

# New grain and fertiliser terminal in Djibouti on the African East Coast

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The Djibouti Republic is located in the Gulf of Aden north of Somalia and across from Yemen, all located at the southern end of the Red Sea between Africa and the Arabic Peninsula. This small country of about 23,000 square kilometres and less than 800,000 inhabitants has traditional excellent trade relationships with nearby countries. For instance its port plays an important role for supply of goods to Ethiopia.

At the end of 2005, the company SDTV (Compagnie Djiboutienne de Gestion du Terminal Vraquier) awarded Vigan Engineering S.A as the main contractor for the construction and delivery of a new grain and fertiliser terminal in Djibouti.

The main terminal criteria for this new and state-of-the art terminal are:

- The fast and efficient unloading and loading of cereals and fertilisers
- Minimising port congestion and waiting time for bulk vessels
- Increase the development of Port Authority operations and the host country in general
- Generate local employment and partnerships
- Expedite food aid cargoes (World Food Programme) and fertiliser shipment to neighbouring countries

The investment of about US\$ 40 million realised during the period 2006 – 2007, was financed by:

- MIDROC group (owned by Sheik Mohammed Hussein Hussein Al Amoudi)
- African Bank Development
- Islamic Corporation for the Development of the Private Sector

MIDROC group is a conglomerate of companies with activities in the petroleum industry as well as many other areas such engineering and construction, tourism, manufacturing, real estate, logistics, etc.

The new terminal has already received several ships since its inauguration on December 21, 2006. According to Michael Nzai, Operational Manager of the SDTV (Société Djiboutienne du Terminal Vraquier), the unloading of the Liberty Grace, which arrived on January 9th, was carried out in four or five days, thanks to two Vigan pneumatic unloaders (300 MTPH each) and several belt conveyor systems with a discharging capacity of more than 10,000 tonnes per day. This kind of operation in the past has lasted for 10 to 12 days. The bagging operations started the following day thanks to the 12 weighing scales and bagging units.

The fertilisers unit will enter into operation by the second half of 2007.

## Main characteristics

The annual volume of one million tonnes to be discharged will be divided between agribulks and fertilisers with a variable percentage between them according to the economical and market conditions in Djibouti and nearby countries.

On an area of 30,000 square metres bordered by a quay of 350 metres are two main warehouses: one for agribulks and the other for fertilisers.



Cereals are handled thanks to a belt conveyor system which allows them to be either stored into the warehouse which is equipped on its top central area with a conveyor or moved directly to the weighing and bagging stations for direct loading onto flat type trucks.



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Each one's dimensions are 144 x 40 metres and have between 30 and 40,000 tonnes of storage capacity according to the product characteristics. The grains to be handled are mainly corn and wheat; most of the fertilisers will be DAP and urea.

## Cereals

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Among the latest technological advances of these pneumatic unloaders are their special wear resistant alloys as well as having fully automatic controls for minimum energy consumption thanks to their frequency inverters.

This kind of equipment was preferred over grabs, the main advantages in being:

- An overall better unloading capacity: 10,000 tonnes per day in comparison with grabs, both alternatives with a maximum output of 600 metric tonnes per day. Indeed the easy finishing of the hold means an average efficiency of around 70 – 80 per cent for pneumatic unloaders and 50 – 60 per cent for grabs.
- No spillage: totally enclosed handling system from ship hold to inside the warehouse.
- Minimum concerns about the pneumatic unloader operation. A grab crane would have resulted in too many and potentially dangerous mechanical movements of the whole equipment (engine room, boom with its ropes and grabs) on the slewing ring. The man power factor and its consecutive possible casual errors also entering into consideration.

Once unloaded, the cereals are handled thanks to a belt conveyor system which allows them to be either stored into the warehouse which is equipped on its top central area with a conveyor (a tripper allows for the all around distribution of the cargoes, maximising the volume availability for storage) or moved directly to the weighing and bagging stations (twelve units) for direct loading onto flat type trucks.

The reclaiming of the stored products is carried out by several pay loaders on rubber wheels. A hopper at ground level handles grains onto an inclined belt conveyor towards the conveyors system to the bagging stations.

The 12 packing lines (six for grains and six for fertilisers, each one with a capacity of 1,200 50kg bags) allow for truck loading at a rate of 360 tonnes per hour.

As these lines are situated at five metres above ground level, the trucks can, on one side be queuing in line before entering under the corresponding bagging station, and on the other side, they can be loaded with bags which will fall down their platform thanks to an inclined sliding ramp with belt.

## Fertilisers

The same general handling principle applies for the unloading, storage and dispatching of the fertilisers.

In this case a Liebherr LMH 250 rope crane with grabs will deliver the goods on a quay hopper into the conveying system.

This hopper, also self propelled on rails (land side) and rubber wheels (sea side), handles the fertilisers onto a belt conveyor along the external wall of the warehouse which is specifically designed for these types of chemical products.

## General

When completed by the middle of 2007, the whole system will have about 950 metres of belt conveyors, most of them with a 600 metric tonne per hour capacity.

Several diesel generator sets with a total capacity of 1,700 KVA will guarantee a totally independent energy supply for the whole terminal.

A control room, with a synoptic panel as well as special state-of-the art hard and software, will complement the installation. It will allow a complete supervision of all unloading, conveying, storage, weighing, bagging and dispatching of the goods.

Many different devices such as speed, overload, temperature and other sensors are connected to the central control desk where the operation supervisors have the capability of monitoring the whole operation and recording all the data necessary in order to continuously improve its efficiency as well as also optimise the maintenance of all the equipment.

The new Djibouti grains and fertilisers terminal is not only a well suited installation for its main economical objectives but certainly also for its significant social benefits thanks to the improvement of the whole regional food and agricultural input supply.

### ABOUT THE AUTHOR

Alain de Visscher has been Commercial Director of Vigan Engineering for 10 years after a 23 year's career in the animal feeding sector in several countries around the world.

### ABOUT THE COMPANY

Since its foundation more than 35 years ago, Vigan has manufactured more than 1,100 pieces of equipment, installed all over the world. Vigan mainly specialises in pneumatic machines with capacity ranges of 60 to 1,200 metric tonnes per hour including: Mobile products such as all kinds of cereals and oilseeds, animal feed raw materials, chemicals and fertilisers. Slightly compacted products like soy bean meal can also be handled.

### ENQUIRIES

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