



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%

Hiab

Sales: EUR 1,036 million

EBIT: 13.5%

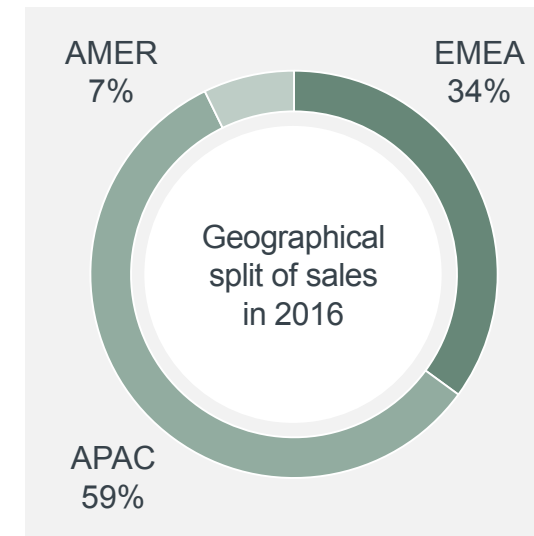
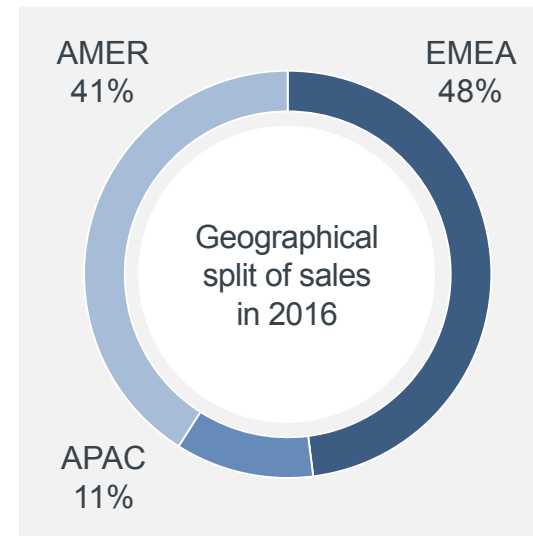
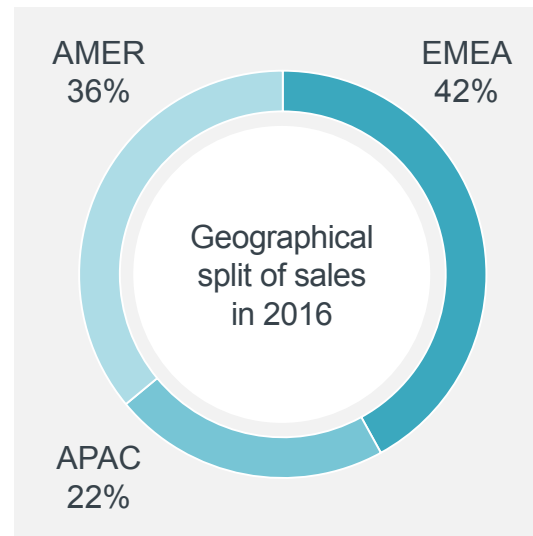
Services: 22%

MacGregor

Sales: EUR 778 million

EBIT: 2.3%

Services: 26%



Figures: 2016
EBIT % excluding restructuring costs

**A global reach with personnel in 30 countries
and sales and service in more than 100 countries.**





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

Kalmar's operating environment



Provides integrated port automation solutions including software, services and a wide range of cargo handling equipment



TOS coordinates and optimises the planning and management of container and equipment moves in complex business environments.

Navis provides also maritime shipping solutions:

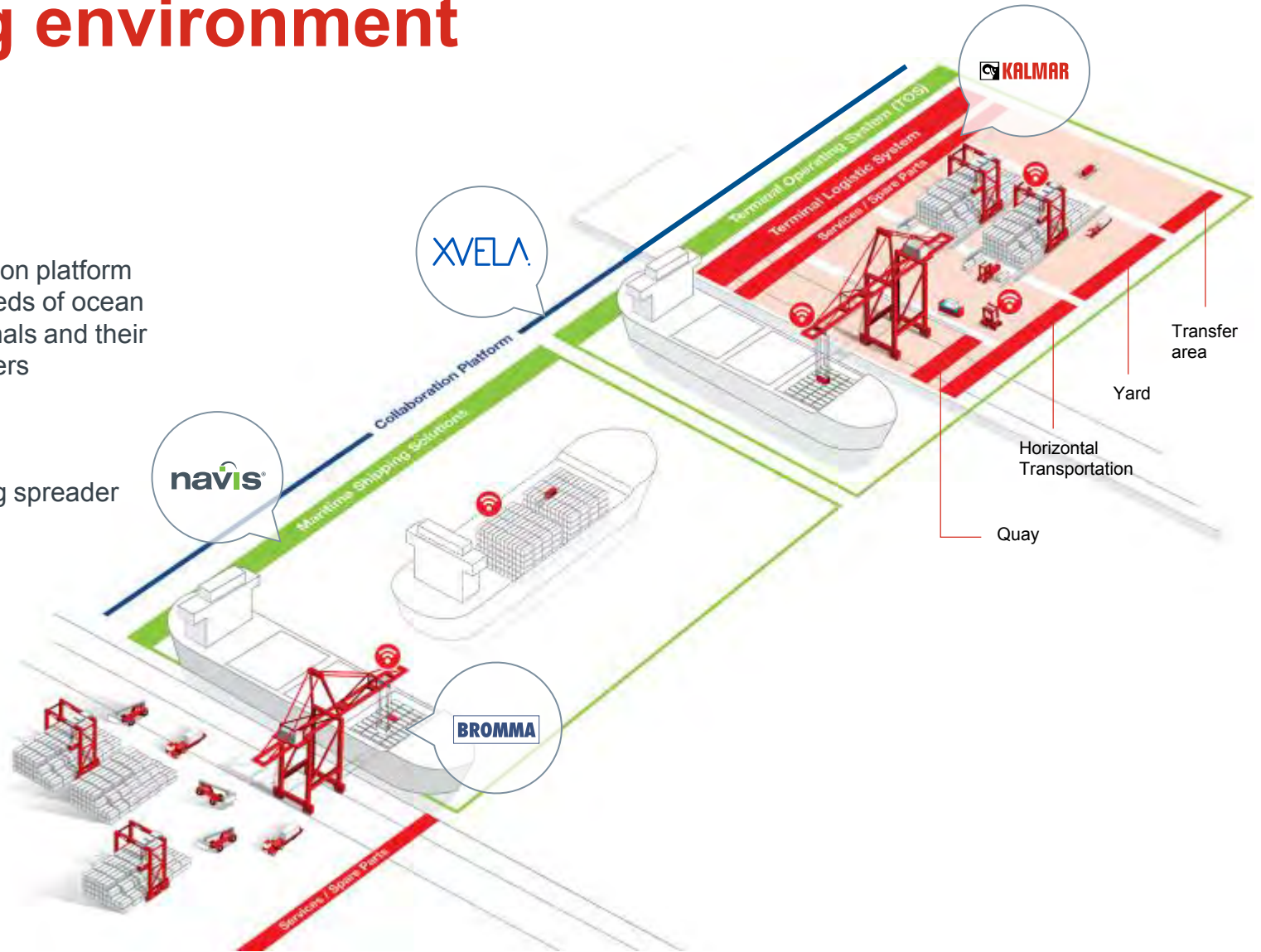
- Stowage planning
- Vessel monitoring
- Loading computer
- Route planning



The collaboration platform serving the needs of ocean carriers, terminals and their shipping partners



Industry leading spreader manufacturer



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

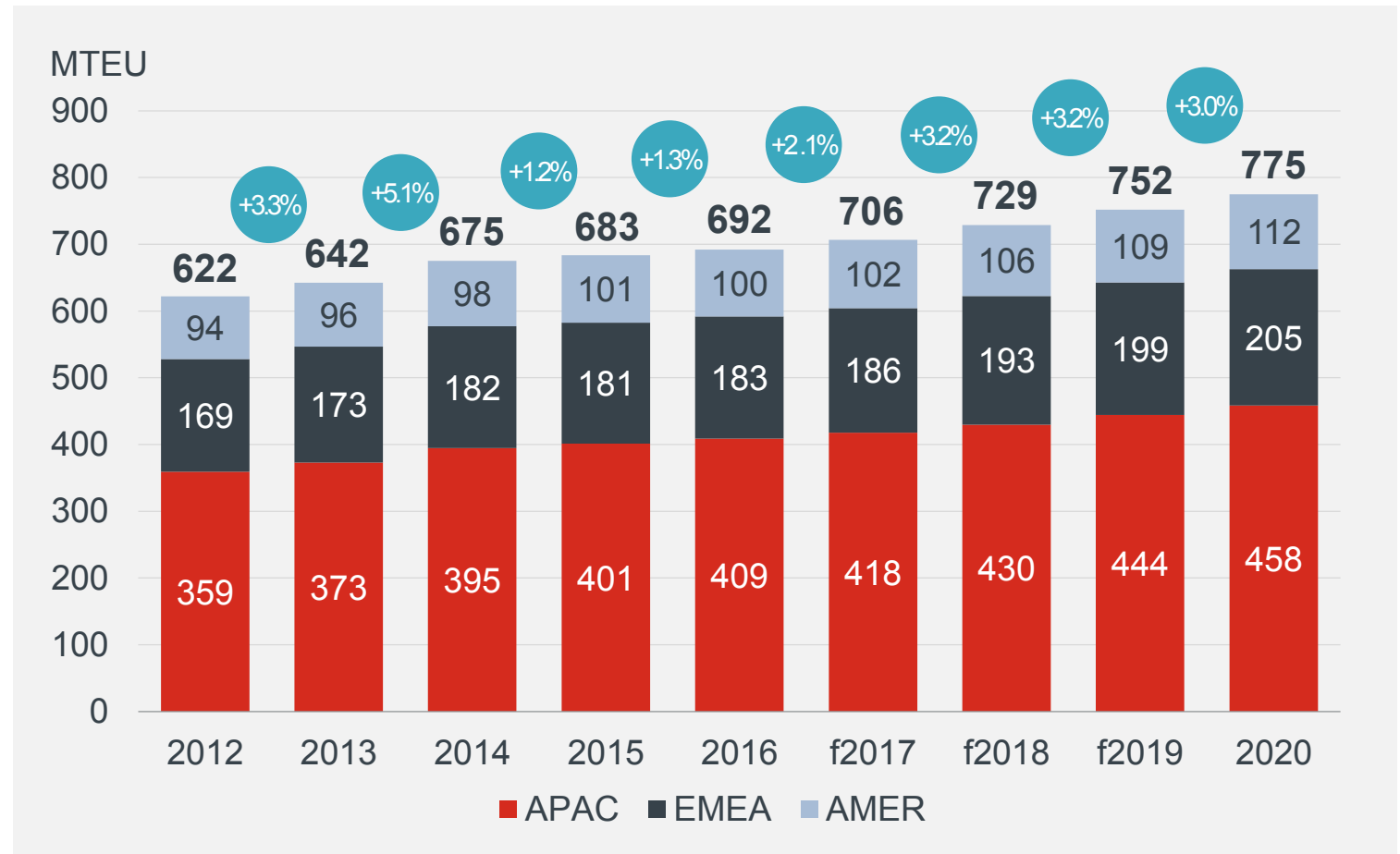
Industry trends

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.



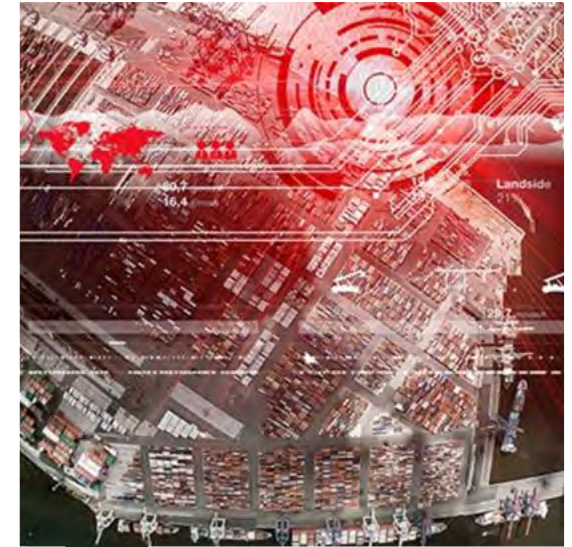
Sustainability

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.

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, 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



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

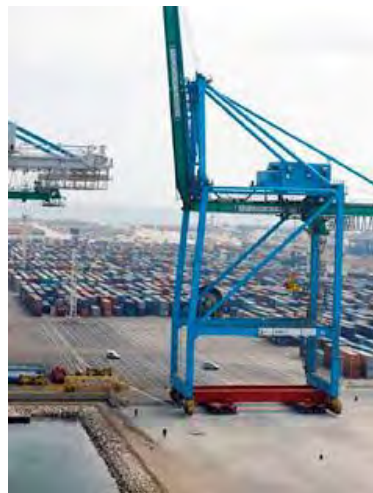
Refurbishment of 14 non-Kalmar straddle carriers



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 – 2014/1. 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 15

Boom Repair on a Noell STS Crane

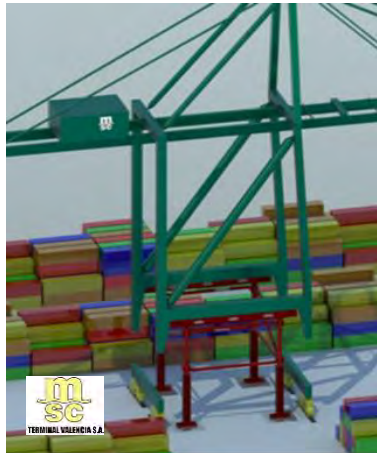
- Complete Engineering Works
- Provide right Technical Solution
- Execution and Control of the Works
- Testing Protocol



Paceco Valencia 15

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 – In execution

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 Said SCCT – Egypt

Securing crane after vessel collision

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



Abidjan – Ivory Coas t15

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

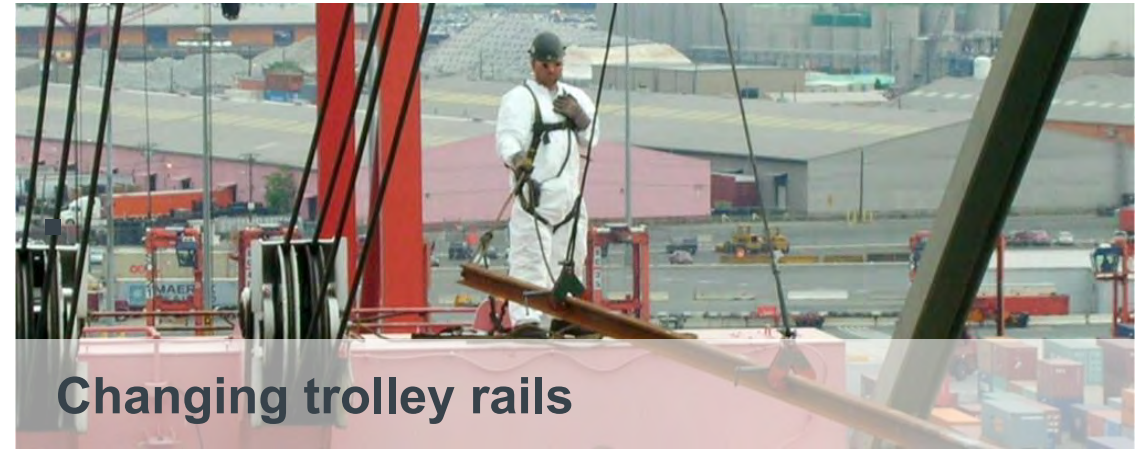


A wide range of upgrade services for all brands of equipment

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

Any Job

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

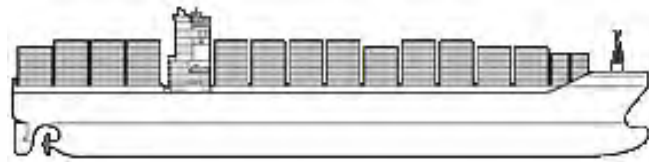


Relocation Transport by sea

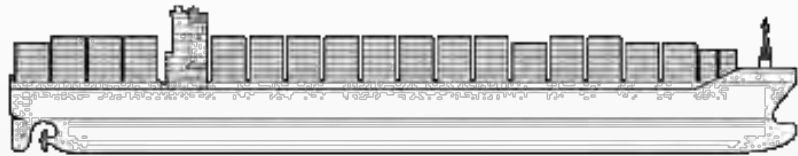
- Sea transport relocation of an STS crane



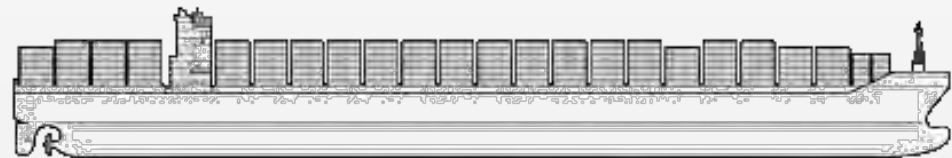
Upgrade and modernisation – growing ship sizes and volumes are met in most terminals



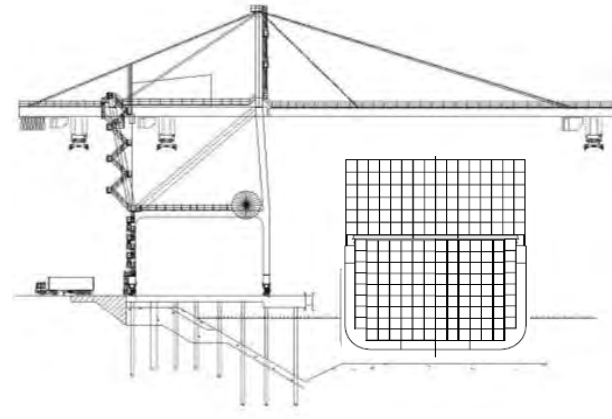
Panamax



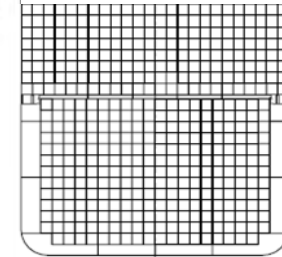
New Panamax



ULCV



STS-crane heightening and boom extension



RTG-crane heightening



Upgrade and modernisation

- 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.)

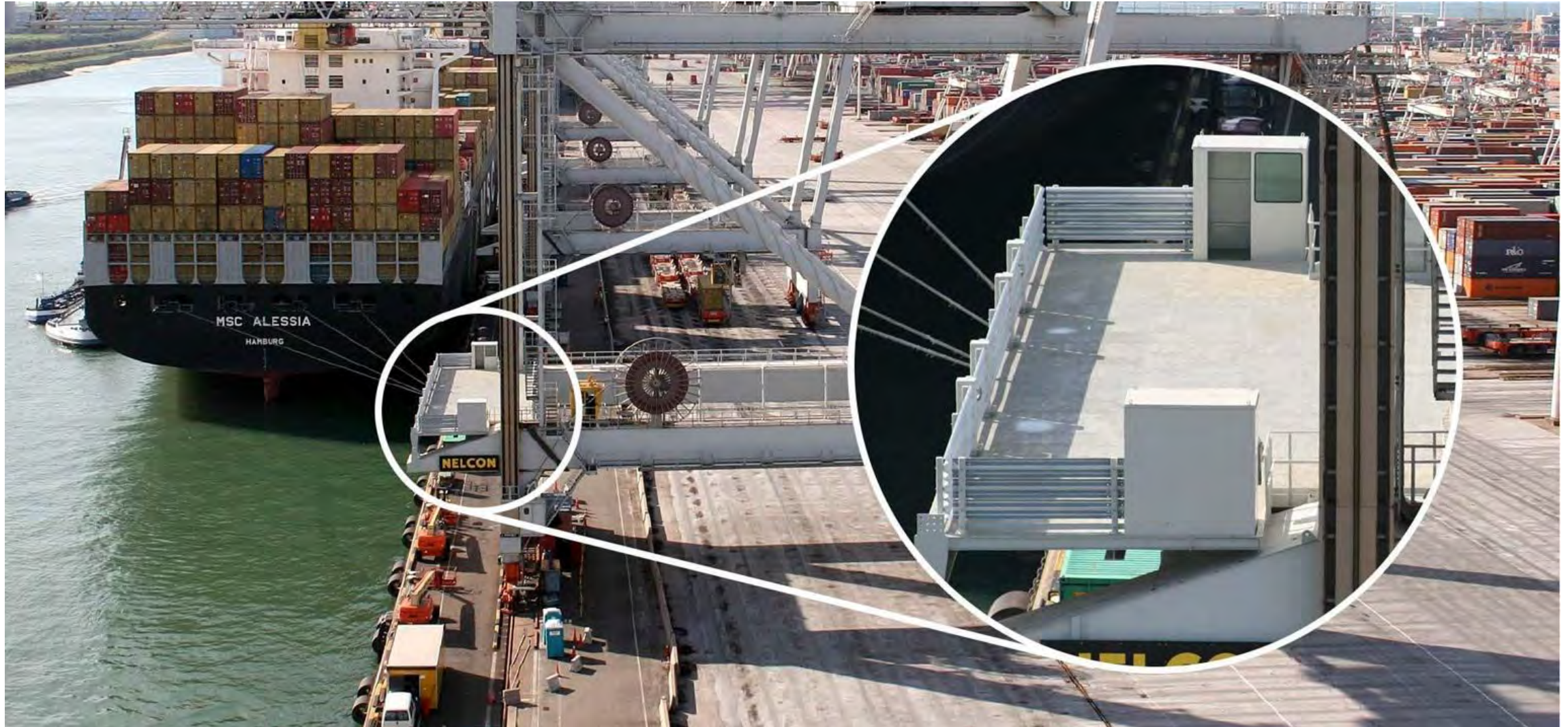


Upgrade and modernisation – budget and time indications

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

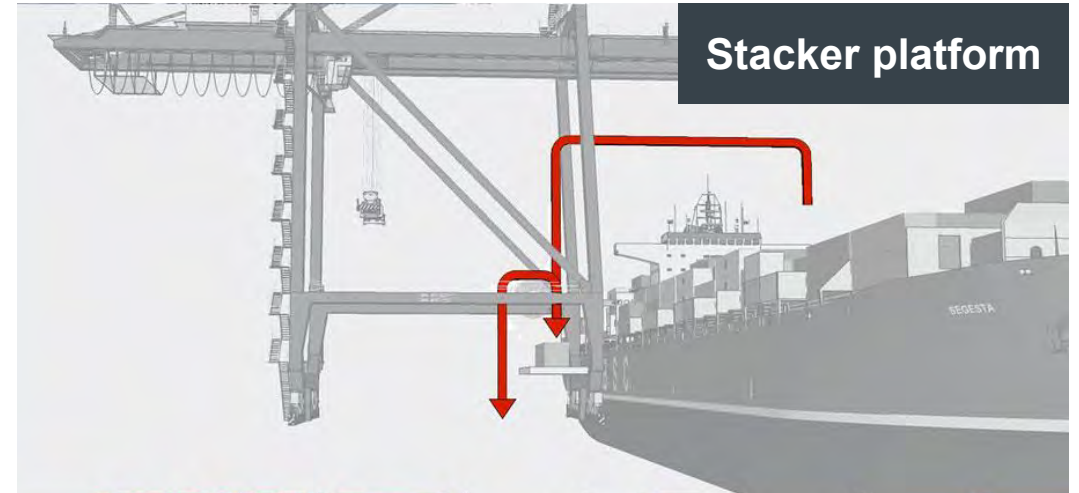


Upgrade and modernisation – stacker platform



Upgrade and modernisation – benefits of a stacker platform

- People work in a dedicated area with safety bars
- The restricted platform helps people focus on their work
- Containers are lowered and stabilised on the platform with guiding bars, while taking the twistlocks in or out
- Easy future automation due to standardised cradle
- Possible shortening of handling-time



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)

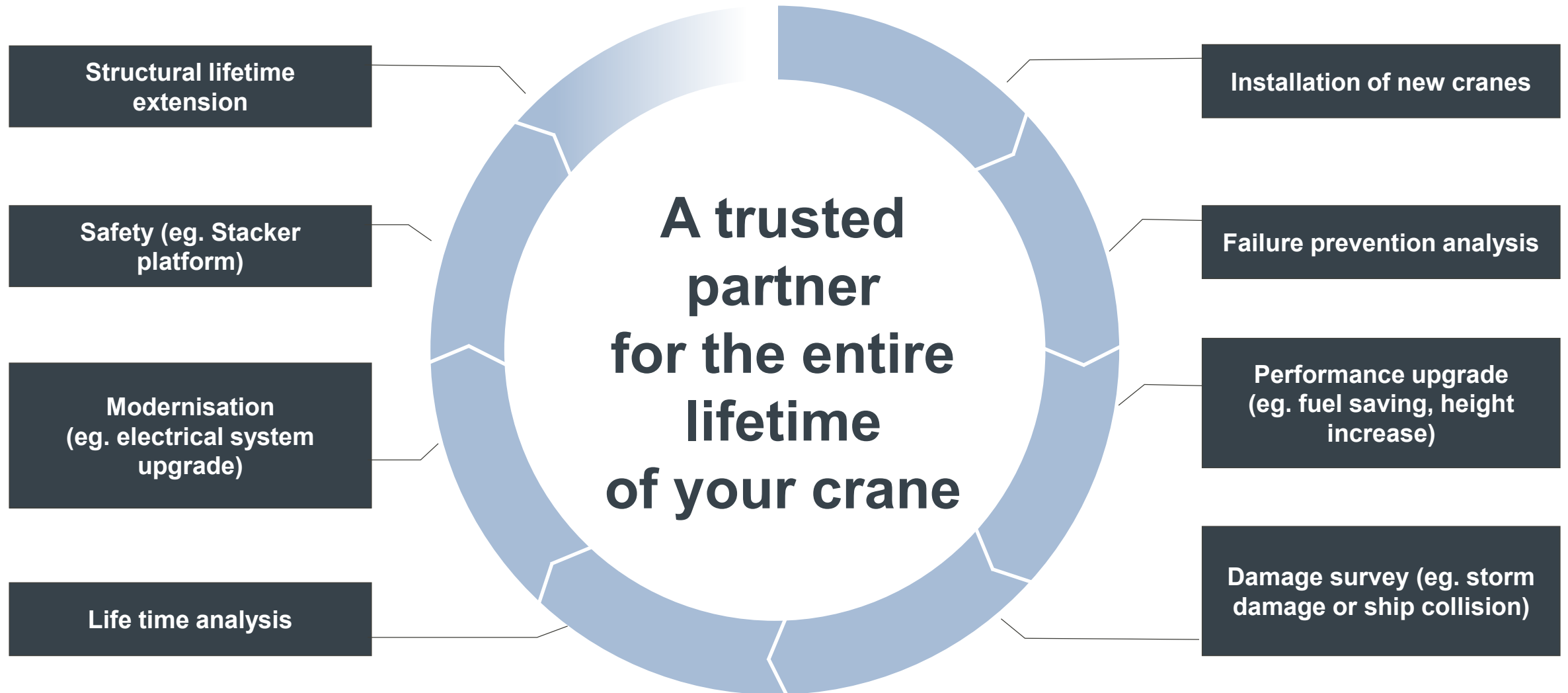
Variables: Total container block length; conductor bar structure or cable length / Local price level for labor and hardware structures / Single or double sided connection (conductor bar) / Filtering of electric power / RTG voltage transformation / various other minor technical challenges.


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



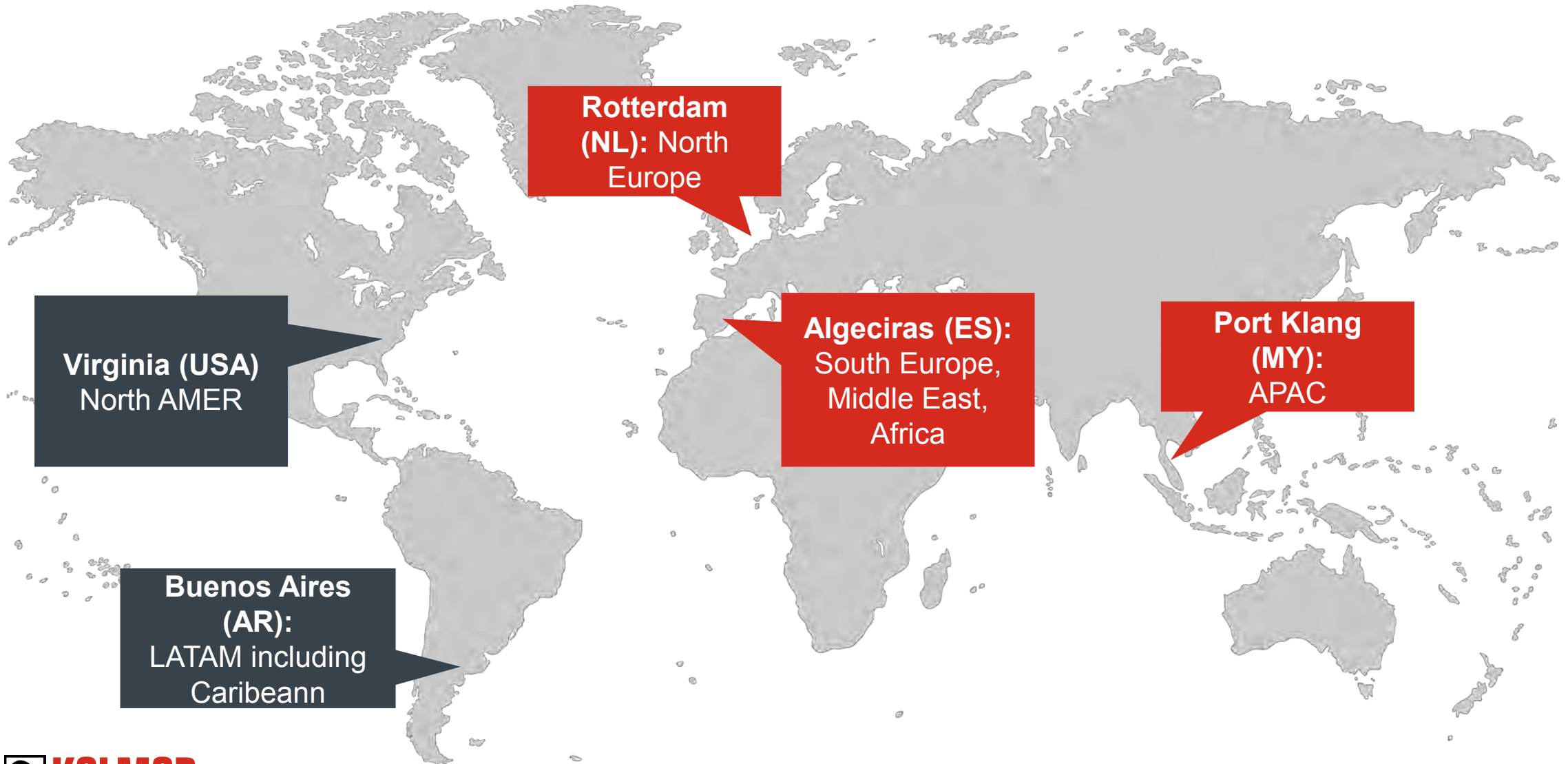


Kalmar's global reach means that we can undertake crane upgrade projects in every corner of the world.

- 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



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 OEM
- Own Engineering/Equipment





Making your every move count.