

THE FACTORS ENABLING SELF UNLOADERS TO COMPETE EFFECTIVELY WITH CONVENTIONAL BULKERS

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Abstract:

The self-unloading ships offer a discharging rotation which is faster than conventional bulk carriers and will reduce turnaround time, free up congested berths and reduce port costs and demurrage. As they require no shore-based unloading systems, self-unloaders can operate and discharge cargo in any accessible waterway, thereby reducing the need for large capital investments on the shore side. Vessels operating on bulk trades generally do not operate on scheduled services, but on specific voyages in fulfillment of short or long term contracts, where the entire cargo shipped on a particular voyage belongs to one owner. Additionally, carriers may ply variable routes according to local demand in particular ports, and can transport a variety of bulk cargoes. These are customarily identified as a separate sector of the industry, known as tramp shipping. This paper discusses how these highly specialized ships (Self Unloaders) ensure a safe, fast, reliable, cost-efficient and environmentally responsible method of delivering cargo than Conventional bulkers.

Key words: - Silo, Bulk carrier, Self unloader, Demurrage, Hybrid Vessels, Archipelago

Introduction:

Continuously self-unloading vessels can offer significantly lower transport costs than conventional geared and gearless bulk carriers. These depend on achieving the right combination of shipping and port economies, in order to offset higher capital costs. Recent developments have focused on the use of "hybrid" vessels to achieve some of the benefits of self-unloaders for a lower investment cost. Such developments have widened the scope of the market, especially for short-term contracts. Self-unloaders have found increasing employment on the American east coast, in northern Europe and east Asia. There are growing opportunities for self-unloaders in the developing world, where expansion in throughput co-exists with sparse port and terminal investment.^[1]

As well as exploring recent market trends and prospects for self-unloading and hybrid bulk carriers, this study examines the economics of self-unloading, hybrid, geared/ gearless vessels to support Ship owners, Charterers in choosing the right vessel depending upon the trade pattern which yields them the overall profit taking into account Environmental and Socio Economic factors.

Investment on Bulk Carrier Trade discharging system:

Needless to say that the purchase of a land discharging system (like Kovako or Siwertell) represents a substantial investment. It is therefore very much important to be sure of the volume the port terminal intends to import and commercialize through the land silo mechanism. Then one can easily make an error in choosing the capacity of the land discharging system. If the imports are much

higher than the ones the port terminals initially forecasted, then the ship owner understands that he made an error and feels he should have bought a more efficient discharging machine to save lot of time and he is forced to invest in a second and bigger machine, which will then increase the initial budget. On the contrary, if at the end we import much less tonnage than the one forecasted, and then investing in a machine

without using its full capacity, it is waste of money. On the other hand, with a self discharging vessel, the solution is very simple as the ship owner would freight a vessel according to the import needs and should the owner make an error on import volumes, he would always solve the minor problem freighting a bigger or smaller vessel.

Table: 1 Relative voyage costs per ton between Self unloader and Conventional Bulker [2]

Dollars /dWt	Haul Length (Nautical Miles)				
	100	200	300	400	500
15,000 dWt					
Gearless	7.46	7.79	8.13	8.46	8.80
Geared (Pedestal)	6.25	6.63	7.02	7.40	7.79
Scraper-type Top reclaimer	4.03	4.42	4.82	5.21	5.60
Gravity-based Self Unloader	3.98	4.43	4.88	5.33	5.77
30,000 dWt					
Gearless	6.76	6.95	7.13	7.32	7.51
Geared (Pedestal)	5.13	5.35	5.56	5.77	5.98
Geared (Gantry)	4.53	4.75	4.96	5.18	5.40
Hybrid (Gantry/belt)	3.61	3.84	4.06	4.29	4.52
Gravity-based Self Unloader	3.36	3.61	3.86	4.11	4.36

Source: Skaarup Group Estimates (2010) Reference

If one considers the investment aspect, it has to be examined with reference to the logistics- simply a question of deciding which is the most suitable discharging mechanism.

The chartering of a self discharging vessel (pneumatic) has no requested investment from the Charterers side, as the ship owner bears this investment. Now in the longer run, if one invests in a shore machine, it will be repaid after some years and it will have a residual value, but the same will not happen with a chartered vessel.

Factors considered in decision making:

Generally, ship operators take into account the following factors, while making a decision

- Flexibility
- Possible damages for having wet coal in holds
- Stevedores and discharging mechanism aspects
- Breakdown of the discharging systems
- Dust free environment

- Rain hazard
- Supply to various terminals which is a logistics issue

Flexibility:

It is very difficult to freight a pneumatic vessel on on-spot-basis, as usually you have to charter it on semester basis or even on yearly basis. On the other hand, it is much easier to find conventional vessels of any size in the market and take her, on on-the-spot basis or if requested on consecutive voyages. The good thing about freighting a bulk vessel on spot basis is that sometimes you will freight the vessel on "return basis" which will enable you to lower the freight. ^[3]

As mentioned before, there are not many self discharging vessels in the market whereas on the other hand, you will find a great deal of conventional Bulk carriers.

It is rare to find self discharging vessels of more than 25000 mt, whereas you can find plenty of bulk carriers of this tonnage.

Possible Damages for having wet coal in Holds:

Bulk carriers trading coal are usually over aged vessels, which sometimes have problems with the water tightness of their hatches. When there is bad sea weather, these vessels usually have water filtrations in their holds which always cause discharging problems; if on the other side, by discharging the coal with a sucking or screw system, problems like - breakdown of crew conveyor belt or clogging of sucking machines – could hamper the operations. According to shipping law, it is Charterer's obligation to discharge wet cargo from holds. However, these problems never appear on a pneumatic vessel as they do not have hatches.

Stevedores and Discharging Mechanism:

In some countries like Spain or Italy, port laws are very strict in this matter, as it is most of the time forced to use the services of stevedores or at least pay for their presence at the port, even though they have been paid for nothing. On the other hand, in some countries, the cleaning of the holds have to be done by local stevedores, which unfortunately, apart from extra cost which this represents, it also causes big problems, if the vessel has to be cleaned during weekends or holidays.

With the pneumatic vessel, there will not be any problem with the holds cleaning as there are no holds.

Breakdown of the discharging systems:

Depending on the cargo type, the discharging system can breakdown. For example, coal is an abrasive material and therefore maintenance is very much needed. In case, if the land discharging mechanisms breakdown, the vessel will have to wait and charge you for possible demurrages which will mean an extra cost. On the other hand, if the vessels discharging mechanisms breakdown, no demurrages will be charged. In underdeveloped countries, it could be difficult to find qualified staff to operate and maintain shore equipment.

Dust Free Environment:

In some regions of Europe, it is totally prohibited to load or discharge coal with open hatches because of environmental problems (dust, pollution, etc.). If shore mechanisms are used, they have to be fitted with special systems.

Rain Hazard:

In all rainy countries, while discharging the cargo from conventional bulk vessels, discharge has to be interrupted when it starts raining, and this of course may cause an extra cost of personal and demurrages and in worst case the coal can get wet during hatch closing. When cargo is discharged with a pneumatic vessel, the cargo operation can be done day or night, snowing or raining.

Supply to Various Terminals:

When it comes to supplying to various terminals, which are not well road connected or which are located in several ports of an archipelago, it is better to use a self unloader instead of moving the land discharging mean from one port to the other or to purchase as many discharging mechanisms systems as land silos. Chartering a self discharging vessel, this problem can be easily solved.

Advantages of Self Unloaders

To sum up the Self Unloaders (hybrid ships) have the following advantages:

- Environmental Advantage
- Discharge advantage
- Ease of operations
- Efficiency
- Simplicity of Operation and Control

Environmental Advantage – The new generation self-unloader is equipped with advanced dust suppression systems. Dust suppression units are situated throughout the cargo handling areas, and the discharge booms are enclosed and fitted with water sprayers to further reduce dust during off loading. Compared to conventional vessels the self-unloader is quieter. The new generation self-unloader is proven in service, on the East Coast of the United States. These vessels are the only ones approved by the EPA for 24 hour discharge.

Discharge advantage – Due to the moving-hole-feeder (MHF) discharge system, unloading is faster and smoother than conventional dry-bulk carriers or even competitors' self-unloaders. This reduces turnaround time, thus reducing port costs and demurrage while providing more cargo in a shorter time.

Ease of operations – Due to the MHF, telescopic boom and simple computer assisted discharge control systems, the new generation self-unloader can discharge to a large variety of receiving systems such as high or low capacity belt systems, spill heaps, trucks, barges as well as transshipments ^[4].

Efficiency - Self-unloaders can operate 24 hours, day and night without the need of stevedores or trimming crews, this speeds up cargo handling, reducing port costs and demurrage. The new generation self-unloader has high ballast water transfer capabilities and hence loading times are also reduced. This type of vessel is capable of loading cargo at rates of up to 20,000 metric tons per hour safely.

Simplicity of Operation and Control – Due to the efficient use of well proven modern technology the full discharge of the vessel can be controlled safely and efficiently by only one vessel cargo technician operating from the vessel's Central Control Station.

Conclusion

Thus the fully enclosed conveyor belt self unloading system combines fast ,economical and highly flexible port performance with a range of cargo handling benefits over conventional bulkers.

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