



*Nordströms  
Siwertell*

Tremont House, Galveston, Texas, USA

## Kuwait Portland Cement Company Kuwait



**Presented by Mr. Peter Goransson, Sales Manager & Advisor, Bulk Handling Division, MacGregor Bulk AB**

We are known as

**BMH** MARINE

Our new name is

**MacGREGOR Bulk**

A decision was taken by Kuwait Portland Cement Company to create a modern, high capacity bulk cement import terminal to increase the annual intake capacity of to the terminal.

Since the volumes were increasing, a higher degree of flexibility as well as higher unloading rates were required.

In other words,

*- A new concept to handle bulk cement delivered by bulk ships was on the agenda.*



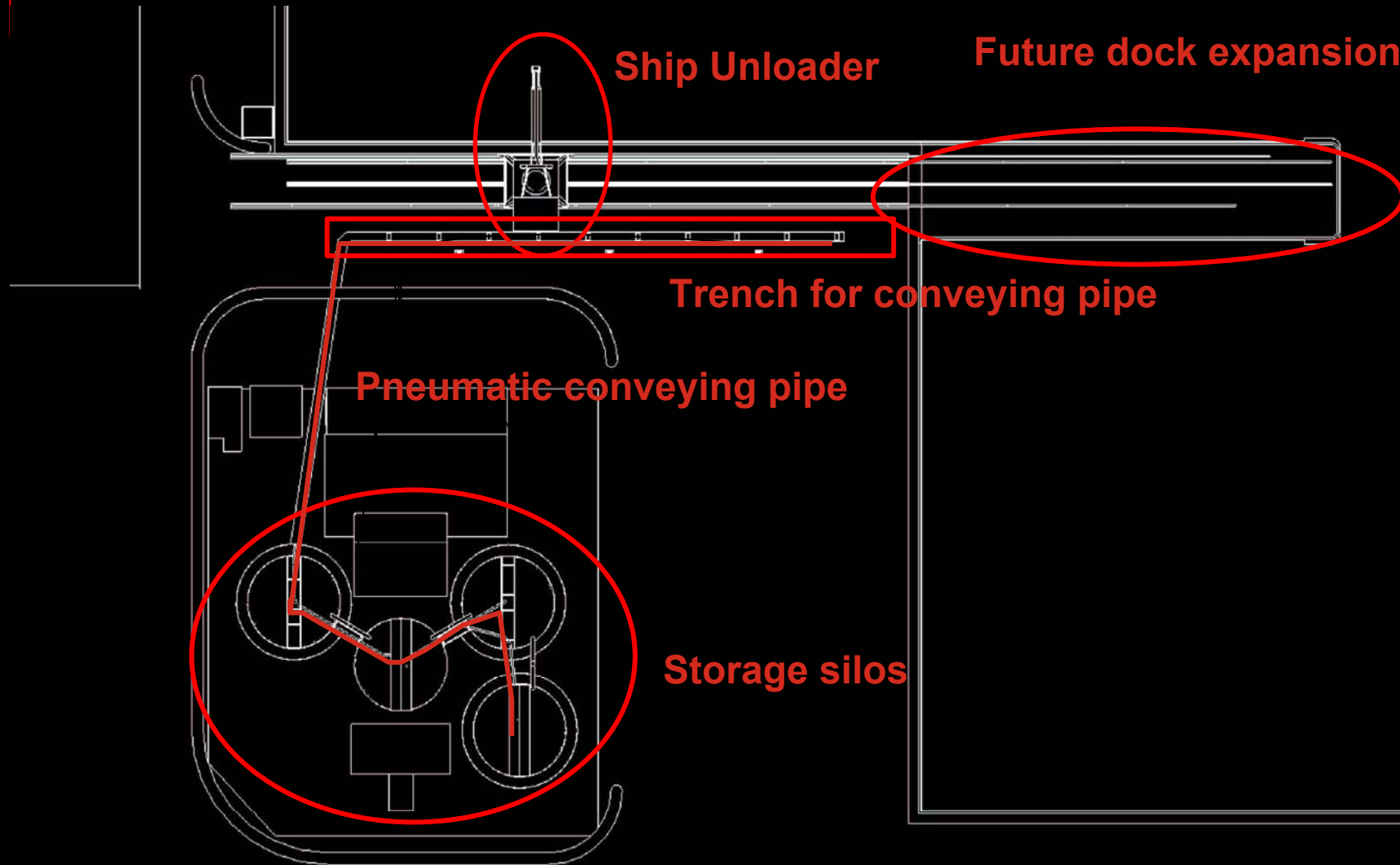
In late 2002, BMH Marine was invited by Kuwait Portland Cement Company, to study the ongoing cement import operation aiming at presenting a proposal how to upgrade the materials handling equipment at the Shuwaikh terminal in Kuwait. This investigation resulted in a request for tenders from all major suppliers for a ship unloading system comprising:



- Ship unloader
- Conveying system
- Distribution to silos
- Complete electrical control and distribution system
- Transportation
- Supervision of erection
- Commissioning
- Training

# Original terminal overview

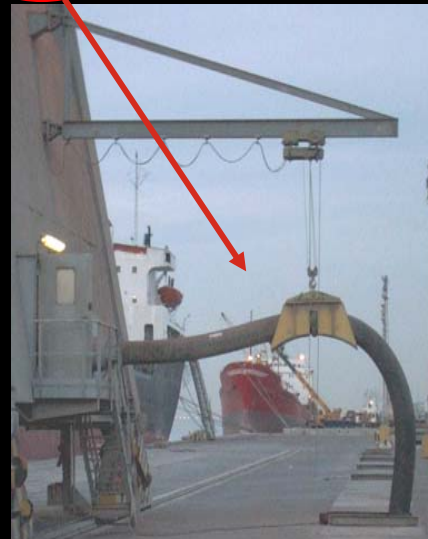
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# On site observations

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Pneumatic Ship Unloader  
connected with heavy rubber  
hose.

Ship Unloader not moving during  
unloading due to hose connection.

Time consuming to move Ship  
Unloader from one position to  
another, 30 – 60 minutes

Low unloading rate, only about  
200 t/h in average

Unloading operation requires  
much manpower

Power consumption: 13,5 kWh/ton

# Upgrading proposal

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**BMH Marine proposed the following system to upgrade and modernise the terminal:**

New rail bound Ship Unloader nominal capacity 800 t/h

Movable transfer arrangement to quay belt conveyor

Quay belt conveyor fully enclosed

Transversal belt conveyor to silos fully enclosed

Vertical screw conveyors to lift material to the silo top

Aero slide distribution system on silo top

New process control system based on PLC

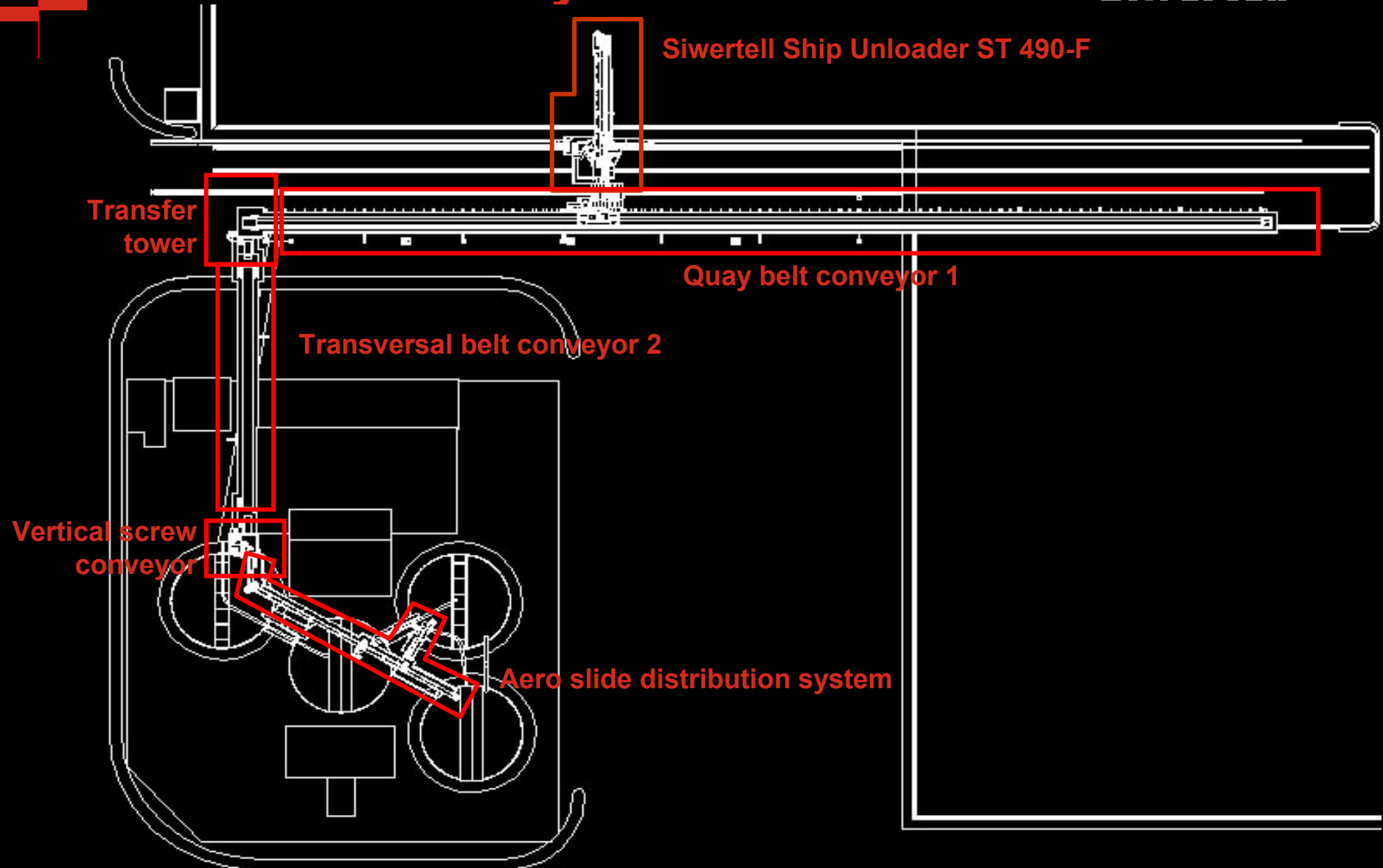
New motor control centre for new equipment

Cement dust control system



# New terminal layout

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# Siwertell Ship Unloader ST 490-F

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- Ship unloader: model 490-F, no. 59
- Ship size 35,000 dwt or beam 28m
- Capacity rated: 800 mt/h
- Capacity peak: 900 mt/h
- Required power: 360 kW
- Weight 250 mt, incl. c/w 83 mt
- Auxiliary hoist 10 mt capacity
- Max. wheel pressure: 25 mt/wheel
- Portable Radio control unit
- Additional features:
- Siwertell Monitoring System
- Direct loading of bulk trucks

# Movable Transfer Trolley

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## Purpose:

Transfer the unloaded product from Ship Unloader to shore conveying system without interfering with the operation of the Ship Unloader.

## Advantage:

Gives an environmentally safe transfer of the product to the receiving system.

Increases the efficiency of operations



# Belt conveying system ship to silo

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## Belt conveyor data:

Total length: 171 m

Belt width: 1400 mm

Power installed: 37 kW

## Belt conveyor particular features:

Fully enclosed open top design with cover belt

No conveyor gallery needed

Easily accessible through removable side panels

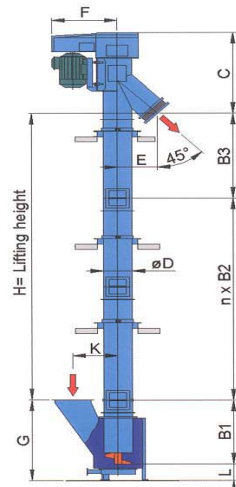
# Vertical screw conveyor VSC

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## Nordströms Vertical Screw Conveyors type VSC

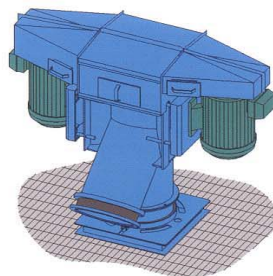
### Type VSC 200 - 500

Single motor drive



### Type VSC 300 - 700

Twin motor drive



#### Special features

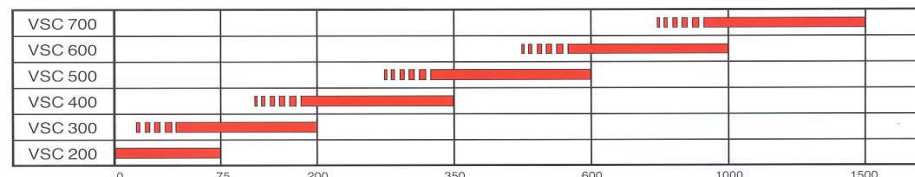
- Long-life intermediate bearings, specially developed
- Single or twin motor drive
- Fluidized loading box
- Conveying with different angles of inclination
- V-belt transmission
- Speed guard included

#### Dimensions (mm)

	B1	B2 (max)	B3 (max)	C	øD	E	F	G	K	L
VSC 700	1600	4800	3850	1900	711	925	1600	1800	1000	325
VSC 600	1600	4800	3850	1800	610	825	1550	1600	900	325
VSC 500	1350	4800	3850	1600	508	700	1400	1600	800	325
VSC 400	1100	4200	3500	1400	406	600	1300	1250	650	300
VSC 300	900	3500	2900	1100	324	470	1000	975	500	275
VSC 200	650	3000	2700	800	219	370	800	800	400	225

We reserve the right to make changes.

#### Capacities (m³/h)



Capacities in m³/h based on vertical conveying of cement

**Delivered since the 1950s**

**Compact design**

**Requires little space**

**Completely enclosed**

**Spillage free**

**High capacities 100 – 1500 t/h**

**Requires little maintenance**



# Vertical screw conveyor VSC

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## **Screw conveyor data:**

Total lifting height: 61 m

Conveyor size: VSC 600

Installed power 2x200 kW per unit

## **Screw conveyor particular features:**

Fully automatic lubrication system

Drive unit dimensioned to restart a fully loaded conveyor

# Aero slide conveyors

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## Aero slide conveyor data:

Conveyor size: AS 630

Declination: 7°

Installed power 30 kW



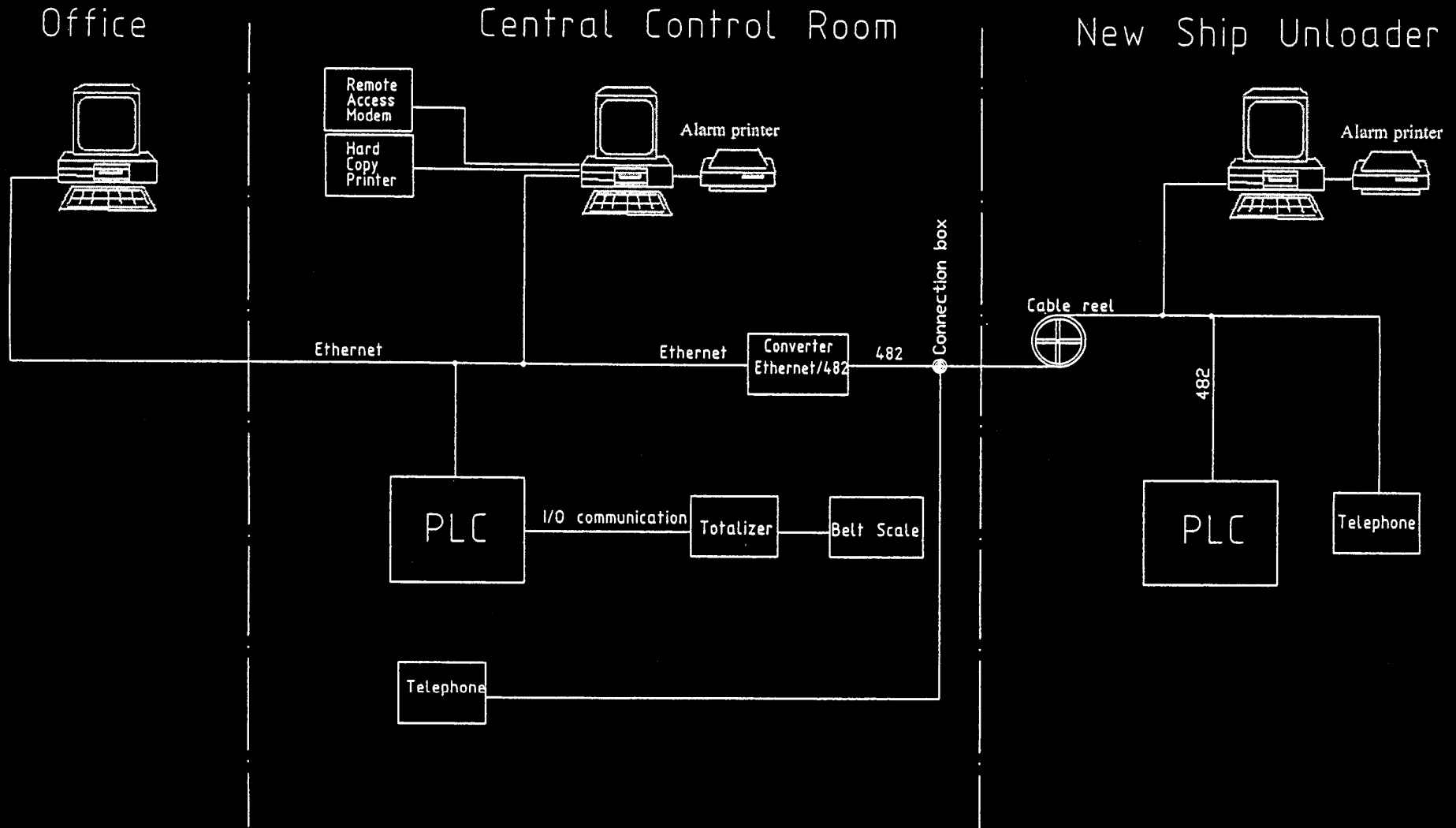
## Aero slide conveyor particular features:

Remote operated  
distribution valves



# Process system configuration

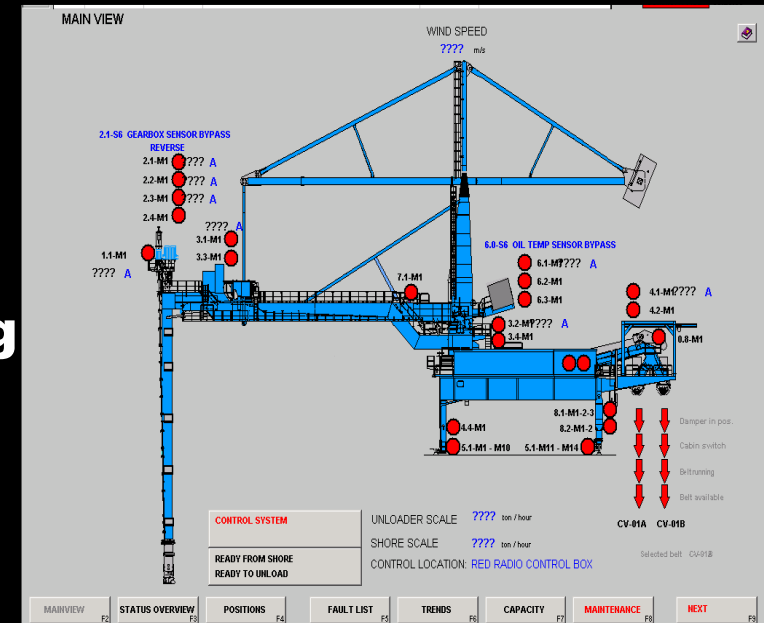
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# Control Systems SIMON

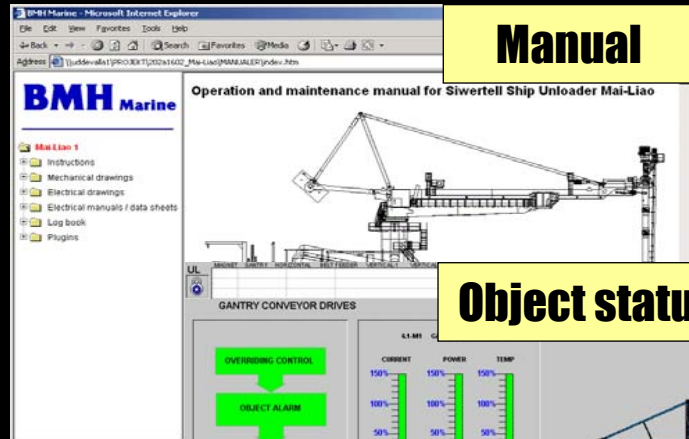
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- The SIMON system is computer (PC) based with “no limits”
- Separate screens
- Better graphics and resolutions
- Better way to store historical data
- Provides help for quicker fault tracing
- Functions, such as manuals and service reports
- Storing mechanical and electrical drawings

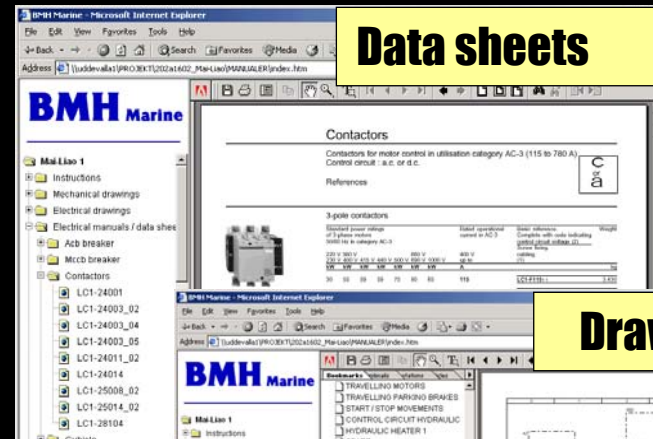


# SIMON typical menus

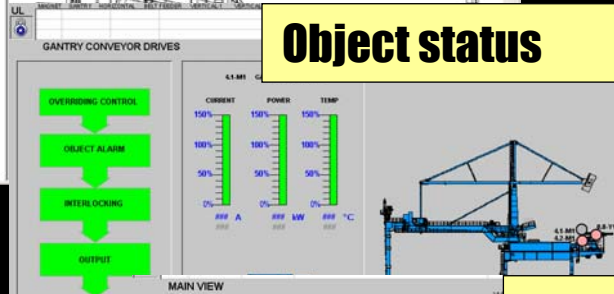
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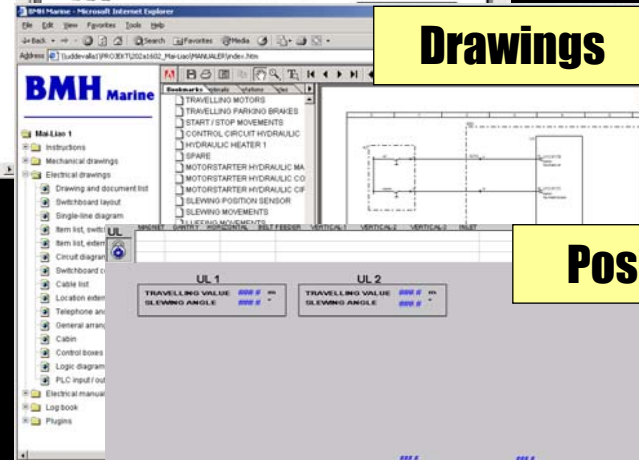
**Manual**



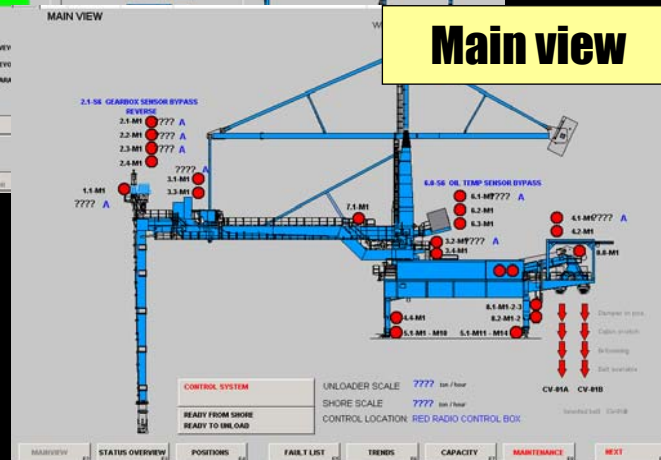
**Data sheets**



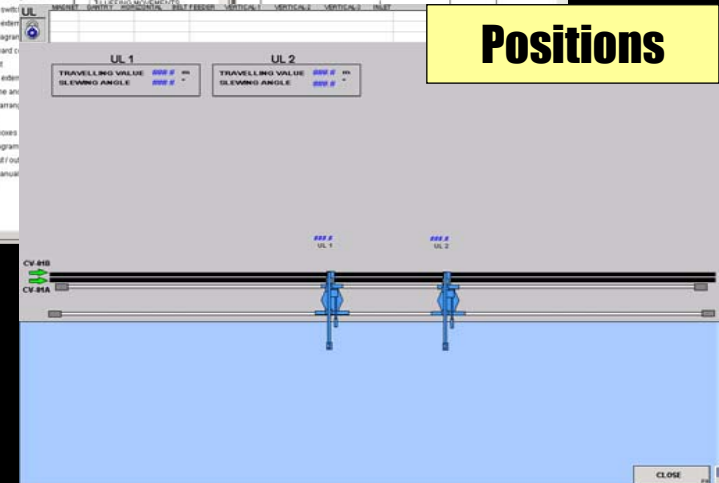
**Object status**



**Drawings**



**Main view**



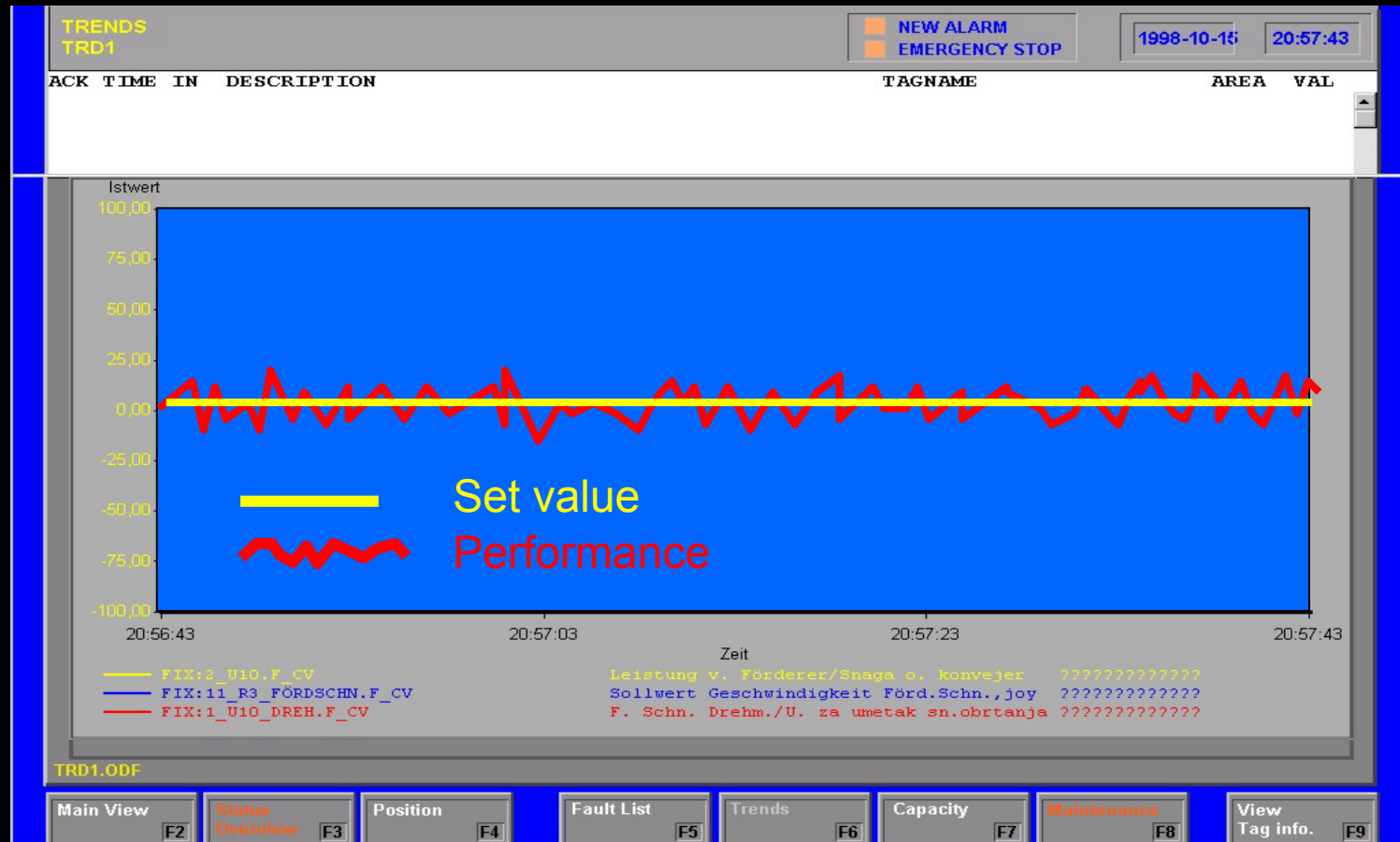
**Positions**

# SIMON, actual performance

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The actual performance is within  $\pm 10\%$  of the set value.

This means the peak capacity is only 10% above the rated capacity



# Additional unloading capacity

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During the delivery/installation period of 12 months for the new terminal system, a Siwertell 10 000 S Ship Unloader was ordered and delivered to site within 3 months



The Siwertell 10 000 S with a dual truck loading system can operate in ships up to 15 000 dwt with an hourly unloading rate of 300 t/h.





# Siwertell Ship Unloader 10 000 S

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**Siwertell Ship Unloader 10 000 S in full action loading to two trucks**





- The modernised cement terminal became operational in June 2005
- Cargo handled is Portland Cement
- Up to the month of October 2006, 80 ships of various sizes have been unloaded
- Total amount of cargo unloaded is approx. 1,818,000 ton

## OPERATION

- Normal operation is based on a continuous operation. For such operation 4 operators are required.

## MAINTENANCE AND SERVICE

- The maintenance and service team is manned and organized as follows:
  - One (1) Foreman
  - One (1) Electrician
  - Two (2) Mechanics

Maintenance	Service
<p>Preventive maintenance is of visual nature and a continuous process.</p> <p>Periodical maintenance should be carried out at following intervals:</p> <ul style="list-style-type: none"><li>• Every month or 100 operating hours</li><li>• Every 200 operating hours</li><li>• Every 6 months</li><li>• Every year or 500 operating hours</li></ul>	<p>Service history is very short. So far, this activity is limited to replacing wear parts only</p> <p>Parts repaired or replaced can be summarized as follows:</p> <ul style="list-style-type: none"><li>• A drive shaft for the gantry conveyor</li><li>• Minor components in the electrical system</li></ul>
<p>A recommended set of spare parts comprising strategically and wear parts to a value of US\$ 100,000.- was included in the delivery. A majority of these spare parts are as of today still not consumed.</p>	

# Power consumption

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Equipment	Installed power (kW)	Required power* (kW)	Power consumption* (kWh)/ton
Ship unloader	519	360	0,45
Shore conveyor	863	635	0,79
Distribution system	30	30	0,04
Total	1412	1025	1,28

\* valid at rated capacity

**Objective:** Create a modern, high capacity bulk cement import terminal

## Achievements:

**High capacity:** Free digging capacity: max. 992 t/h  
TTS capacity: average 440 t/h

**Energy consumption:** 1,28 kWh per unloaded ton

**Conclusion:** With a rail going Siwertell Ship Unloader combined with a Movable Transfer Trolley and a combination of different shore conveying system it is possible to create a high capacity terminal with low energy and maintenance cost at an affordable price

# MacGREGOR offices in Sweden and abroad



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