

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### **6. MOISTURE CONTENT**

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The moisture content of grain on passage can change. If a reduction in moisture content occurs then that moisture - laden cargo has a change in mass and thus there is a reduction in weight over weighbridge.

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### **7. SWEEPINGS**

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Thorough inspection of the holds, before and after cargo, should be undertaken to ensure that the holds are empty prior to loading, empty after discharge and that all sweepings are swept up and delivered to receivers over the weighbridge or weighing system.

In our experience, 0.25% loss on most trades on the short sea routes around North West Europe is a norm for loss in weight, although on occasions gains have also been noted.

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### **8. ADMIXTURE**

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If bulk grain cargoes have been loaded in such way that two or three grades are loaded in one hold using tarpaulins or separation cloths, then any failure in those separation cloths may show a good outturn in one grade and a shortage in another grade due to admixture of quantities.

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### **9. ROAD VEHICLE OPERATIONS**

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A final problem involves bulk grain cargoes, particularly when involving road vehicles and weighbridges. It is normal practice to employ cargo superintendents to supervise such activity on behalf of Receivers and Shippers at both Load and Discharge Ports. It must be remembered by all parties, however, that one man cannot be in more than one place at one time.

It is incumbent upon the vessel, if she feels at risk, to take such steps as will best protect her interests. In our experience the best possible method of ensuring the interests of the vessel is to record every truck loading at the ship's side and should there be any claim for shortages, to merely then check that every truck that loading in sequence with the time actually logged in and out over the weighbridge.

It is not unusual for the odd vehicle to make a trip to a store without passing across the weighbridge, thus losing the vessel's cargo at 20 tonnes per trip.

It is not possible for the ship to monitor whether the drivers are getting out of their cabs on each and every occasion at the weighbridge and this in itself can bring considerable differences into a weighing system. For instance, assuming a driver to be some 14 stone (probably conservative) then when he weighs his vehicle empty without him in the cab, he gets a tare weight correct.

He then loads some 20 tonnes of grain, proceeds to the weighbridge and if he remains in the cab, he adds 14 stone to the total load as only the original tare weight will be deducted as it is a manual input. On a particular day it is not unknown for one truck to make twenty round trips, which on a 14 stone man equates to some 4,480 pounds, multiply that by ten trucks and we already have 44,000 pounds, some 20 tonnes missing, all occasioned by the man or drivers sitting in their cabs at the wrong time.

It is also possible, whilst on this subject, to have long distances between ship side loading and the weighbridge facility. It has come across our desks on occasion that it is possible for the operators of the vehicles to undertake the trip such that instead of having arrived with a full load, "grossed in" and "tared out", such that the weighing is all done very quickly, they have "tared out" at the weighbridge, driven 20 or 30 miles to the ship, loaded up, driven the 20 or 30 miles back to the weighbridge and then "grossed in" and tipped, nothing particularly wrong with that until one realises that on a 60 mile round trip the vehicle is consuming fuel and as such at a conservative 10 miles to the gallon some 6 gallons on 10 trips per day, that's 60 gallons, with 10 trucks it's 600 gallons and again we are approaching losses of measurable proportions. It is therefore incumbent on all parties to understand the various risks and areas for losses to occur which could be blamed on the ship.