

Van Aalst Bulk Handling

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IMPROVING SHIPUNLOADING EFFICIENCY

+ case study

A 200 tph cleanup system for Mitsubishi Cement in Long Beach.

Van Aalst Bulk Handling B.V. does get more and more requests from customers to analyze their terminal and to see if their terminal operations can be more efficient.

The reason for such a request can be:

- Older type of unloader – replacement or overhaul
- High transport costs for cement
- Higher turnover per year

Older type of unloader

Terminal owners with equipment which is 10 years or older come to our company to know if their equipment will last for another 10 years and what must be done to keep the unit reliable.

To these terminals we send our engineers which check the status of vacuum pumps, compressors, suction arm, drive motors, etc.



The engineers check also if the newly developed features like hurricane aeration system, radio remote control, pinch valves and rotating fluidizing nozzle can be installed on the unit.



The hurricane aeration system and the rotating fluidizing nozzle improve the unloading capacity.

The radio remote control and the pinch valves ensure less maintenance costs, less downtime during unloading and a longer lifetime of the arm.

The electrical drive motors will be checked (meggered) but more important the instrumentation and PLC as well.

The developments in the electronic industry is quick, and although PLC suppliers keep a stock of "old" items for several years when a new type is developed, the stock is limited. This is also valid for instrumentation like pressure transmitters, level transmitters, dust detectors etc. At a certain moment, no spares can be obtained anymore.

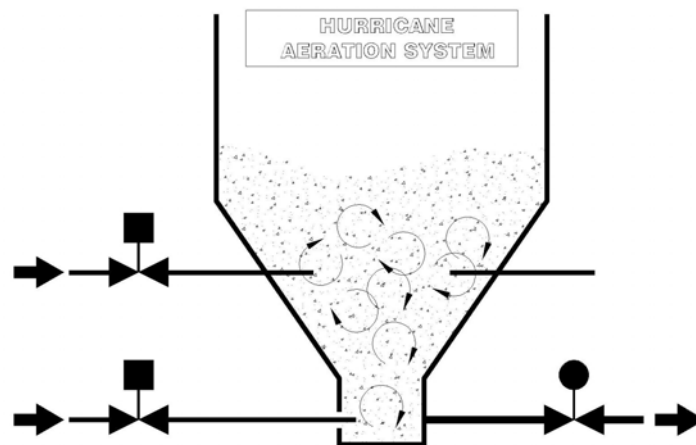
And remember:

A ship unloader breaks down when it is in operation and the ship is along side.

So make sure that your equipment has spares in the market, or on the shelf in your warehouse.

We have done various upgrades in the USA and Europe and can conclude that:

- Most shipunloaders are still o.k. but must be equipped with:
 - Hurricane aeration system
 - Pinch valves
 - Radio remote control
 - Rotating fluidizing nozzle
 - New PLC
 - New instrumentation
 - Many times also a new suction arm was needed.



- Extra on the shelf:
 - A spare vacuum pump
 - A spare compressor

High transport costs and high shipping rates

This looks the same, but I mention the shipping rate separately while this is important for the time needed to unload the ship in the harbor.

The higher transport costs make that import terminals start to look at the ship size. The bigger the ship, the lower the price for transport.

Some of the terminals owners come to us and ask us if we can put a longer unloading arm to the unloader. Sometimes this is possible, but the unloader capacity will become lower while for bigger ships – everybody prefers bigger capacity.

To keep the same capacity with a longer arm, more suction air (vacuum pump(s)) must be installed. But the bigger amount of suction air requires more filters in the filter kettle. More filters requires a bigger filter kettle, etc. etc.



In short:

To modify a shipunloader which is built to unload small ships into one which can unload big ships is not economical and will never become an efficient tool.

Higher Turnover Per Year

This situation is the most common one. More and more cement is required and must be unloaded with the same shipunloader. In some cases this results in ships which must wait outside the harbor while unloading still goes on at the berth.

The terminal managers at that moment want a higher capacity of their unloader. The ships must be emptied and quick!

This was the situation at the Long Beach terminal of Mitsubishi Cement Corp. in California. They had an unloader in operation which was designed for an unloading capacity of 800 tons/hour. This unit works well. It is a rail mounted unit which conveys the unloaded cement to a flat storage warehouse.

But during clean up of the holds, the capacity of the unloader is much lower. One can compare this with a coffee cup full of sugar. With a soup spoon the main part of the sugar can be taken out easily but to take the last part will take relatively a lot of time. The last spoon to empty the cup contains hardly any sugar anymore.

During the discussions with the people of Mitsubishi a two stage plan is decided for:

- 1) Upgrade of the existing ship unloader
- 2) Delivery of a 'clean up' unit.

The existing unit has been equipped with hurricane aeration systems at the bottom of the transfer vessels and pinch valves. Also the PLC has been renewed.



The main item was the delivery of the cleanup unit. The idea was that the big unloader unloads the main part of the cargo hold and the clean up to be done by the smaller cleanup unit. One problem came up: the limited space on the berth. The cleanup unit has to pass by the big unloader when moving from one hold to another. The space left over for the cleanup unit was maximum 6 meters wide.

Van Aalst Bulk Handling B.V. has created an unloader with a width of 5.9 meter which can unload ships of 40.000 dwt.

The unit is equipped with self-propelled wheel sets to be able to move around the big unloader. Stability was a problem – the long unloading arm to unload ships of 40.000 dwt and the small platform with a width of less than 6 meter,

The long arm has to be highly flexible to reach in all corners etc. and still could not be made too heavy due to stability factors.

To keep the weight down also the suction line along the arm has to be taken into consideration.

In consultation with Mitsubishi Cement Corp. an optimum unloader has been designed for the existing terminal. The unloading capacity was designed for 180 tons/hour. When the ship arrives, both units start to unload full holds. When the big unloader reaches the end, it moves to the next hold and the cleanup unit finalizes the work in the hold.

The advantages:

- Less power consumption
- Quick unloading of ship
- Back up unit
- Flexible operation

Disadvantages:

- Two operator crews

At relatively low investment costs the turnover of the terminal could be:

- increased with 50%,
- 25% more unloading capacity - 50% more turnover.

