

Grain port technology stationary solutions

Tomas Kisslinger, Managing Director, NEUERO Industrietechnik, GmbH, Melle, Germany

Introduction

This article examines the importance of custom stationary design for logistic solutions in bulk grain handling. The pneumatic system facilitates complete unloading because of its optimum clean-up characteristics (using a vacuum cleaner like principle). It has lower foundation loads compared with a mechanical system, and its continuous and enclosed conveying combined with dedusting and sound insulation makes this system environmental friendly.

Stationary unloading systems are normally used to save money required to build a quay or jetty, using the necessary dolphins for ship mooring. Barges or ships can be moved with more or less difficulty depending on existing currents.

The base foundation is an important point because it must be planned carefully to support the load of the equipment and take into consideration all local interferences and interfaces.

Types of installations

On rivers for small ships

In Europe, rivers are often used to distribute grain and derivatives to flour and feed mills. Ship sizes vary from 300 to 5,000 dwt. Waterways are smaller yet longer due to many channels being constructed to connect the waterway systems.

The operation is normally performed by one or two people. With small ships, clean-up is done using a flat suction nozzle with wheels connected with a flexible hose. The operator uses a radio remote control to operate the boom and can sweep (if required) while the system is sucking.

Feedstuff unloading at Garant in Austria

Using a rotating nozzle feeder with necessary structure reinforcement, the pneumatic unloading system is ideal for non free flowing materials. A traffic road divides the unloading place with the Feed Mill. The Danube river region is a tourist area with a bicycle path along the waterway, one more environmentally advantaged reason for use of the pneumatic system.

Because different products are handled, the equipment blowers are controlled with frequency inverters. The operator can adjust the speed to the product and control the capacity. This is very useful for handling products with different specific weights, such as sunflower seeds (0.35 t/m^3) or heavy wheat (0.8 t/m^3).

Malt unloading at Schill and Kling Germany

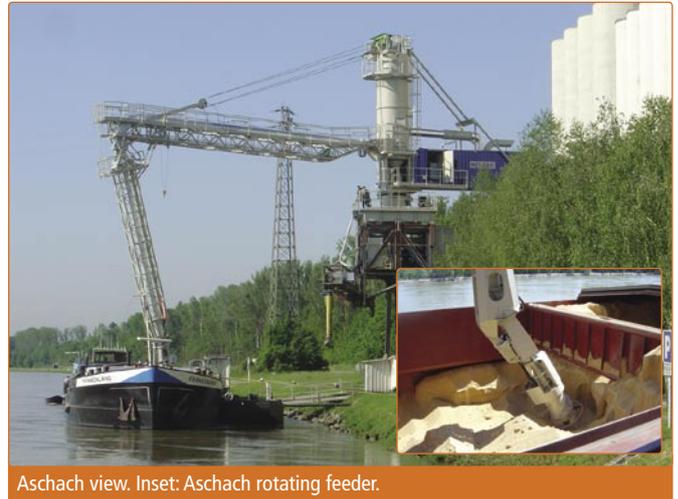
To the right are two examples of unloading malt from small vessels. Schill was an existing plant which was upgraded, while Kling was a new installation. Both have the ability to perform ship loading.

On river for barges

In export countries in South and North America, pneumatics are used to convey grain and bi-products from production to distribution ports. In importing countries, the barges are distributed to customers along waterways.

Barge unloading at URC in the Philippines

In this case two barges are positioned to simultaneously facilitate the convoy composition. Details of the barge show the local difficulties encountered with the way the bottom of the available barges are shaped.



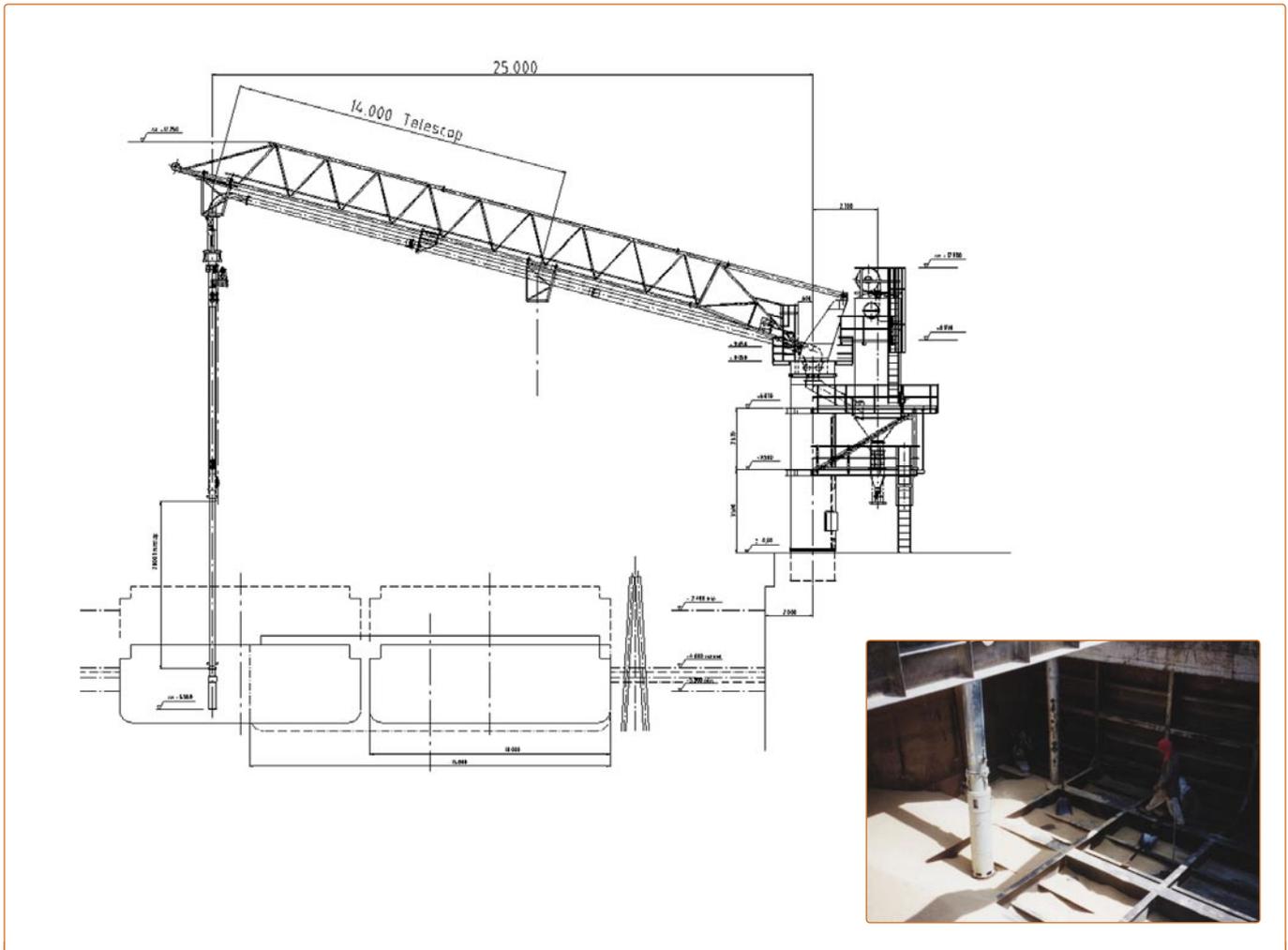
Aschach view. Inset: Aschach rotating feeder.



Schill Malt view. Inset: Nozzle.



Kling Malt view. Inset: Nozzle.



System Layout. Inset: Barge bottom.

Barge unloading at Dreyfus in Brazil

Soybeans from the new agricultural frontier in Brazil are transported along rivers by barges where possible. In this example transferring the soybean to rail is required. The project was done in two steps because of the urgency to get operations going quickly ahead of harvesting time. At first it began with mobile unloaders on the platform. In the second stage the unloading area was covered, this decreased stoppage time by not having to stop work when it rained. This enabled better predictability and the use of the entire installation.

Barge unloading at Cargill and Owensboro Grain in the USA

At Owensboro Grain they are able to achieve a high average capacity as they are also able to work in the rain. The process at Owensboro involves inserting a vertical pipe into the hatch cover and pushing the product towards the nozzle using a bobcat.

In the Cargill picture you can see the boom being lowered to the ground. This is possible through the use of a boom rope winch, which also makes inspection and maintenance easier.



Before cover. Inset: With cover.



Owensboro Grain.



Cargill.



General installation view. Inset: Foundation leg.



Foundation ring.

On seacoast for large ships

The problem here is minimising movement of the large ship, which requires the need of a large working range.

Perdue Farms in the USA

In this scenario the unloader is used mainly to unload barges but is designed also to unload large vessels. This makes it possible, for example, to unload soybeans coming from Brazil at harvesting time instead of buying (normally more expensive) stored beans.

Previously a mechanical unloading system was used but it had environmental and operational problems. The foundation in this case had to be small as possible in order to take up as little space as possible. It incorporates a foundation ring.

Soya Hellas in Greece

Like Perdue the unloader here has a three part horizontal telescopic pipe in the horizontal boom which provides a large working range area. Here the existing foundation required a new mounting arrangement with extra legs to distribute the load to the piles.

The auxiliary winch is also large enough to handle pay loaders up to eight tonnes which are used in unloading of soybean meal.

ABOUT THE AUTHOR

Tomas Kisslinger has twenty years experience in bulk handling, especially in grain related areas. He has been Managing Director of NEUERO Industrietechnik since 1992.

ABOUT THE COMPANY

NEUERO is a manufacturer of mobile pneumatic conveyors, grain vacs and ship unloader/loaders for transport of bulk materials such as bulk grain, meals, plastics and alumina.

NEUERO started in pneumatic grain conveying over 80 years ago with the manufacture of small agricultural machines. Since then, the company has delivered equipment in the 20 t/h to 2,000 t/h range to many installations around the world. NEUERO has two companies with sales, engineering, manufacturing and service facilities in Germany and in the US.

ENQUIRIES

Tomas Kisslinger
NEUERO Industrietechnik
Neurostr. 1
49324 Melle
Germany

Tel: +49 5422 9503 20
Fax: +49 5422 9503 50
Email: tk@neuro.de
Website: www.neuro.de