OCEAN SHIPPING CONSULTANTS Limited

PRESS RELEASE

HYBRID CHALLENGE TO SELF-UNLOADERS

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 – combining cranes with conveyors and a boom – 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.

A growing world fleet has boosted the opportunities for developing spot trades to add to the traditional long-term contracts for set tonnages of particular cargoes. It has also created a second-hand market.

Self-unloaders have found increasing employment on the American east coast, in Northern Europe and East Asia. There are growing opportunities for their utilisation in the developing world, where expansion in throughput co-exists with sparse port and terminal investment.

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 and gearless vessels in detail. Voyage and terminal costs are explored for different types and sizes of vessel, and notional case studies are used to illustrate the economics of different trades.

The following highlights some of the main findings of the report:

The Fleet

- Globally, the number of ocean-going self-unloading bulk carriers climbed from 60 in 1990 to 110 in 2002. 23 vessels have been added to the fleet since 1995. Total capacity increased from 1.68m dwt to 3.82m dwt over 1990-2002. There has been a steep rise of 29 per cent from 2.96m dwt in 1999. Average vessel capacity rose to 34,706dwt in 2002.
- In addition to the development of the 80,000dwt+ sector, from three to nine vessels since 1990, there has been major growth in the 50,000-80,000dwt category, from seven to sixteen vessels over the same period. The average deadweight of new conversions added to the fleet since 1995 is 36,797dwt. That of newbuildings introduced over the same period is 51,658dwt.
- Nevertheless, the 0-12,000dwt sector contains the largest number of vessels, accounting for 32.7 per cent of ocean-going self-unloading bulk carriers in 2002.
- The largest numbers of vessels are deployed on the east coast of the Americas, in the Europe/Mediterranean region and in East Asia, giving these regions shares of 27.3 per cent, 25.4 per cent and 28.2 per cent respectively of the world fleet in 2002. The balance of the

fleet is deployed in Australian waters, on transatlantic hauls, in Africa, across the Pacific, in the Middle East and off the Indian subcontinent.

- In terms of deadweight tonnage, the American fleet is by far the largest, accounting for 47.2 per cent of world capacity, with the east coast fleet accounting for 42.9 per cent in 2002. East Asia's share doubled from 9.1 per cent in 1991 to 20.6 per cent in 2002. The share of world deadweight capacity deployed in the Europe/Mediterranean region amounted to 14 per cent in 2002 and Australasia's share was 5.0 per cent. The "Others" category, which contains a large transpacific carrier and relatively large vessels deployed in the Middle East and Indian subcontinent, accounted for 10.2 per cent of global deadweight in 2002, compared with 4.5 per cent of vessel numbers.
- There are two main types of self-unloading systems – gravity-based and top-reclaiming. Both employ conveyor belts to transfer the cargo, normally via a boom, to receiving equipment ashore or into another vessel or floating terminal. Three types of belt system are commonly in use in gravity systems: loop belts (compressing cargo between two belts), pocket belts and inclined belts. Top reclaiming types divide broadly in scraper or scooper systems and/or bucket conveyor systems. In addition, pneumatic and suction-pump systems are used almost exclusively in cement self-unloaders.
- Most recently, the effort to broaden the market for self-unloaders has focused on reducing capital costs through the development of so-called "hybrid" vessels, equipped with a combination of belts, boom and grab cranes. Although these do not unload as rapidly as

Table
Self-Unloading Bulk Carrier Fleet by Deadweight Capacity, 1980-2002

	1980		1985		1991		1997		2002	
	Units	'000dwt	Units	'000dwt	Units	'000dwt	Units	'000dwt	Units	'000dwt
0-12,000dwt	7	72.1	20	188.5	27	200.5	37	262.9	36	263.2
12,001-25,000dwt	11	213.4	7	130.7	12	222.0	16	301.0	19	346.6
25,001-50,000dwt	8	242.7	16	543.0	18	608.5	23	803.6	30	1,094.2
50,001-80,000dwt	7	428.7	7	453.5	7	469.1	10	679.0	16	1,072.8
80,000dwt+	1	159.2	1	159.2	3	444.1	6	725.8	9	1,040.8
Total	**34**	**1,116.2**	**51**	**1,474.9**	**67**	**1,944.2**	**92**	**2,772.4**	**110**	**3,817.7**
Average Deadweight		***32.8***		***28.9***		***29.0***		***30.1***		***34.7***
Per Cent Share										
0-12,000dwt	20.6	6.5	39.2	12.8	40.3	10.3	40.2	9.5	32.7	6.9
12,001-25,000dwt	32.4	19.1	13.7	8.9	17.9	11.4	17.4	10.9	17.3	9.1
25,001-50,000dwt	23.5	21.7	31.4	36.8	26.9	31.3	25.0	29.0	27.3	28.7
50,001-80,000dwt	20.6	38.4	13.7	30.7	10.4	24.1	10.9	24.5	14.5	28.1
80,000dwt+	2.9	14.3	2.0	10.8	4.5	22.8	6.5	26.2	8.2	27.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

January 1 oceangoing fleet; excluding cement carriers
Figures may not sum exactly due to rounding.

Source: Ocean Shipping Consultants Ltd

pure self-unloaders, they offer the flexibility to handle a variety of cargo types, to self-unload to shore, ship or barge, and also the capability to self-load. However, typically, the unloading gear is not enclosed, which means such vessels may be restricted to applications where a lower level of environmental protection is acceptable.

- Loop-belt and top-loading scooper/scraper systems are the most commonly found type of self-unloading gear, followed by incline-belt and hybrid crane/grab-and-conveyor systems. Most of the balance of the fleet is made up of bucket elevator (gravity-based) and pocket-belt self-unloaders.

- Coal, limestone and gypsum are the types of cargo most frequently carried by self-unloading bulk carriers – both on dedicated trades and on charter. These are followed by fertiliser, iron ore, aggregates and grain. Other cargoes include stones, salt, refined sugar, other ores (alumina, bauxite and lead/zinc concentrates) and clay. Of the 110 vessels in the 2002 fleet, 27 were trading in a variety of different cargoes.

- After a series of newbuildings and conversions at the turn of the millennium, prospective newbuilding activity is set to continue in 2002, with two newbuildings and four hybrid vessel conversions anticipated.

- The world fleet of self-unloading cement carriers comprised 106 vessels totalling 1.11m dwt in 2001. Although the number of self-unloading cement carriers is similar to that of self-unloading bulk carriers, vessel size is on average considerably smaller at an average of 10,462dwt. 62.3 per cent of self-unloading cement carriers were built in the 1970s and 1980s, whilst pre-1970 tonnage accounts for 22.6 per cent. Only 15.1 per cent have been constructed since 1990 (although there have been further conversions of older tonnage).

Vessel Costs

- The study compares the built-up vessel costs (capital, operating, bunker and time costs) of self-unloaders and hybrids with those of conventional geared and ungeared bulk carriers across various haul lengths.

- Based on the comparative built-up costs and assumptions outlined in the study, the most cost-effective choice of vessel, on short hauls up to 500nm, is a 30,000dwt gravity-based self-unloader which achieves vessel costs of $3.36-4.36/t depending on haul length, compared with $3.98-5.77/t for a 15,000dwt self-unloader of the same type or $4.03-5.60/t for a top-reclaiming type. 30,000dwt hybrids compare fairly well with gravity self-unloaders, with a range of $3.61-4.52/t over haul lengths of 100-500nm. There are cost ranges of $5.13-5.98/t and $4.53-5.40/t for conventional 30,000dwt pedestal-crane and gantry-crane equipped vessels respectively.

- For medium hauls (up to 3,000nm) also, self-unloaders – whether top-reclaiming or gravity-based – and hybrids outperform geared and gearless vessels of the same capacity. Competitiveness again improves with vessel size. Thus, for a 1,000nm voyage at the lower end of the medium-haul spectrum, the $8.01/t cost for a 15,000dwt, gravity-based self-unloader compares with $5.62/t for a 30,000dwt carrier of the same type and $4.41/t for an equivalent 70,000dwt carrier. Hybrids have a similar profile at $5.67/t for a 30,000dwt vessel and $4.48/t for a 70,000dwt vessel. At 2,000nm, hybrids are outperforming self-unloaders of the same capacity.

- On long hauls upwards of 4,000nm, the capital and operating costs of self-unloaders begin to outweigh the benefits of their speedier discharge times. The most competitive choice of vessel is a 70,000dwt hybrid carrier, discharging by means of gantry cranes and belts, which yields costs of $8.71-$13.34/t as length of haul increases; it is followed in competitiveness by a 70,000dwt geared vessel, equipped with just gantry cranes. These vessels' cost advantage over a self-unloader of equal capacity increases with haul length. For all vessel types, per tonne costs decrease as vessel size increases.

FIGURE 1
15,000DWT VESSELS: VOYAGE COSTS PER TONNE 2002

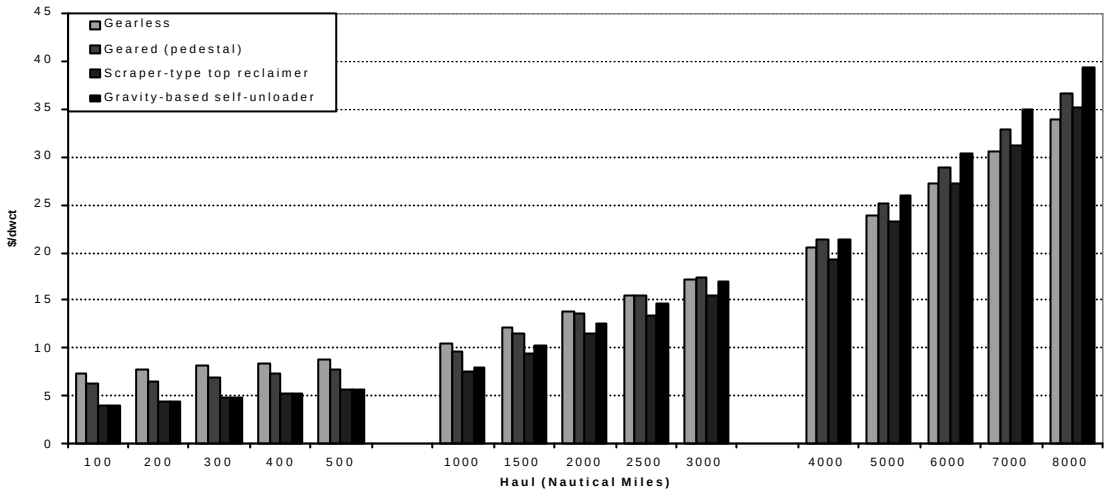


FIGURE 2
30,000DWT VESSELS: VOYAGE COSTS PER TONNE 2002

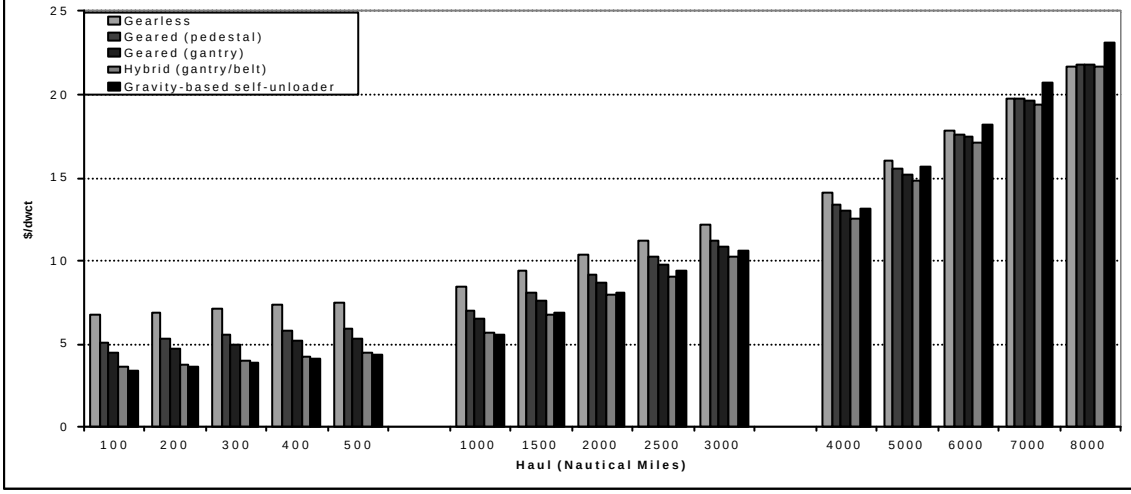
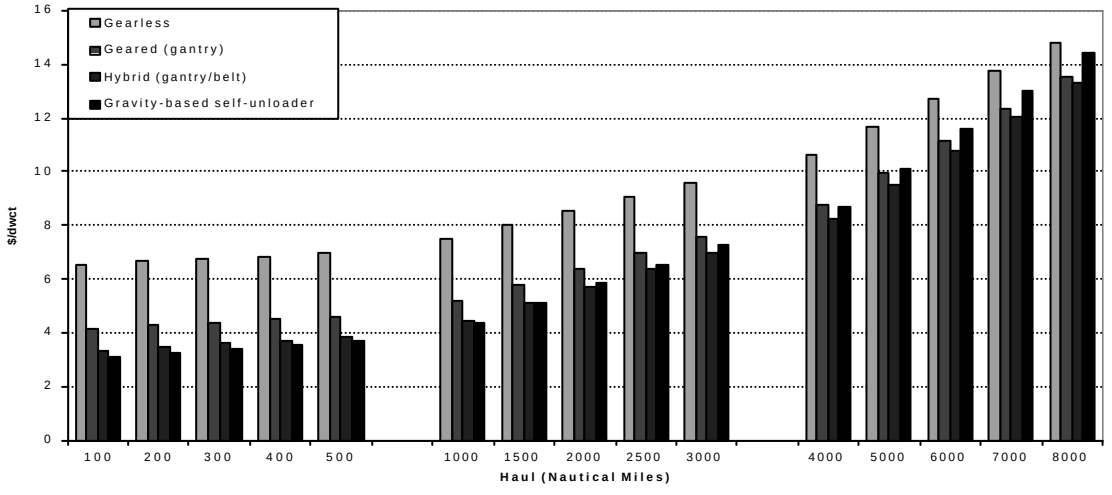


FIGURE 3
70,000DWT VESSELS: VOYAGE COSTS PER TONNE 2002



* *SELF-UNLOADING, HYBRID AND GEARED BULK CARRIERS*

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