DRAFT SURVEY & TRIMMING

A Science…. The Application Of Which … Is An Art

Determination of Cargo Loaded or Discharged

Draft surveys are a very common type of survey, they are carried out on many bulk shipments. The draft survey may be requested by shipper, receiver, charterer, ship-owner, P&I club, superintending company, or other interested party. Christy & Griffin have been engaged in draft survey work since foundation in 1966.

The reasons for making draft surveys are normally to determine cargo loaded or discharged, often for producing commercial documents, but equally important, at out-turn, to confirm the cargo discharged is consistent with the cargo loaded.

A draft survey made on a vessel is considered to be a more accurate method of determining cargo than any other means, although some highly sophisticated weighing systems claim to be accurate. However it should always be noted that any mechanical system is prone to failure, or more dangerously, subject to cumulative errors that are not readily apparent; whereas a draft survey carried out on a vessel is static…..there are no moving parts!

Twin draft damper, for use in sea or swell.

Captain P. Bennett using custom designed draft density bucket, that prevents 'layering' error in seawater density

Portable draft gauge tubes, to monitor list.

It should not be thought that a draft survey is 'easy'; a full and complete understanding of the many complexities that make up a draft survey are not to be taken lightly. It is not a matter of plugging figures into a laptop and coming out with answer. Out of all marine survey work, draft surveys are probably the most poorly executed, as there are too many potential short cuts, and only any experienced surveyor can undertake this service in an accurate manner.

Christy & Griffin surveyors, through their on-line knowledge database, have contributed a number of technical papers on some of the intricacies of draft surveying.

C&G have also developed a number of methods to increase the accuracy of draft surveys. These include twin draft damping tubes, that can eliminate effect of sea and swell, portable draft gauge tubes, that once calibrated can quickly and safely determine the list of the vessel in centimetres. C&G are currently developing a reflective laser sighting device to determine the vessel's freeboard.

Trimming

It is now common practice in some Australian bulk loading ports, for terminal operators to require vessels to employ the surveyor to undertake the trimming at the end of loading.

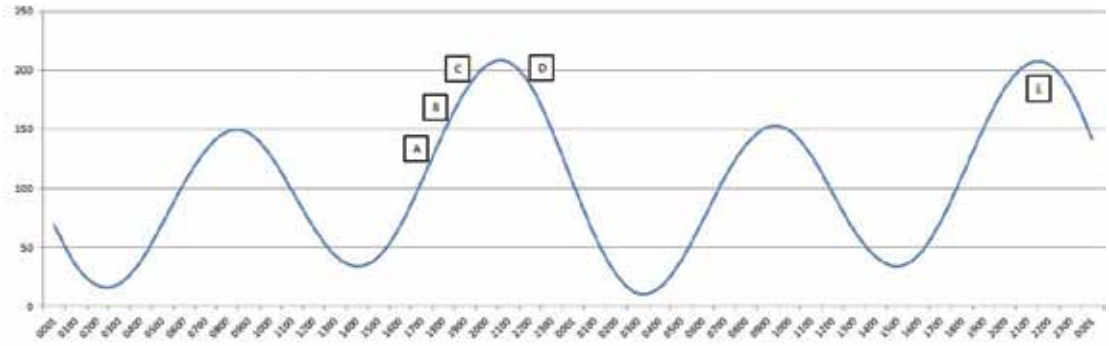
There are sound practical and commercial reasons for this, the surveyor is more accustomed to making the surveys, than ship's crew, and it is nearly always a time saving operation. The saving of thirty to sixty minutes may seem trivial, but the 'knock on' and cumulative effect can be substantial, when considering the power required to run machinery in idle mode, the effect of delaying vessel sailing (or missing a tide !), and when there are other vessels waiting. Over a period of time the cost saving considerable, everyone wins when the surveyor is present.

By employing the surveyor, the possibility of vessels overloading is drastically reduced. This may sound very straightforward, but in river ports especially, a sudden and dramatic change of water density that can accompany ebb and flow, can cause a vessel to become overloaded very quickly, especially where there is a fast loading rate. The Port of Newcastle NSW, coal terminals have made it compulsory to employ trimming surveyors; and the efficiencies gained have been quite astounding. This is a practice that will become more widespread.

Then there are the advantages gained by the owner or charterer by utilising a surveyor. The local expert's knowledge of the workings of the port and terminal are experience matters and a valuable asset to the owner or charterer. Primarily maximizing cargo lift to increase freight is the desired result, and this is day to day work for a surveyor. There are however other aspects, for example, contract tonnages being maximized without exceeding contract. But by simply being there, working with the ship, the charterers, the shippers, and the terminal to overcome the inevitable unforeseen problems, the surveyor adds value.

The Question of Tide

This is a real life example of how things can go wrong:-



Lessons Learnt

- This was a costly exercise for all concerned.
- There could be no real 'blame' attached to this situation, as there was a systematic failure to recognize potential problems and consequences until it was too late.
- The actions of the vessel extinguished all options to resolve the issues.

HOW THIS WOULD HAVE BEEN DEALT WITH HAD THE INTERESTED PARTIES ENGAGED A PROFESSIONAL SURVEYOR.

- The surveyor would have vetted the ship's load plan, and not allowed trimming in extreme hatches (1 & 7) so that significant changes of trim would not occur during the final pours.
- The surveyor would have scrutinized the climatic conditions, and been aware of a potential tidal cut.
- Once the issue of the shore breakdown as known, the surveyor would not have allowed any further loading, until the options of reducing trim (& maximum draft) had been explored. Transfer fuel, dump fresh water & ballast into forepeak.
- In all likelihood, had the vessel not used hatch 7 for a trimming pour, the vessel could have made the tide as planned, by introducing a little ballast into the forepeak. This would require making an immediate decision at 1900 to cut out the cargo for the 2nd trimming pour. This decision would have to have been made by the Master, however this would have meant an immediate decision, and in many cases, ship's masters are reluctant to do so.

The below event is only one example of things that can go wrong, and quickly cascade into quite a serious situation.

1820 Vessel made trim calculation to sail even keel for a 2.23m tide (13.86m) , for sailing time 2000
(1 hour prior to high water)

1900 First trimming pour was completed, however an equipment failure prevented 2nd trim pour starting. Vessel had a 68cm trim, with after draft 14.12cm

1945 pilot arrived on board, found maximum draft was 14.12, and refused to sail vessel.

The vessel completed loading at 2130, after high water. The next sailing slot was the (high) high tide the following day.

The following day however, saw an intense high pressure system, which 'cut' the tide by 20cm.
And at this time, the vessel, having completed loading, was on even keel of 13.86, and could not sail, as the maximum sailing draft was now 13.66

The height of high water over the next seven days, was now falling – the vessel was 'neaped'

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