Export Terminals for Asia

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Asia is now experiencing an excess cement capacity of almost 70Mta, a complete turn-around from the shortage seen only one year ago. Several large cement plants are still under construction and will be completed in 1998/99 which will further add to the over capacity. Exporting cement is now an immediate requirement. This article describes some possibilities to establish export operations within a short time-frame.

Asia, in general, is not very well geared for cement and clinker exports. The majority of plants are located inland and even those that are located close to the sea do not always have the deep water facilities for the ships which travel long distances.

Export prices for cement are falling to below US$25 per tonne level. As a result, the economic viability of shipping product via the Panama and Suez Canals has become a reality, which means Asian cement is travelling worldwide!

A traditional export terminal including the planning, permitting, construction of silos and large shiploading equipment would take several years to realise. Establishing an export operation within a short time period may mean using unconventional methods but it also means waiting months instead of years for it to be realised.

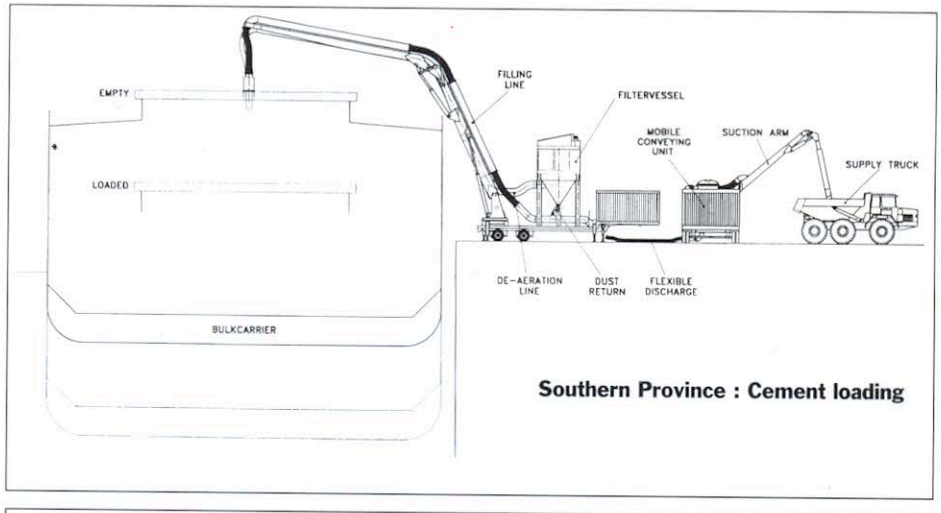
No Storage!

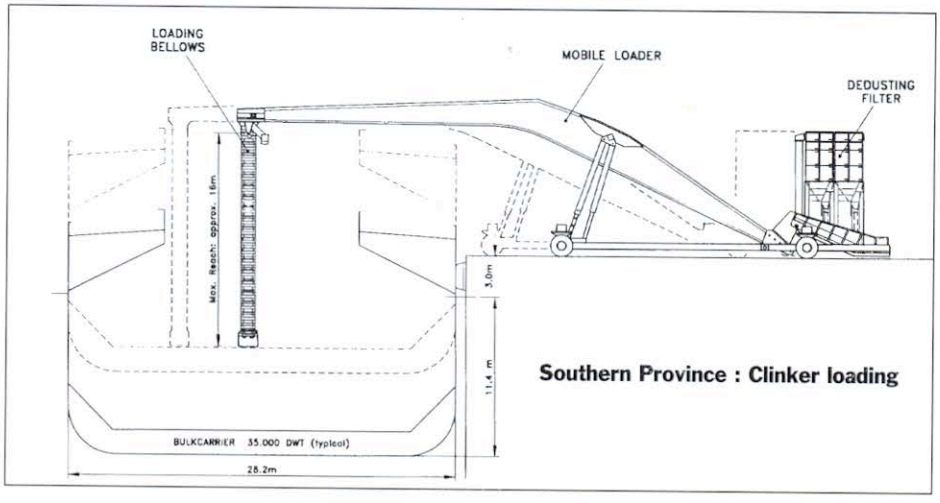
Building a storage facility in a port is one of the most time consuming parts when establishing an export terminal. However it is possible to start without it.

As an example, Jordan Cement started its export operation in 1989 by bringing cement to the Port of Aquaba in large tipper trucks. Two mobile Kovako unloaders then vacuumed the cement from these trucks and conveyed the cement into large bulk carriers, through a simple pipe system. When the cement storage facilities were subsequently built, the unloaders conveyed the cement into the storage domes. Delivery of these unloaders is generally between four and six months although some firms do rent or lease them.

Halla cement in Korea with high capacity shiploaders for cement distribution.

Cement and clinker export equipment for Southern Province Cement, Saudi Arabia. Large tipper trucks bring cement and clinker to the port where special loading equipment ensures direct conveying from the truck to bulk carriers.





Southern Province Cement in Saudi Arabia recently ordered export systems for clinker and cement. Here also, no storage facility is used. Clinker will be loaded onto the ships by means of a mobile belt conveyor with loading bellows and a dump hopper with dust extraction. Cement is unloaded from the trucks by a 400tph Kovako unit that transfers the cement from the trucks and blows it into the ship by means of a special mobile loading arm. This arm comes complete with a return line and dust collector unit to extract the dusty air from the hold. These systems are scheduled to start operation in July of this year.

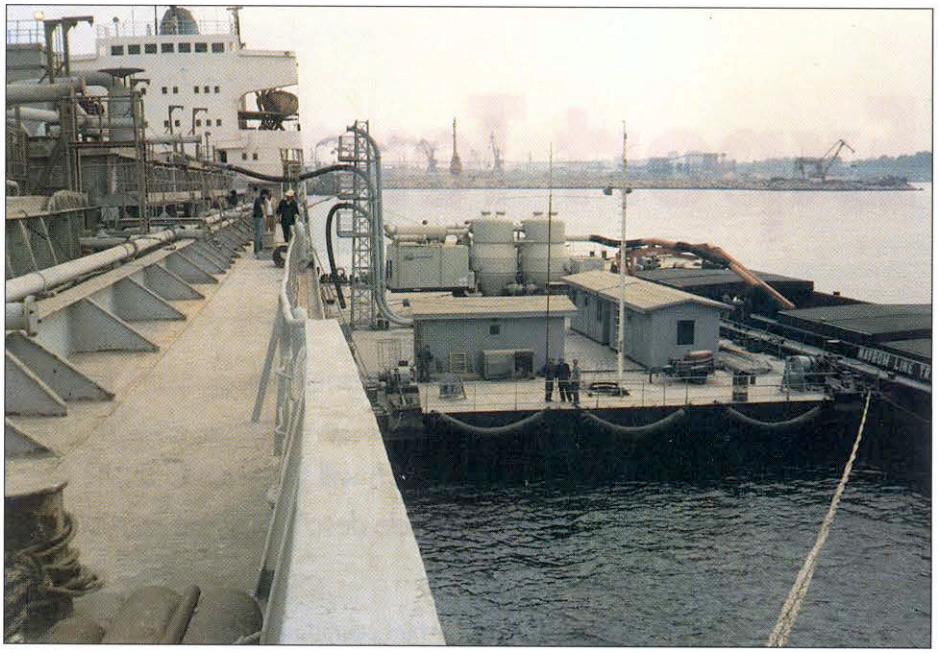
No Dock?

If no deep water berth is available, but the ship can anchor within 200 metres of the shore, then a barge and floating pipeline system can be used. Cement can then be unloaded from trucks and blown to the ship loading arm on the barge by using a pneumatic conveying system.

Midstream Transfer

Some cement plants in Asia are using river barges or coastal vessels to distribute cement but do not have the facilities to load big ships. A midstream transfer by using a floating transshipment unit would enable the cement to be unloaded from these barges into the bulk carriers.

This system has been used by Crescent Ltd in Romania since 1985 and in 1995 they added a second unit to increase their capacity. At present two 300tph Kovako units are used to unload cement from river barges to the port by vacuuming the cement from the barges and blowing it along a pipeline to the centre of the hatchcovers and into the holds.



Midstream transfer of cement from river barges to bulk carriers in the port of Constanza, Romania has been undertaken for many years and could be a suitable solution in Asia.

Reverse the Import Terminals

Existing import facilities in Asia which have both deep water berths and large storage facilities can have their functions reversed if necessary. A very good example is the terminal operated by Indocement in Tanjung Priok which was originally a domestic distribution terminal. In 1994 when there was a shortage of cement in Indonesia, Indocement purchased a 400tph Kovako shipunloader which was mounted on a barge. By adding bulk truck loading equipment Tanjung Priok became a highly effective import terminal. As the market situation changes so can the terminal, which is currently being used for exports. The flexibility means that imports, exports and domestic distribution capabilities are all possible.

Flat Storage

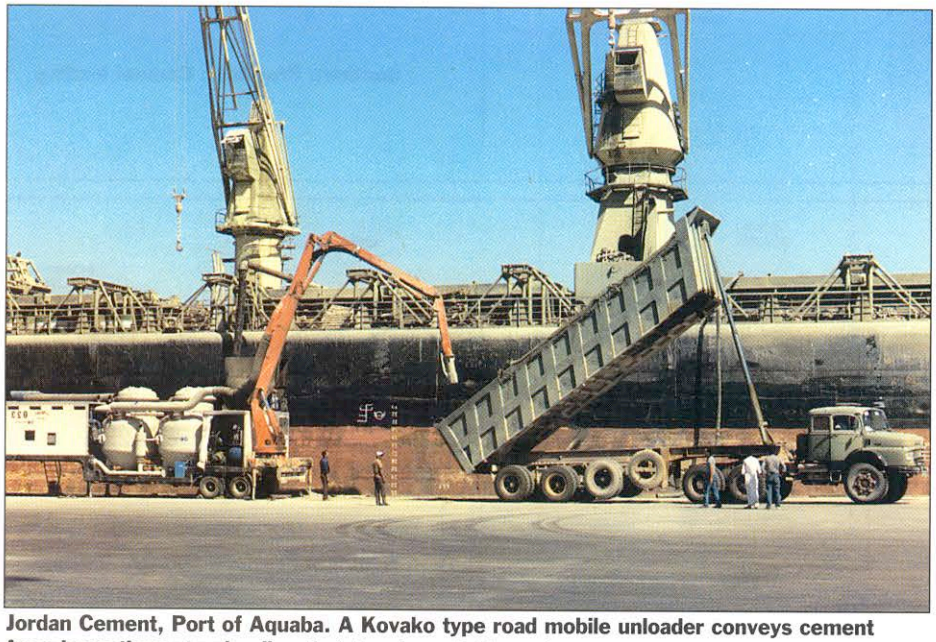
This type of terminal can be realised within a few months and is also suitable for use as an export terminal. Old cargo warehouses generally can be converted to cement or clinker storage quickly. By adding truck or railcar unloading systems and ship loading equipment they become useful export facilities.

Permanent Export Facilities

Establishing export facilities quickly is at the moment an important requirement, but once the market situation has stabilised Asian cement companies will have to re–think their long term strategy.

Flexibility is obviously an answer to economic fluctuations when addressing the problems of import, export and regional distribution.

Multipurpose facilities equipped with efficient high capacity and permanent loading equipment will be a requirement to meet this flexibility.



Jordan Cement, Port of Aquaba. A Kovako type road mobile unloader conveys cement from large tipper trucks directly into a large bulk carrier.

• Raw materials will probably be industrial wastes or ores of a low grade and wide variation in composition. 30 to 50 per cent of waste produced by other industries could be recycled and used by the cement industry. These materials would be used mainly as raw material or admixtures, depending on the condition of the country.

• Energy consumption will be lowered by reducing the heat consumption of clinker to 2509J/Kg from 2927J/Kg, which is the lowest level at present. Comprehensive consumption of cement will be reduced as a result of stricter environmental protection requirements.

• A breakthrough could be made in waste heat power generation from used gas. Some cement plants may even become self sufficient in electric power.

• Production management and process control systems in cement plants will be better regulated. Multi-media computer workstations and specialised robot systems will form efficient and practical networks for operating, monitoring and adjusting control and management functions. Cement plants will be able to run in harmony with the environment efficiently and with long term stability of production, supported by reliable equipment.

• Measures for protecting the environment through inner circulation of kiln gases and a self-cleaning system of waste gas, material and water will be implemented across the board and improved continuously.

• The cement industry will be ideal for making use of flammable wastes and reclaiming secondary energy as well as producing cement clinker. The eco-simulated genus pair formed by cement plants and waste disposal plants will guarantee the smooth implementation of a development strategy.

• China will be a model for other cement producers globally in terms of yield, quality, variety, environment protection, waste-free production and the establishment of an eco-simulated genus pair.

Table III : Environment protection inner-circulation technology and self-cleaning measures for waste material, waste gas and waste water within the cement industry.

Pollutants	Prevention Technology	Absorb rate of pollutants (%)	By-product	Emission of hazard gas (mg/Nm^3)	Sludge discarded or dust
	Correct kiln and calciner design and the adoption of automatic control system				
	Raw meal absorption method	50 to 60	None	below 400	None
	Lime absorption method	to 50	None	below 400	None
SO_2	Gas suspension absorption tower (GSA) [1]	90	None		Small amount of slag, used as admixture or to build roads.
	Grate absorption bed [1]	80	$CaSO_4$, used as retarder	below 100	None
	Optimum kiln and calciner operation and the apply of automatic control system				
	Use coal burner with low NO_x generation				None
NO_x	Selective non-catalyst reduction (SNCR) [1]	80	None	below 200 to 300	None
	Low NO_x generation ILC such as Prepol MSC or FLS	60		to 800	None
	Selective catalyst reduction (SCR) [1]	90		below 200 to 300	None
	Movable layer type active carbon filter polvitec [1]	90		below 200 to 300	None
CO	Corrective kiln and calciner design and operation, use automatic control system		None	50 to 100	None
Kiln dust	Fluidised bed reclamation system (FBR)	100	Potash fertiliser	Meets environment protection standards	Little slag with no harm, landfilled
Dust	Bag filter and EP	>99	None	None	Little dust with no harm emitted into atmosphere.

[1] : Also has the function of absorption and decrease of other harmful gas and heavy metal elements.