



Technical Article

## **Self-Unloaders - Evaluating the Economic Advantages**

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Too often the economic evaluation of self-unloading ships is done by comparing their rates with those of conventional ships. The objective of this article is to show that the economic evaluation of a self-unloader relative to conventional ships requires that all relevant costs be considered, not just the shipping costs.

Self-unloaders are becoming more popular as more are built for North American markets. They are also beginning to make an appearance in Europe and Asia. And, they are becoming a more common subject of trade journals; witness the reference to them in five articles in the North American Special Part 1, of bulk solids handling. I would like to directly address the economic evaluation of self-unloaders versus conventional ships using a specific North American example.

A cut-away view of a self-unloader is illustrated in Fig. 1 showing the main elements. The tank-tops are not flat but are angled to form hoppers which enclose gates at the bottom. When these gates are opened, which is done in a controlled sequence, the cargo drops onto the conveyor belt beneath and is carried aft. Then an elevating device, usually a loop-belt, lifts the cargo from below the holds to above the deck level and onto a boom conveyor. The boom conveyor, which can be of varying lengths, allows the cargo to be deposited well away from the side of the ship. This type of ship-unloading system permits rates

of cargo discharge of between 1,000-10,000 t/h, but the most common unloading rates range from 2,000-5,000 t/h.

In essence, the self-unloader provides a mode of bulk handling that goes beyond simple marine transport, therefore the economic evaluation must go beyond the simple comparison of one shipping rate with another. Fig. 2 shows the CANADIAN PIONEER, the latest addition to the Upper Lakes Shipping fleet.