



Kalmar Crane Upgrades a way to extend port cranes life

Any crane, Any job, Anywhere.



Eduardo Prat, VP, Kalmar Crane Upgrades

Cargotec wants to become the leader in intelligent cargo handling

Strong global player with geographical diversification

Cargotec Group

Sales: EUR 3,514 million

EBIT: 7.1%

Services: 25%

Kalmar

Sales: EUR 1,700 million

EBIT: 8.0%

Services: 26%

Personal: 5.700

Hiab

Sales: EUR 1,036 million

EBIT: 13.5%

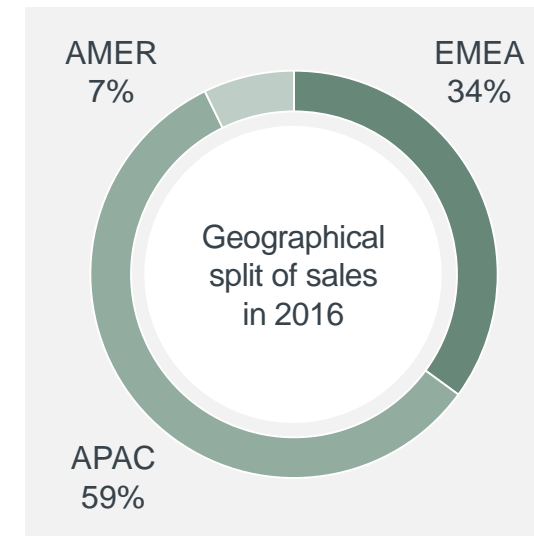
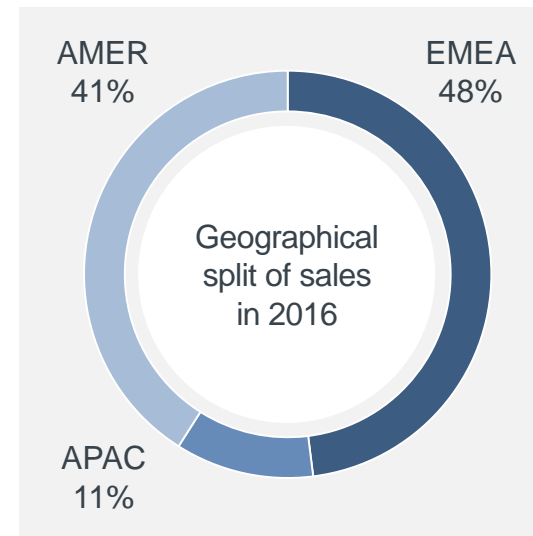
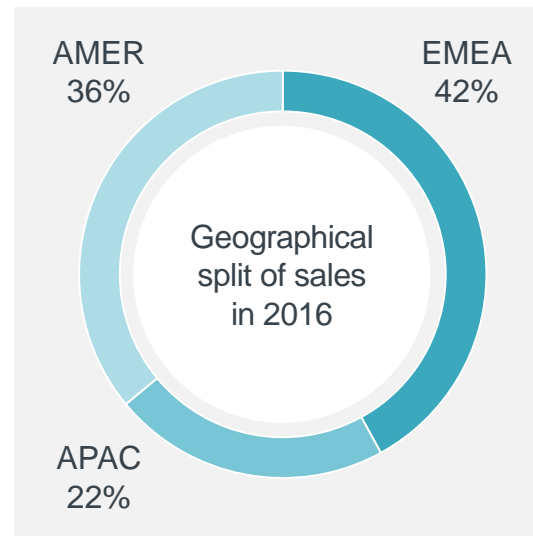
Services: 22%

MacGregor

Sales: EUR 778 million

EBIT: 2.3%

Services: 26%



Figures: 2016
EBIT % excluding restructuring costs



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

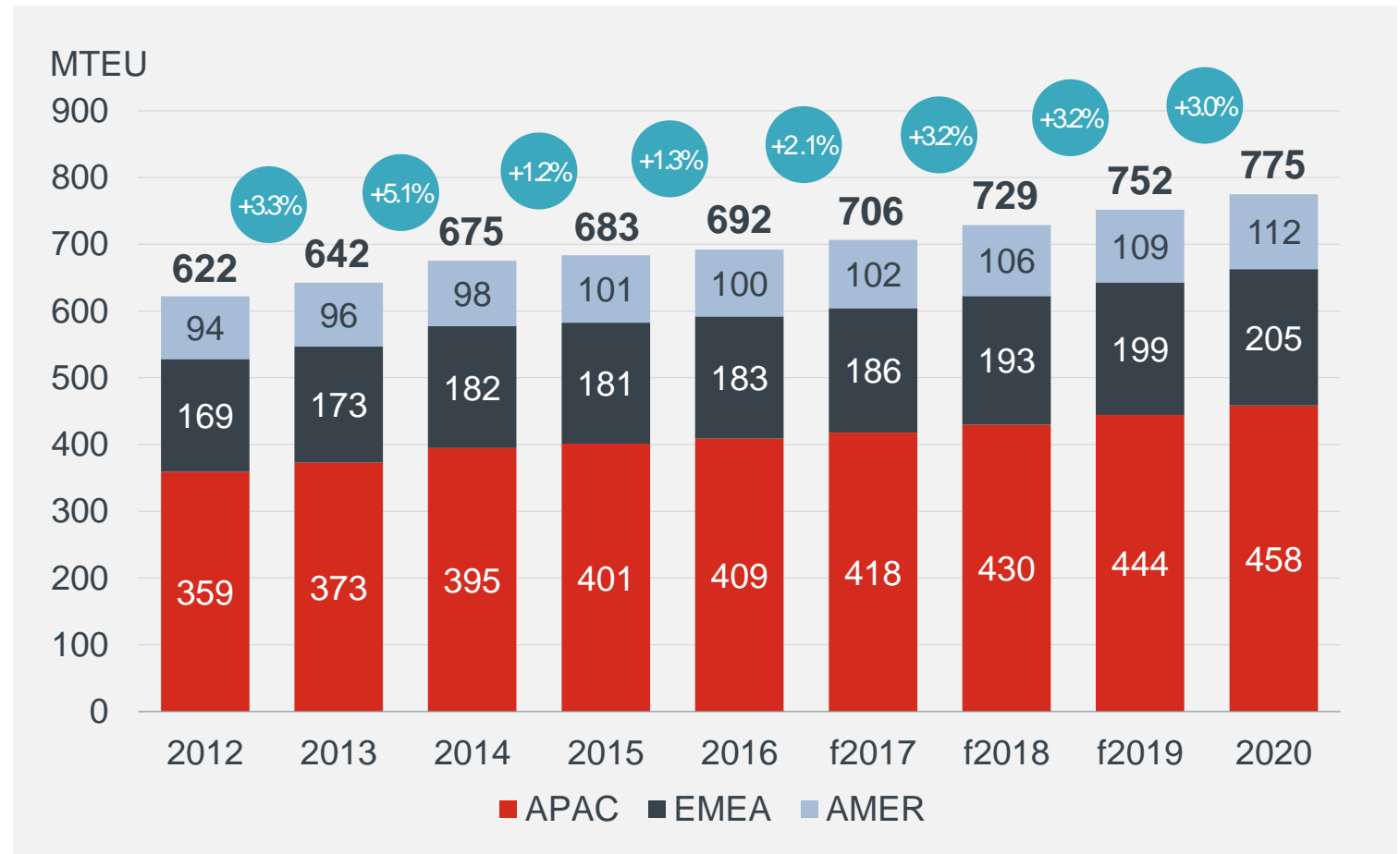
Industry trends

Market environment in 2016

Container throughput still forecasted to grow year on year.

Growth trend lower than in the previous decade (2-3% vs. 5-6%)

Growth from 2012 to 2020: **25%**
CAGR: **2,8%**



Source: 2013-2017: Drewry forecaster Q4 2016
F2018-F2020: Drewry forecaster Q3 2016

Mega trends



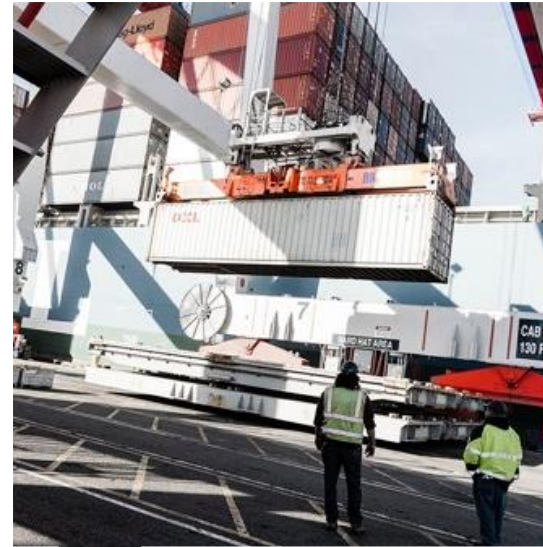
Mega vessels

Efficiency demands increase as marine transport continues to grow. Larger ships require capacity improvements from port operators.



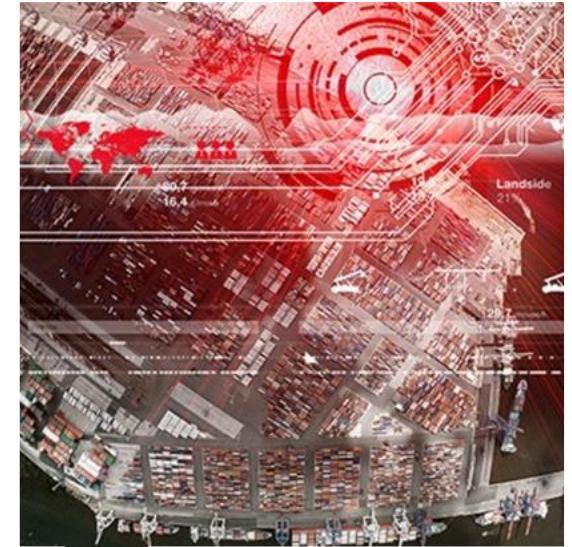
Sustainability

Strict emission requirements & growing concern for the environment increase the demand for more intelligent machines with smaller environmental impact.



Industry consolidation

New alliances between shipping lines are impacting container traffic flows and setting new efficiency standards for port operators.



Digitalisation & automation

Digital and automated solutions provide new possibilities for port operators to improve efficiency, safety and sustainability.

Our complete offering

Kalmar business area solutions



Automation



STS cranes



Reachstackers



Empty container handlers



Crane upgrades



Maintenance



Navis TOS



Bromma spreaders



ASCs & RTGs



Straddle & Shuttle carriers



Terminal tractors



Forklift trucks



Spare parts



Used equipment



XVELA collaboration platform



ALP and ALS

Automation &
Projects

Mobile
Equipment

Services

Navis
XVELA

Bromma

Full range of manual and automated equipment and technology



First automated
straddle carrier
2005

Over 100
SmartPort
deployments

Navis global
leader in Terminal
Operations
Systems

Global
automation
references

Technology and
Competence
Centre in
Tampere, Finland

End to end
solution
with Kalmar
OneTerminal

Crane Upgrades

What are Crane Upgrades?

- Crane Upgrades are sizeable projects that enhance the use and extend the life time of existing cranes.
- They are performed on large cranes capable of lifting containers or other heavy loads in yards or ship loading/unloading operations
- Typical products include STS cranes, RMG & RTG cranes, ASC cranes and straddle carriers
- Upgrades aim to improve either crane productivity, safety, physical dimensioning or physical operating location
- Our projects are based on over 80 years of experience and our key resources include engineering, project management and/or site management



Why upgrade?

Increasing container volumes

Challenge: increasing wear and tear for cranes

Solution: inspections, repair and refurbishment

Increasing terminal competition

Challenge: increasing demands on crane performance

Solution: consultancy and inspections, upgrades, modernisation and relocation

Increasing vessel sizes

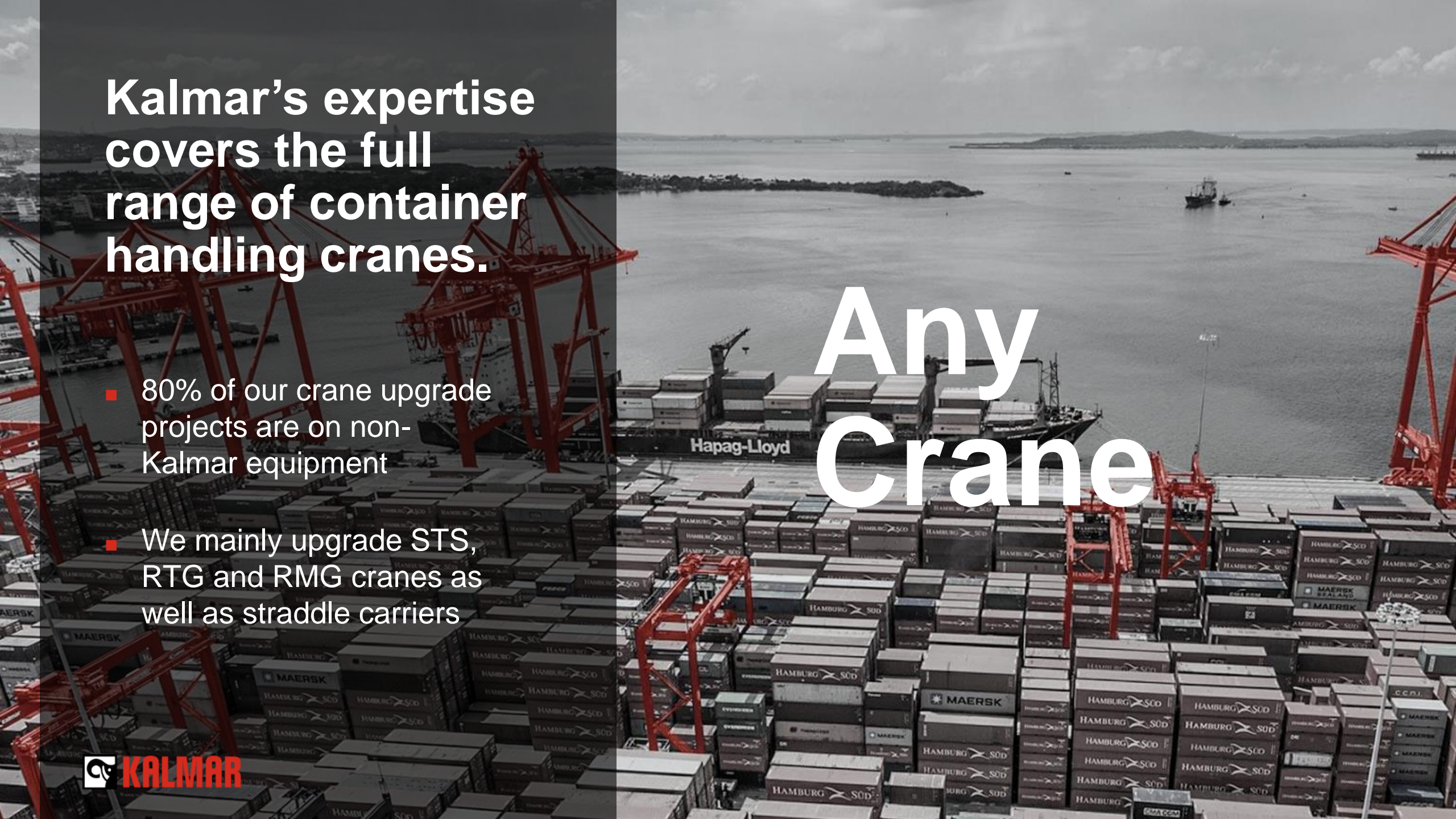
Challenge: technically competitive cranes become physically too small

Solution: consultancy and inspections, upgrades

Increasing need for sustainability

Challenge: being receptive to green values, with acceptable ROI

Solution: upgrades and modernisation

An aerial photograph of a busy port. In the foreground, there are numerous stacks of shipping containers, many with logos like 'HAMBURG SÖD' and 'MAERSK'. Several large red gantry cranes are positioned around the stacks. In the middle ground, a large container ship is docked at a pier, with 'Hapag-Lloyd' written on its side. The background shows a wide body of water and distant land under a cloudy sky.

Kalmar's expertise covers the full range of container handling cranes.

- 80% of our crane upgrade projects are on non-Kalmar equipment
- We mainly upgrade STS, RTG and RMG cranes as well as straddle carriers

**Any
Crane**

Any crane - examples



Hong Kong

Structural visual inspection of four non-Kalmar STS cranes



Port Klang, Malaysia

Refurbishment of 14 non-Kalmar straddle carriers



Yilport, Turkey

Electrification of 18 non-Kalmar RTGs

- Installation and commissioning of pneumatic actuated automatic drive-in units
- Conductor bar system



Marseille, France

Upgrade of three non-Kalmar STS cranes

- Gantry upgrade
- SPMT relocation
- Electrical modifications



Rotterdam, the Netherlands

Upgrade of 12 non-Kalmar STS cranes

- 8-metre height increase
- 4-metre boom extension
- Stacker platform
- Lifetime extension



Buenos Aires, Argentina

Boom extension and relocation of two non-Kalmar STS cranes

- 6-metre boom extension

References



TCB Barcelona – 2014 APM Group

Heightening 6 meters 3 ZPMC STS Cranes

- Total Control of the Project
- Execution the whole works on site - Safety is our priority



Port Said PSCCH – Egypt 2015

Boom Repair on a Noell STS Crane

- Complete Engineering Works
- Provide right Technical Solution
- Execution and Control of the Works
- Testing Protocol



Noatum Valencia 2015

Heightening 7 meters 2 Paceco STS Cranes

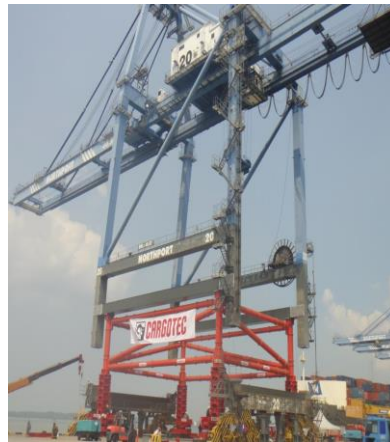
- Subcontractor of OEM (Paceco)
- Skidding the cranes and execution the whole works on site - Safety is our priority



MSCTV Valencia 2018

6 STS Crane Heightening and 8 STS Boom extension Works

- Manufacturing Control
- Relocate the cranes: Skidding and SPMT
- Crane Heightening and Boom Extension Works
- Testing Protocol
- Certification of the Cranes



Port Klang-2014 Northport Malaysia

Heightening 5 m. 8 Impsa STS's

- Complete Engineering
- Manufacturing Control
- Complete Electrical refurb.
- Own Jacking Device
- Execution and Control of the Works



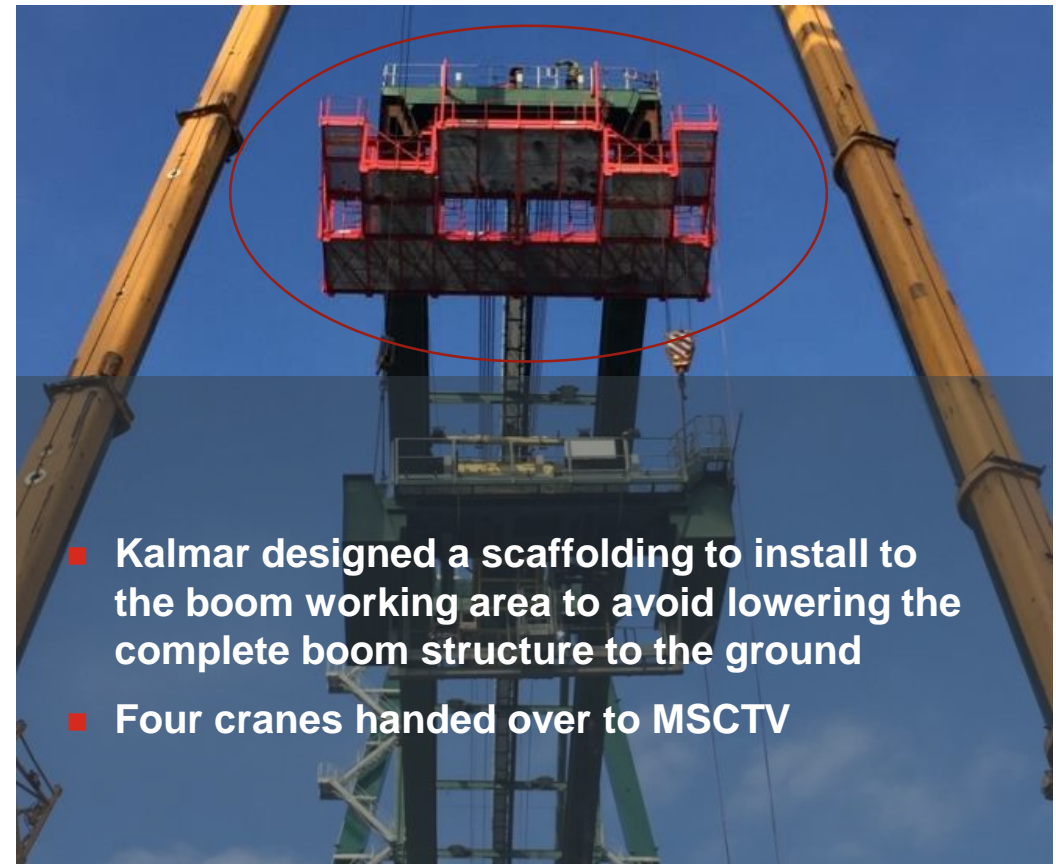
Abidjan – Ivory Coast 2015

Repair Kalmar STS Crane after accident

- Complete Engineering Works: Survey and repair proposal
- Provide right Technical Solution
- Manufacturing Control
- Execution and Control of the Works
- Testing Protocol

Heightening and boom extension, MSCTV Valencia

Heightening with 10 meters of 6 STS cranes and 6 meter boom extension of 8 STS cranes



A wide range of upgrade services for all brands of equipment

- Consultancy and inspection
- Repair and refurbishment
- Relocation
- Upgrade and modernisation
- Installation and commissioning of non-Kalmar new products

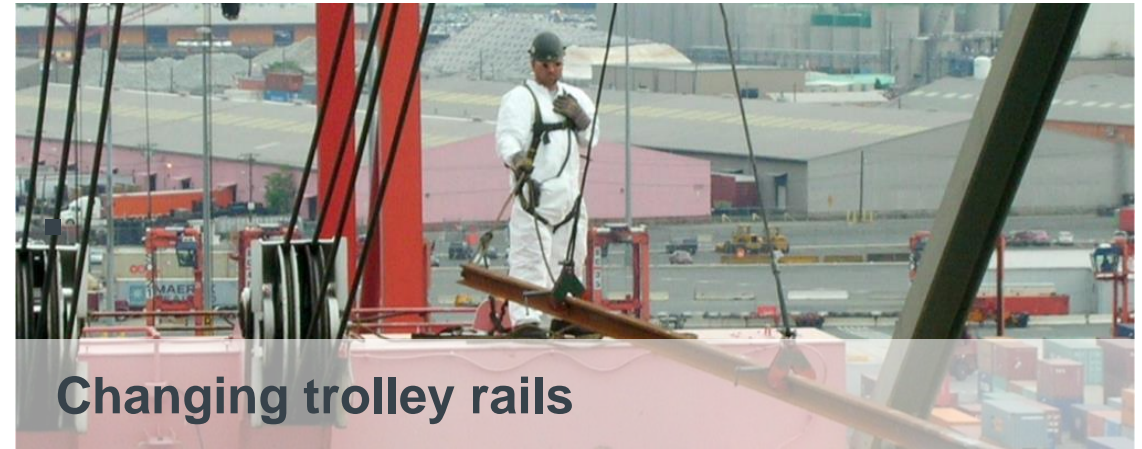
Any Job

Consultancy and inspection

- Damage survey
- Equipment modification study
- Lifetime analysis and inspection
- Lifetime extension plans
- Planning for crane upgrade project



Repair and refurbishment



Relocation

- Moving cranes to another location by land, river or sea
- An increasingly popular choice as terminals adapt to quickly changing needs and seek to optimise their investments



Relocation Transport by sea

- Sea transport relocation of an STS crane



Upgrade and modernisation

- Crane heightening and boom extension
- Modernisation of main components (control system, electric motors and cabin etc.)
- Safety additions (stacker platform, boom anti-collision and cameras etc.)
- Environmental and energy saving options (electrification of RTGs and fuel saving engine controllers etc.)
- Automation and operator assisting features (spreader soft landing etc.)



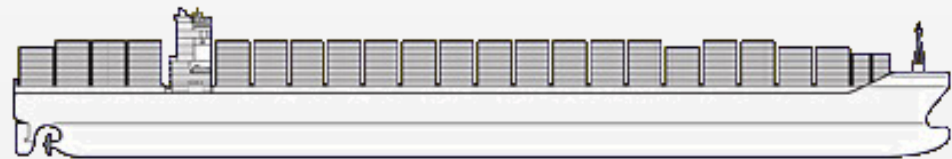
Upgrade and modernisation – growing ship sizes and volumes are met in most terminals



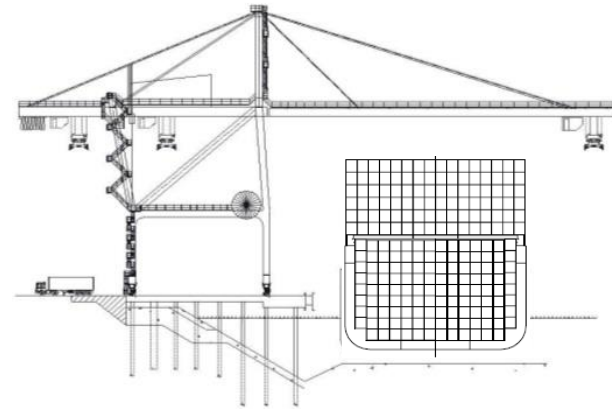
Panamax



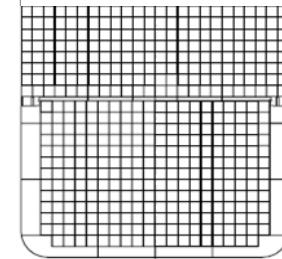
New Panamax



ULCV



STS-crane heightening and boom extension

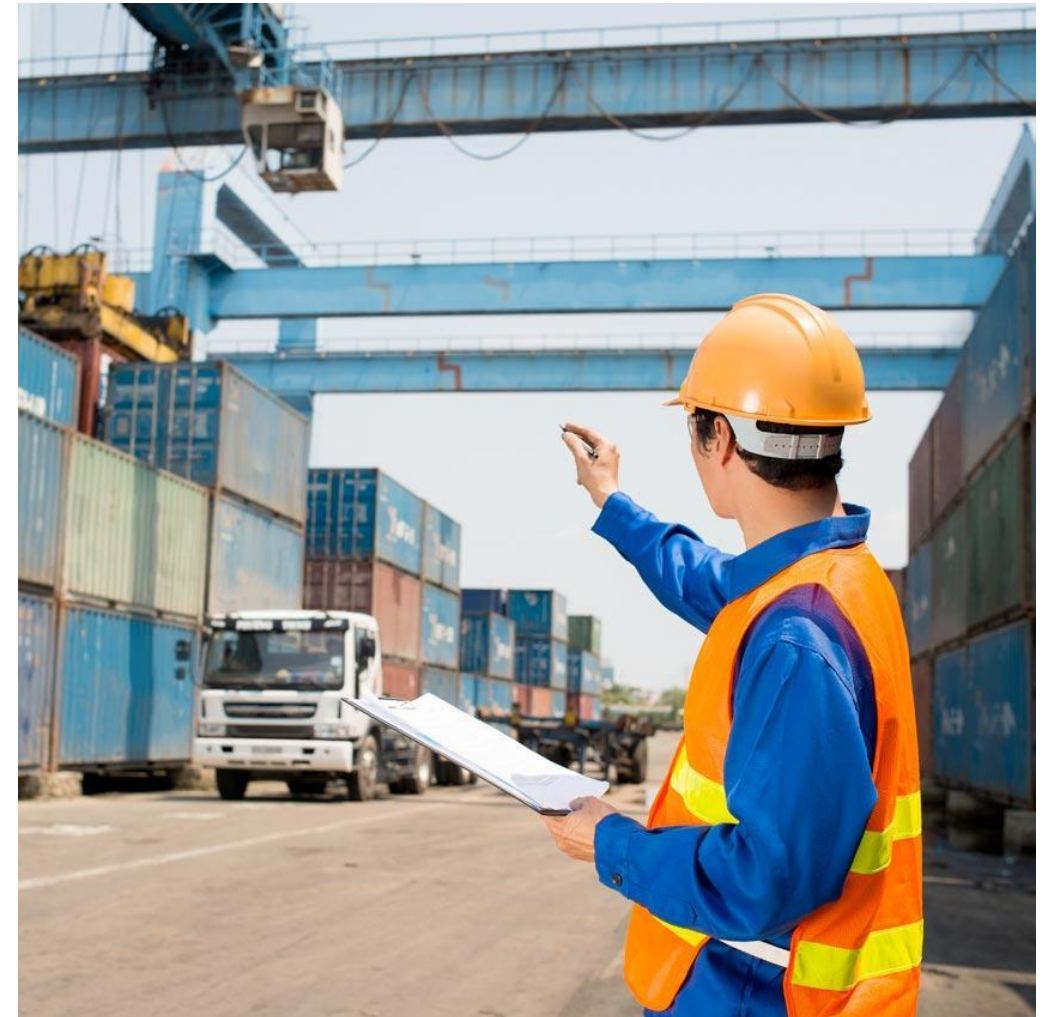


RTG-crane heightening



Upgrade and modernisation – budget and time indications

Budget indication (K€ / crane)	
STS boom extension	250 – 1,000
STS crane heightening	750 – 1,800
RTG heightening	75 – 200
Time from order to delivery (months)	
STS boom extension	6 – 12
STS crane heightening	6 – 12
RTG heightening	2 – 4
Crane out of operation (weeks)	
STS boom extension	6 – 10
STS crane heightening	6 – 10
RTG heightening	2 – 4



Upgrade and modernisation – two basic ways to electrify RTG cranes



Cable reel



Conductor bar system

Saving of about
35,000 litres of diesel
fuel per year / crane

Zero emissions,
no engine noise

Less maintenance –
increased availability

Upgrade and modernisation – a rapid return on investment

Savings

Diesel Electric RTG (3,000 hours per year)	Electrified RTG (3,000 hours per year)
18.0 litres/hour	40 kW/hour
1.25 €/litre	0.05 €/kWh
54,000 litre/year	120,000 kWh/year
67,500 €/year	6,000 €/year
Approximate savings per RTG per year: € 60,000 = US\$ 75,000	

ROI expectation: 2 - 4 years (depending on the scope and fuel price)

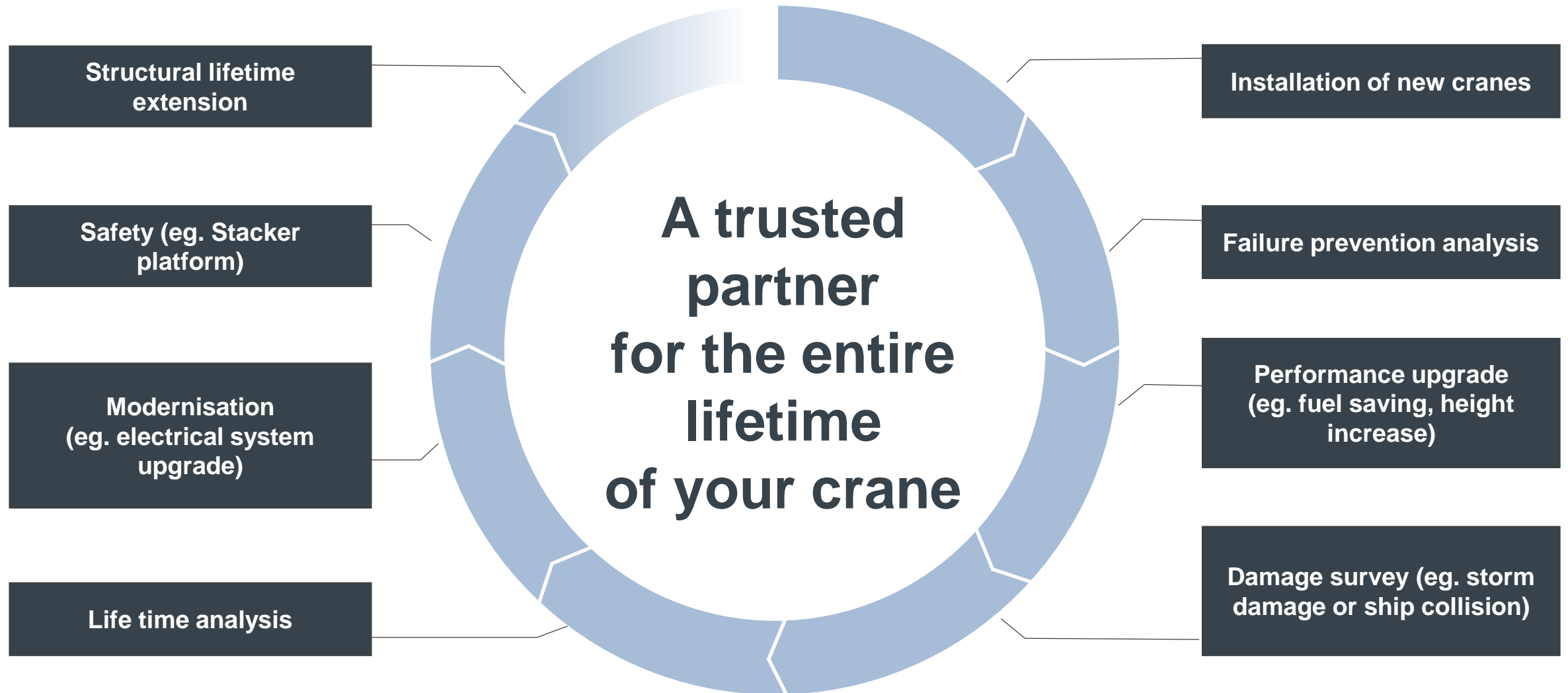
Variables: Total container block length; conductor bar structure or cable length / Local price level for labor and hardware structures / Single or double sided connection (conductor bar) / Filtering of electric power / RTG voltage transformation / various other minor technical challenges.

Installation and commissioning of non-Kalmar products

- Installation and commissioning of new STS cranes
- Same team to handle bunch-list and warranty work effectively



Any job

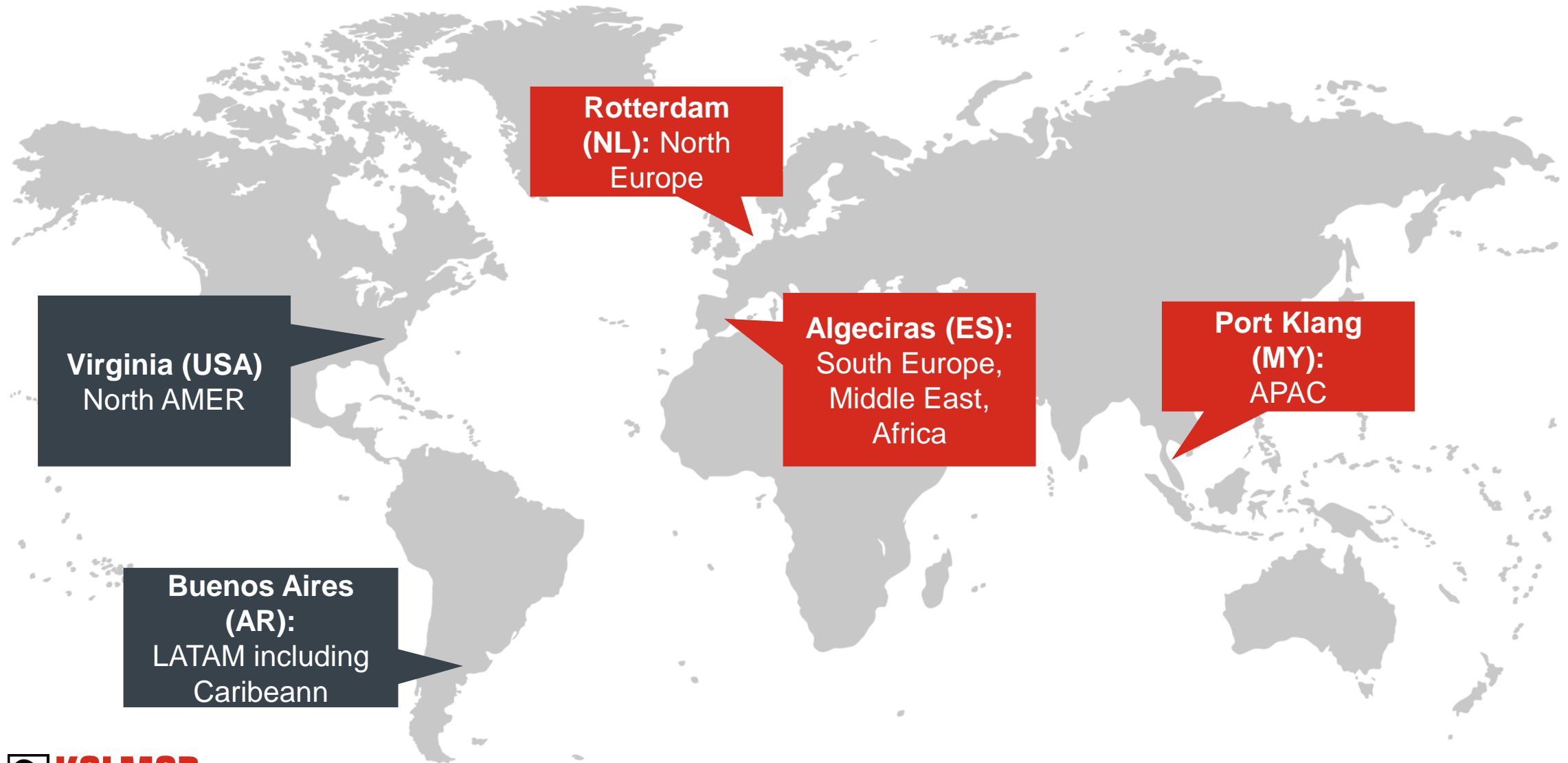


Kalmar's global reach means that we can undertake crane upgrade projects in every corner of the world.

- 5 Regional Business Centres world wide
- Personnel in 33 countries and sales and service in 100 countries
- 5,300 Kalmar professionals at your service

Anywhere

Five regional business centres that cover the world



Virginia (USA)
North AMER

Buenos Aires (AR):
LATAM including
Caribean

Rotterdam (NL): North
Europe

Algeciras (ES):
South Europe,
Middle East,
Africa

Port Klang (MY):
APAC

Summary

Why upgrade?

- Maximise the use of your current assets
- Handle bigger vessels/volumes
- Optimise crane performance
- Meet your sustainability targets
- Improve safety

Why choose Kalmar?

- A trusted partner with a solid track record and service mind-set
- We are a STS/RTG/RMG OEM
- Own Engineering/Equipment





KALMAR

Kalmar Global Crane Services Projects
Maximizing port side productivity



Making your every move count.