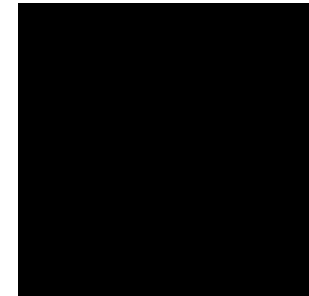


Crane Upgrades a way to extend port cranes life



Eduardo Prat - Vice President EMEA South

15th Intermodal Africa 2016
6-8 April, Accra



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Anywhere**

Contents

- What are crane upgrades?
- Why to upgrade?
- Examples of crane upgrade projects
- Conclusions

What are crane upgrades?



- Crane Upgrades are sizeable projects that enhance the use existing of 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

Examples of crane upgrades projects



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

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Examples of crane upgrades projects



TCB Barcelona – 2014/15
 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 Valencia15
 Heightening 7 meters 2 Paccoco 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 – In execution
 Securing crane after vessel collision

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

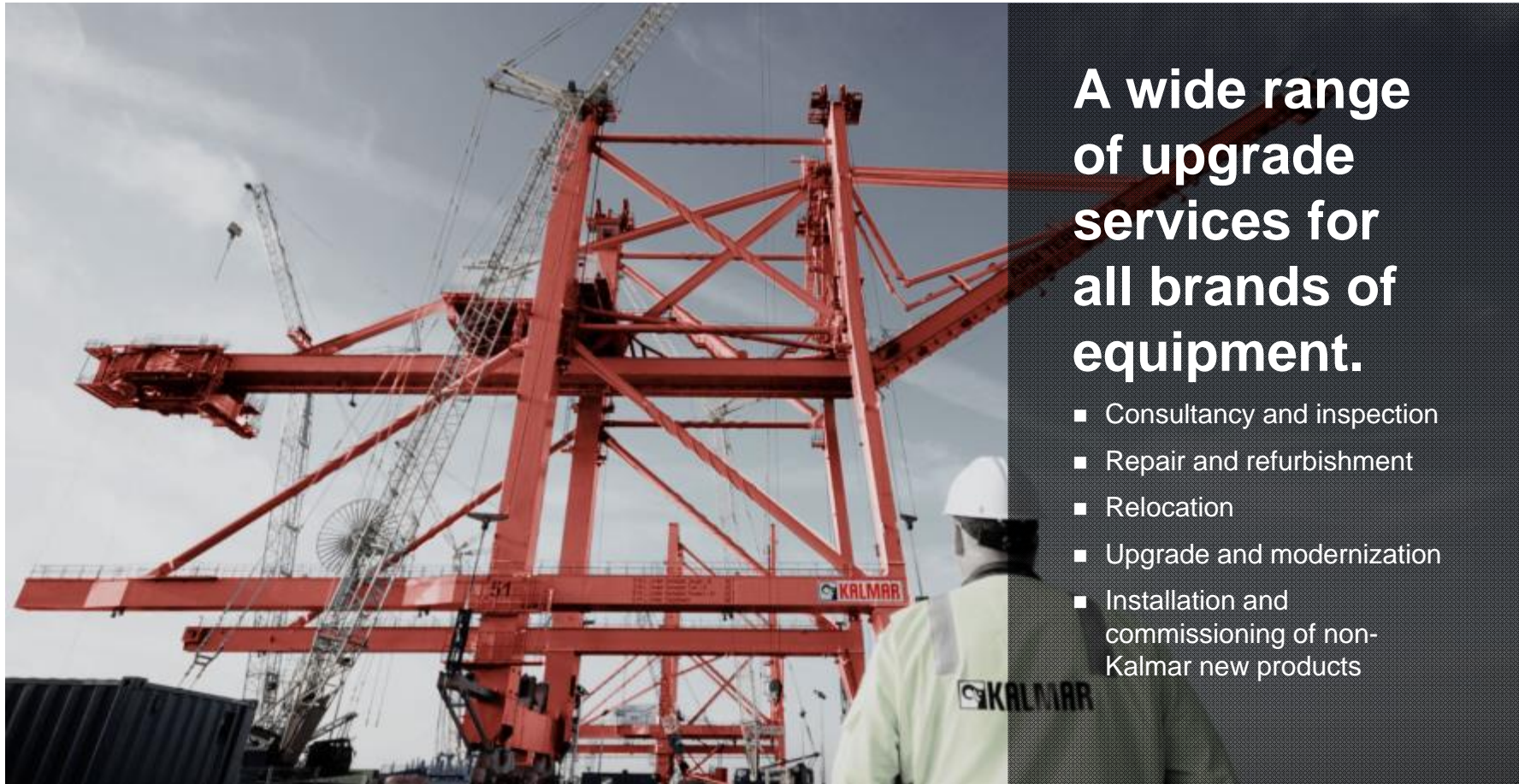


Abidjan – Ivory Coast15
 Repair Kalmar STS Crane after accident

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

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A wide range of upgrade services for all brands of equipment.

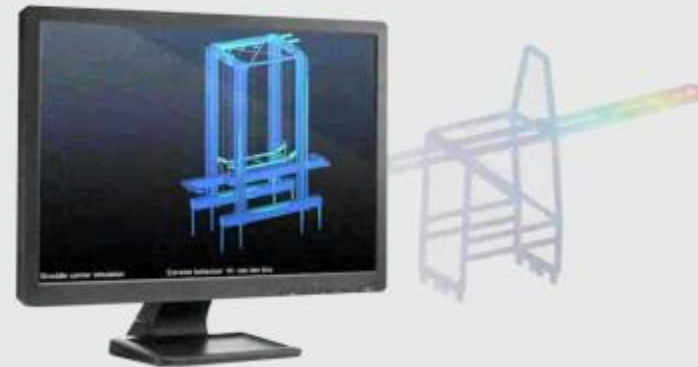
- Consultancy and inspection
- Repair and refurbishment
- Relocation
- Upgrade and modernization
- Installation and commissioning of non-Kalmar new products

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Consultancy and inspection

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



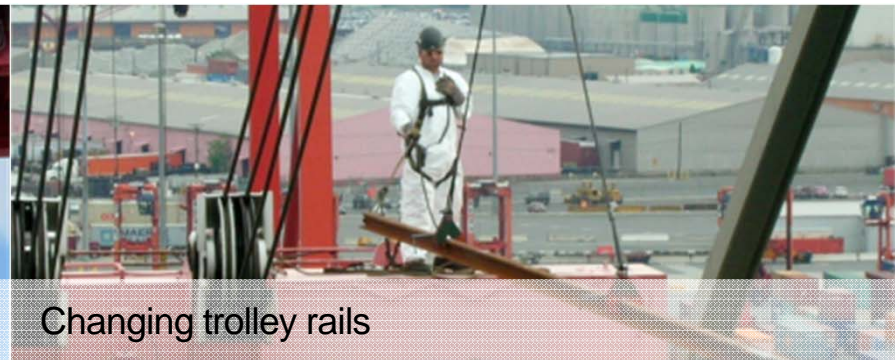
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Repair and refurbishment



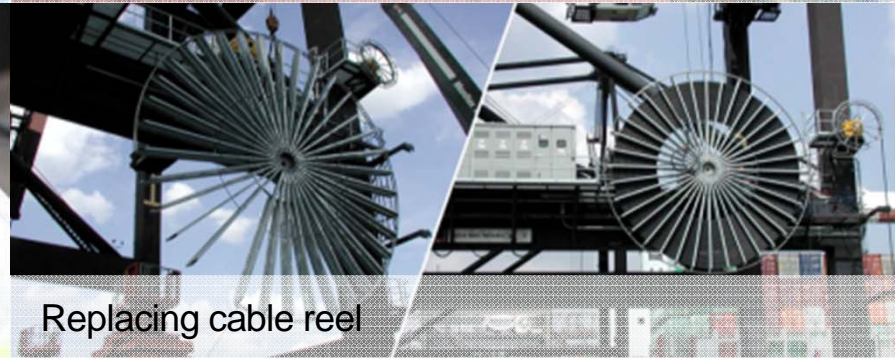
Festoon installation



Changing trolley rails



Crane control system and/or motors



Replacing cable reel

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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

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Relocation – within a terminal



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Relocation – transport by sea



Sea transport relocation of STS crane with rail gauge modification for new terminal



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Upgrade and modernisation

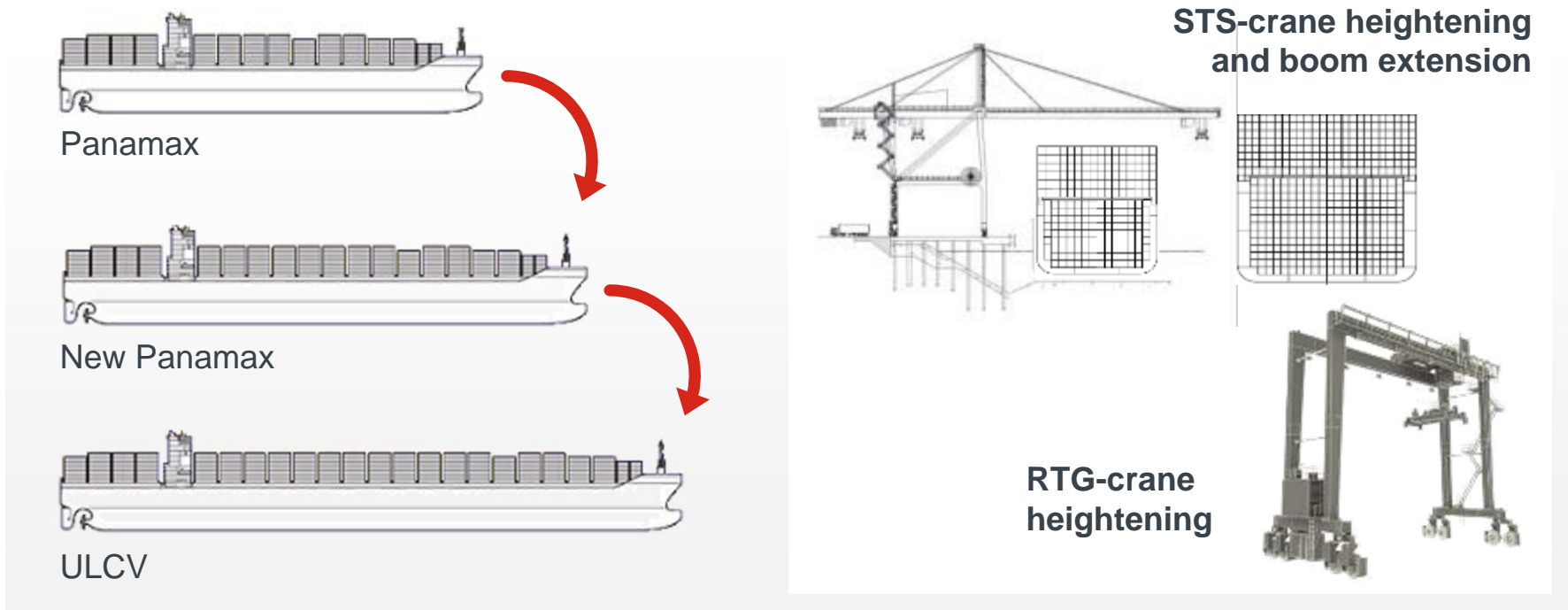
- Crane heightening and boom extension
- Modernisation of main components (control system, electric motors and cabin etc.)
- Safety additions (stacker platform, boom anti-collision and cameras etc.)
- Environmental and energy saving options (electrification of RTGs and fuel saving engine controllers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



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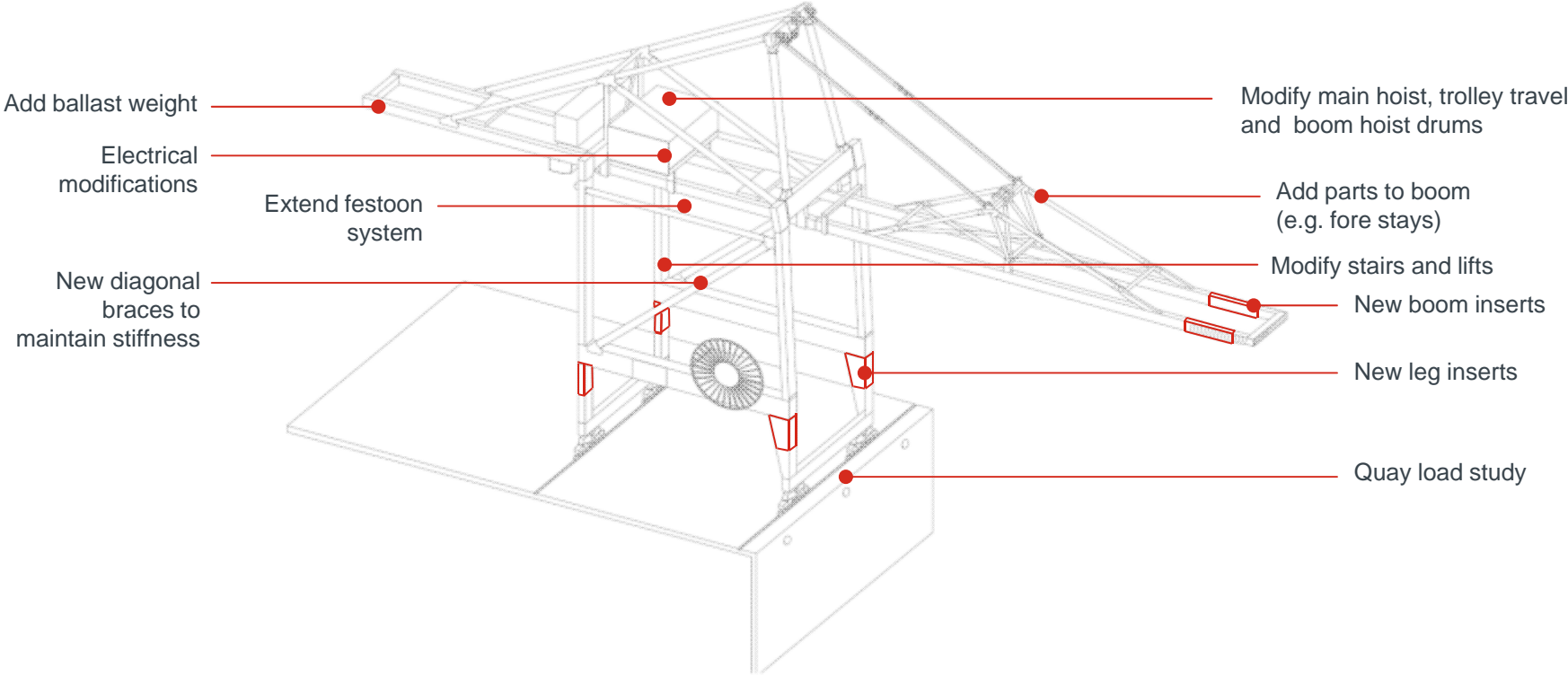
Upgrade and modernisation – growing ship sizes and volumes are met in most terminals



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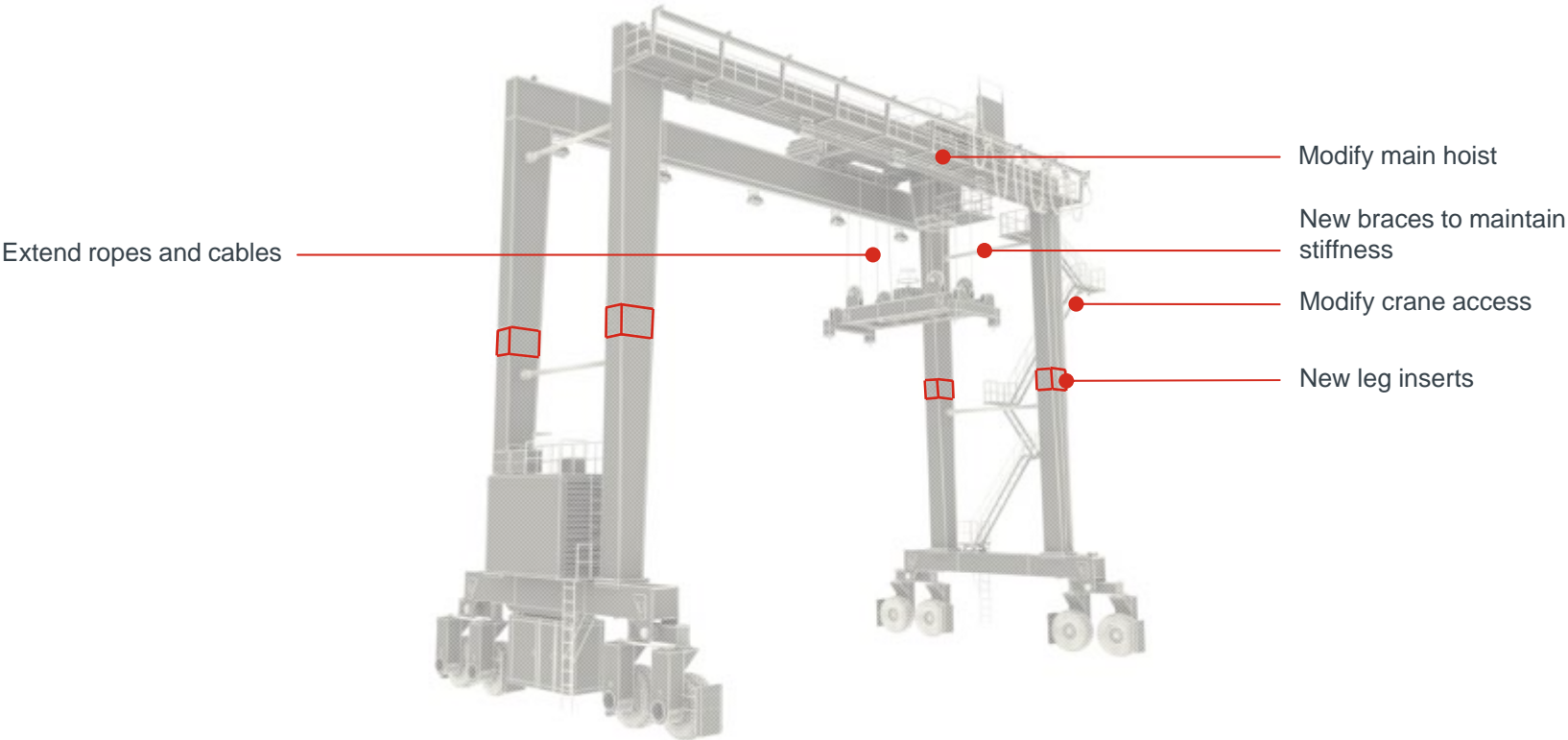
Upgrade and modernisation – STS-crane heightening and boom extension



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Upgrade and modernisation – RTG-crane heightening



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Upgrade and modernisation – budget and time indications

Budget indication (K€/ crane)

STS boom extension	250 – 1,000
STS crane heightening	750 – 1,250
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

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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

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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.

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Any job



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Five regional business centres that cover the world



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Summary

Why upgrade?

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

Why choose Kalmar?

- A trusted partner with a solid track record and service mindset
- Global reach
- Any crane, any job, anywhere.





Thank you!

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