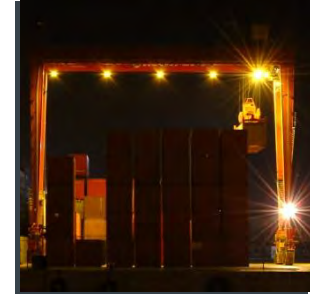
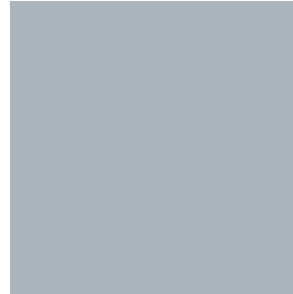





Kalmar RTG



Achieving higher efficiency on RTG crane operation

Jari Jylhä, 28-29 May 2015, 4th Black Sea Ports and Shipping 2015 Turkey

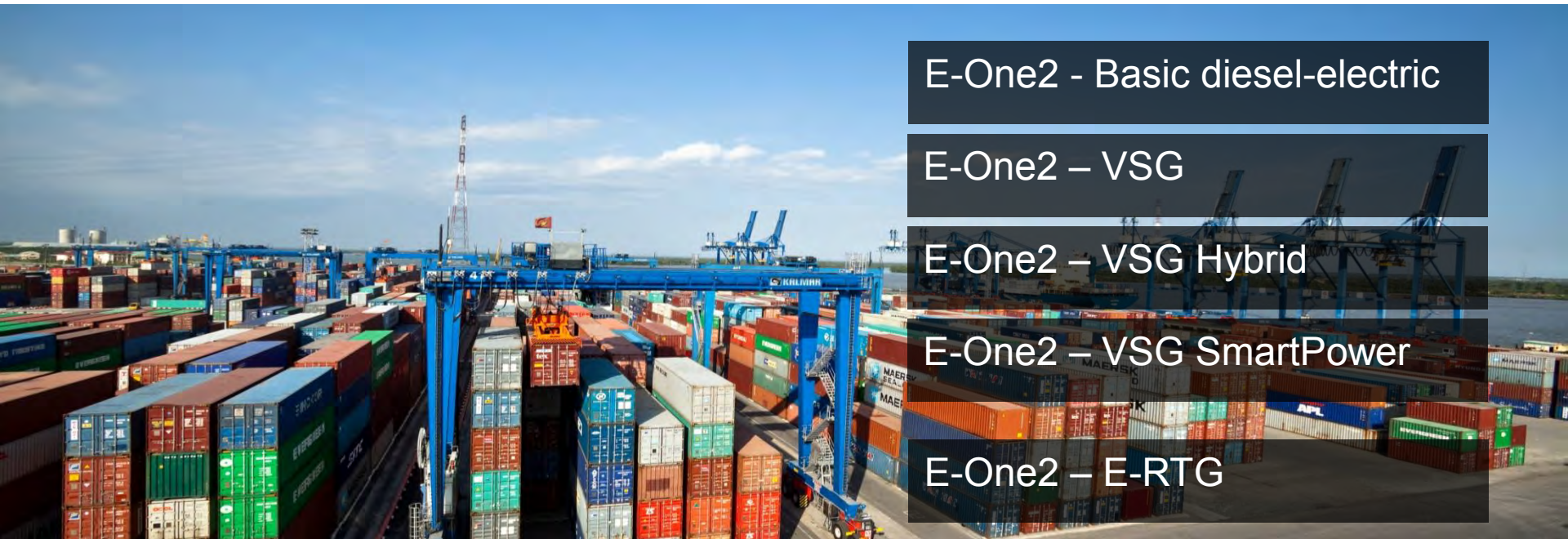
An aerial photograph of a large container port. The foreground and middle ground are filled with numerous stacks of intermodal containers in various colors, including dark blue, brown, and red. Several large red gantry cranes are positioned around the stacks, some with their booms extended. In the background, a body of water is visible with a few ships and a distant shoreline under a cloudy sky. A semi-transparent dark grey rectangular box is overlaid in the center of the image, containing white text.

**One in four container movements
around the globe is handled by a
Kalmar solution.**

An aerial photograph of a large container port. The foreground and middle ground are filled with numerous stacks of intermodal containers, mostly in shades of brown and grey. Several red Kalmar RTG (Rubber Tyre Gantry) cranes are positioned throughout the yard, some with their jibs extended over the stacks. In the background, a large container ship is docked at a pier, with more cranes visible along the waterfront. The sky is overcast with grey clouds.

Over 1000 Kalmar RTG

Kalmar E-One² Models:



E-One2 - Basic diesel-electric

E-One2 – VSG

E-One2 – VSG Hybrid

E-One2 – VSG SmartPower

E-One2 – E-RTG

E-RTG

ZERO EMISSION

E-RTG - Zero Emission options

■ Cable reel



■ Busbar





Busbar system



E-RTG – ZERO EMISSION

- 2014 almost half of Kalmar RTG sales was E-RTG
- Over 150 sold Kalmar E-RTG
- Most of deliveries with cable reel
- Almost all of Kalmar diesel RTGs retrofitted to bus bar system in Turkey
- Kalmar do also bus bar retrofitting to 3rd party RTGs
- Kalmar can provide both Vahle and CW bus bars

E-RTG – RETROFITTING

Marport, Turkey

Electrification of 35 RTG's, brand Noell & GPC

27 Noell, 8 GPC RTG's: Electrification of RTG and installation and commissioning of manual plug-in solution (dual sided).- Conductor bar system.



Yilport, Turkey

Electrification of 18 RTG's, brand Mitsui

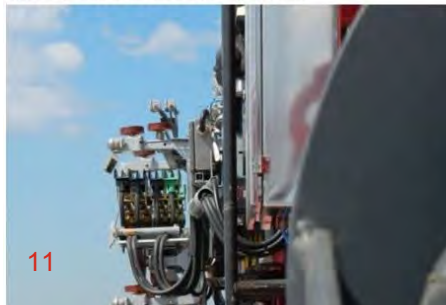
18 Mitsui RTG's. Electrification of RTG and installation and commissioning of pneumatic actuated automatic Drive-in units .Conductor bar system



Evyap Port, Turkey

Electrification of 10 RTG's, brand Kalmar

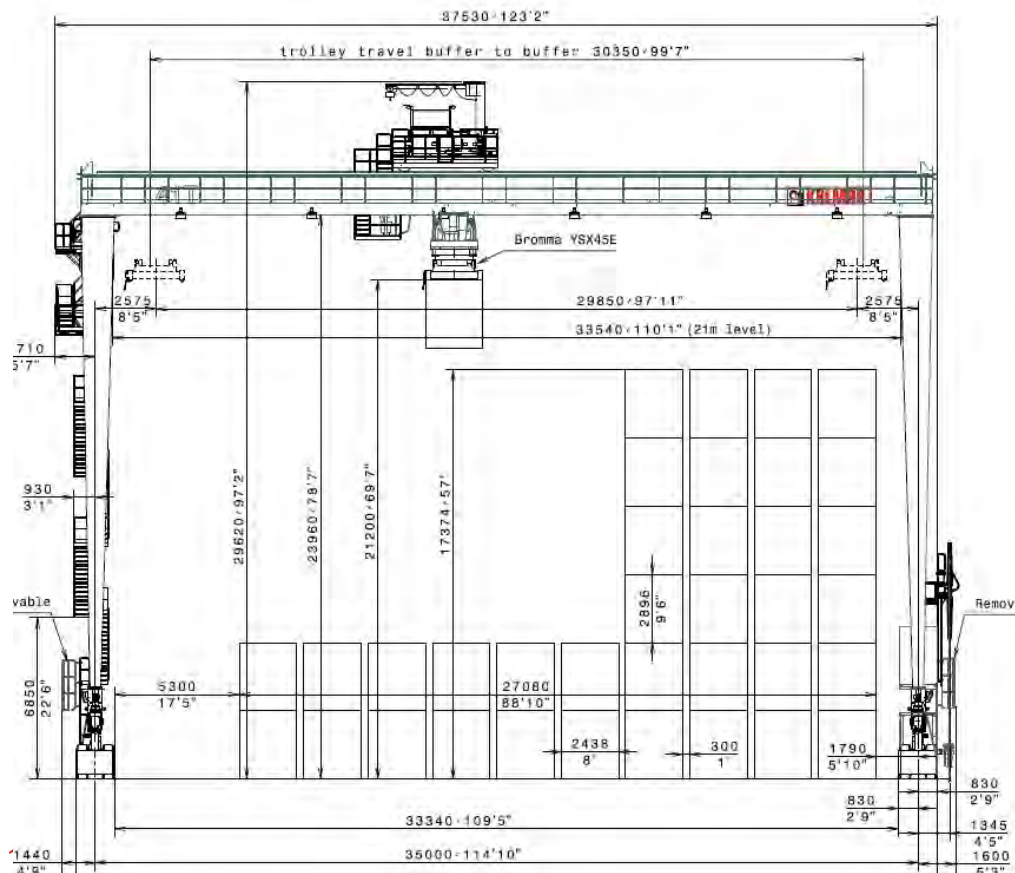
10 Kalmar RTG's (6x VSG): Electrification of RTG and installation and commissioning of pneumatic actuated automatic Drive-in units .Conductor bar system.



Wide span RTG

WIDE SPAN RTG

- 3+1
- 4+1
- 5+1
- 6+1
- 7+1
- 8+1
- 9+1
- 10+1



Up to 35m span !

27 May 2015

14



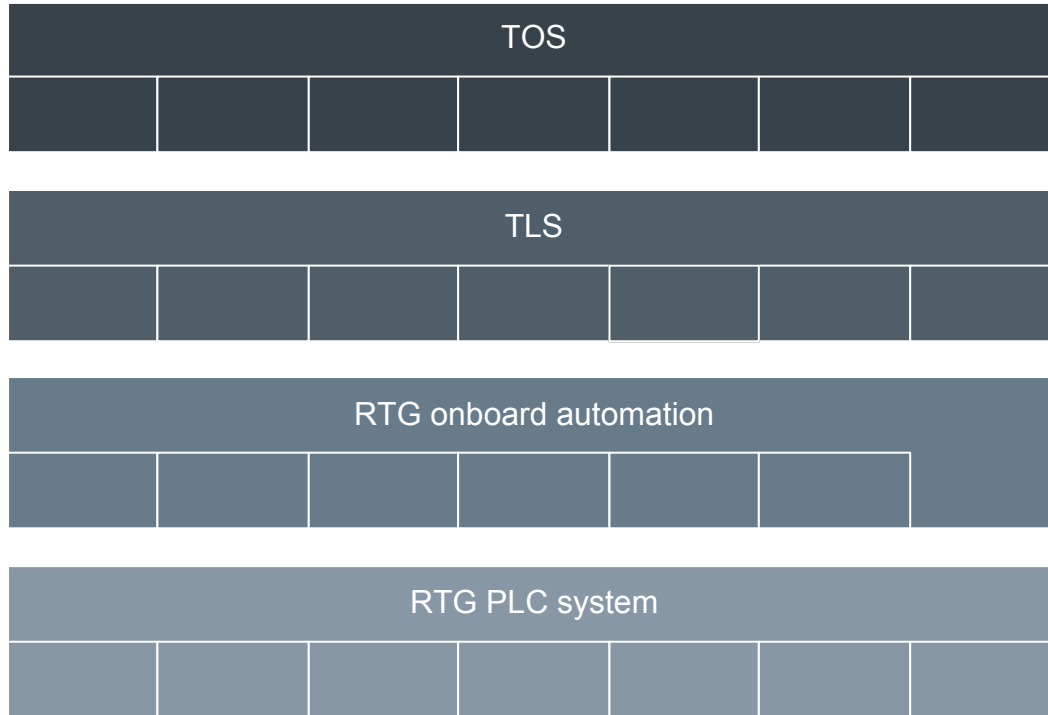
Kalmar AutoRTG

General overview

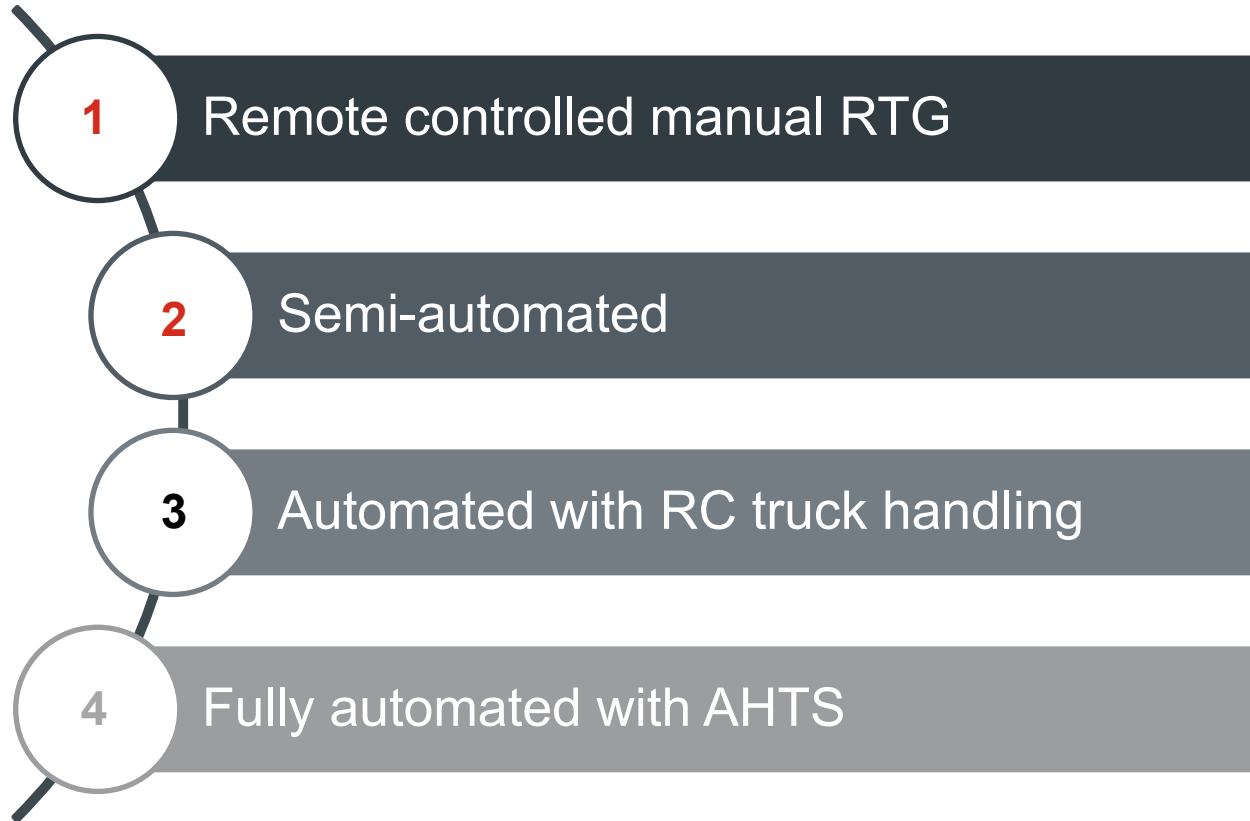
Truck lane safety



AutoRTG example system architecture



Step by step automation deployment approach

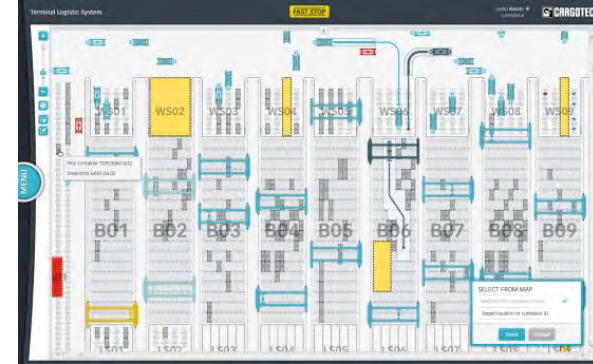




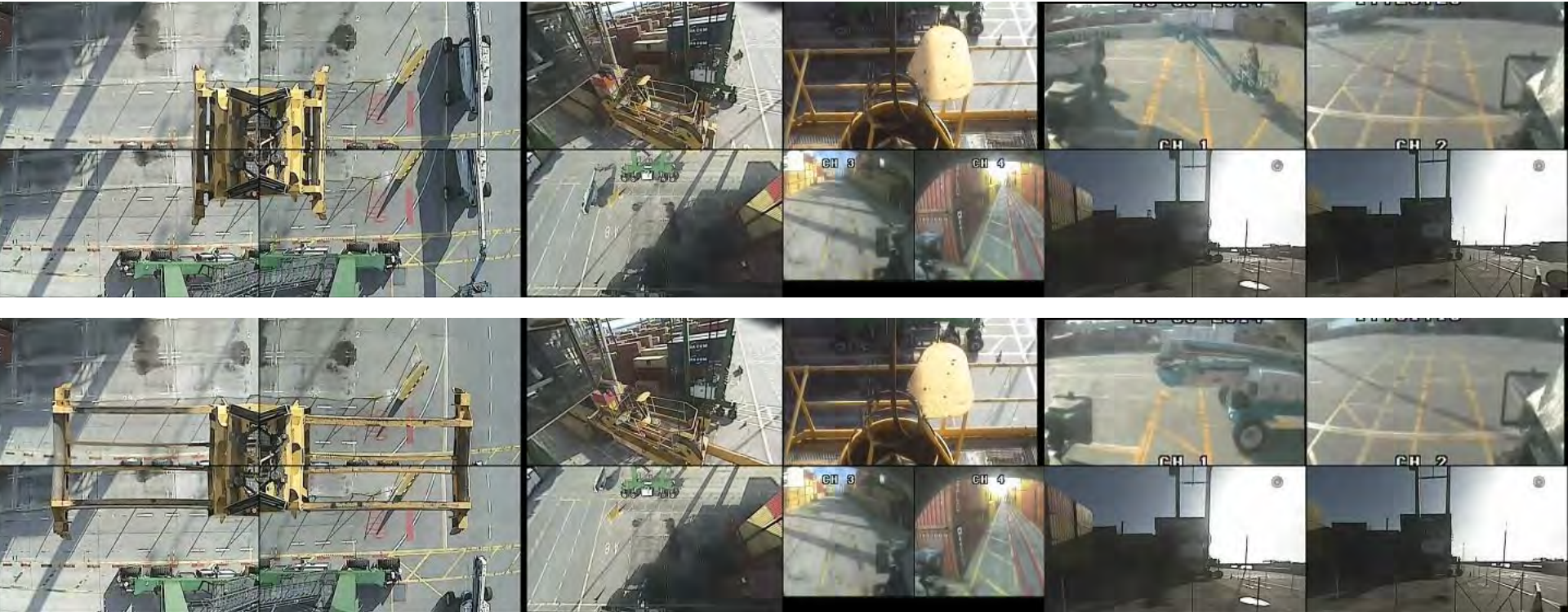
Kalmar AutoRTG

Remote Control

Kalmar remote control concept



Example RC Liveview video displays





Kalmar AutoRTG

References

Oslo Port Authority, Norway

Terminal setup:

- Brownfield
- RTGs and SCs
- 210,000 TEU, planned 450,000 TEU

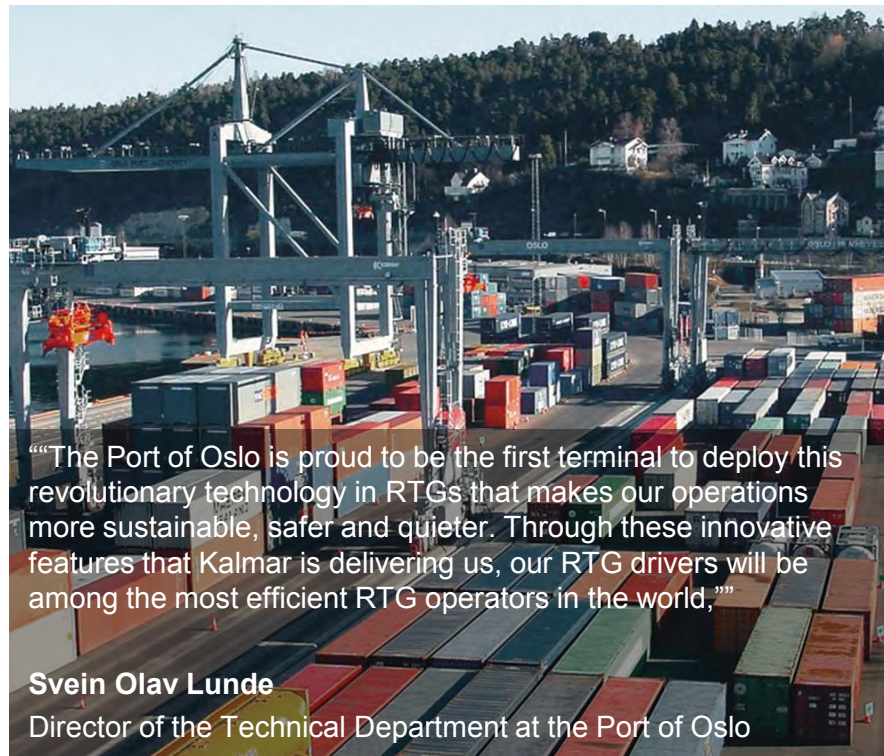
Equipment & software

- Kalmar RTGs with driver assisting semi-automation functions
- Laser based automatic gantry steering
- Automated gantry and trolley movements to the target location
- Driver executes pick and ground operations
- SmartProfile and anti-collision
- Onboard camera system
- Kalmar TLS for fleet management

Comment

As the Port of Oslo is located in a highly populated urban area there is a huge challenge in a plan to double the port's capacity by 2030 without increasing traffic noise, pollution and energy consumption.

With all-electric, space efficient Kalmar AutoRTGs with the sophisticated combination of automated positioning technology and process automation customer is able to fulfill these requirements.



EMEA Customer

Terminal setup:

- Brownfield
- RTGs and TTs
- 1,100,000 TEU, planned 1,700,000 TEU

Equipment & software

- Kalmar remote controlled AutoRTGs
- Kalmar remote control consoles
- DGPS based automatic gantry steering
- Remote operator executes RTG movements
- Onboard camera system
- Kalmar TLS for fleet management

Comment

Customer faces shortage of labor due to remote location of the port. By converting RTG operation to remote control one operator can control many RTGs. The target is to have one operator per 3 RTGs. Long term plan is to go gradually for full automation.



Turkey

TOYOTA

TOYOTA İSTİF MAKİNELERİ A.Ş.



EVYAPPORT

40° 46' 25" N 29° 42' 40" E



Making your every move count

