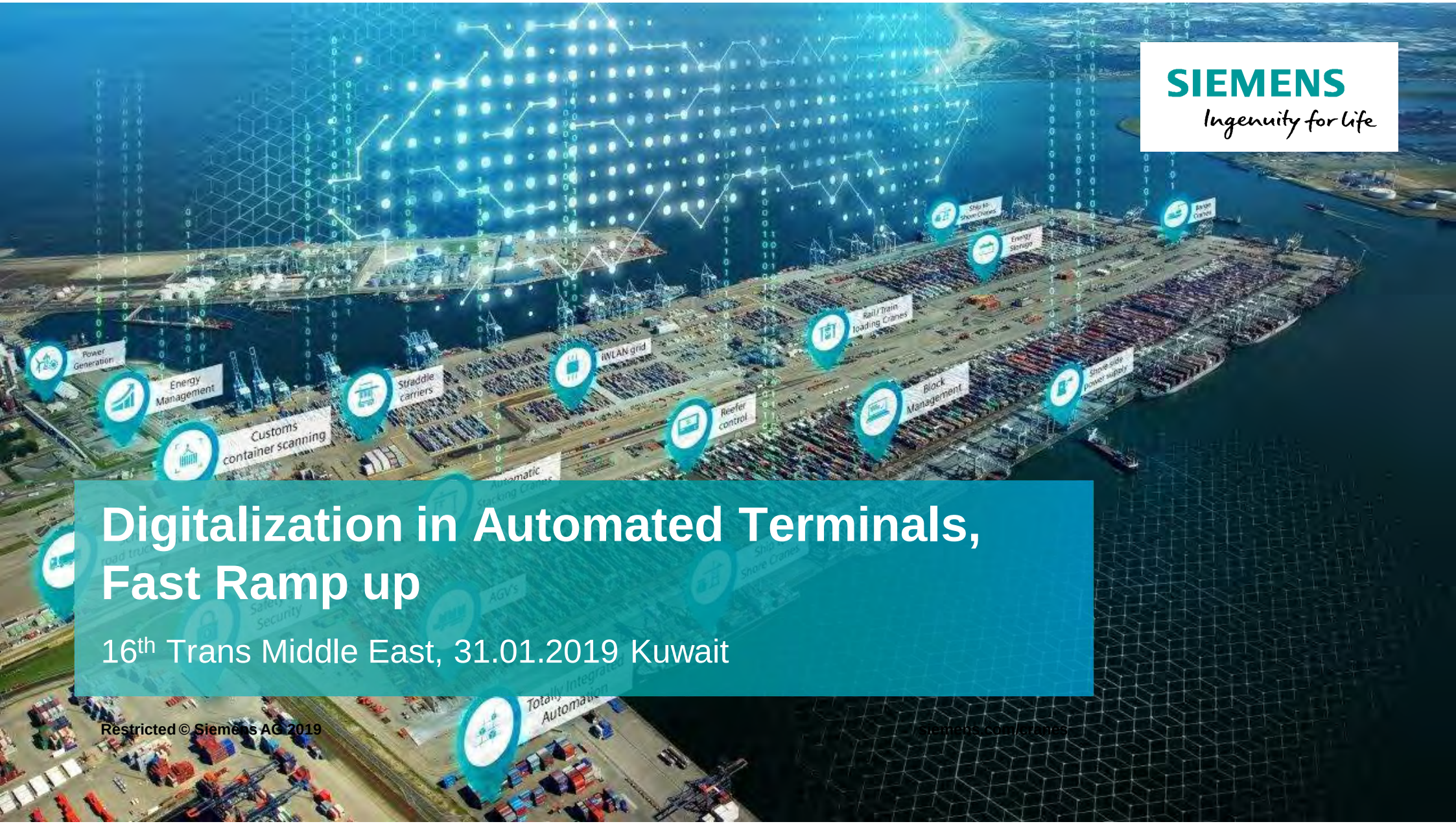

Digitalization in Automated Terminals, Fast Ramp up

16th Trans Middle East, 31.01.2019 Kuwait

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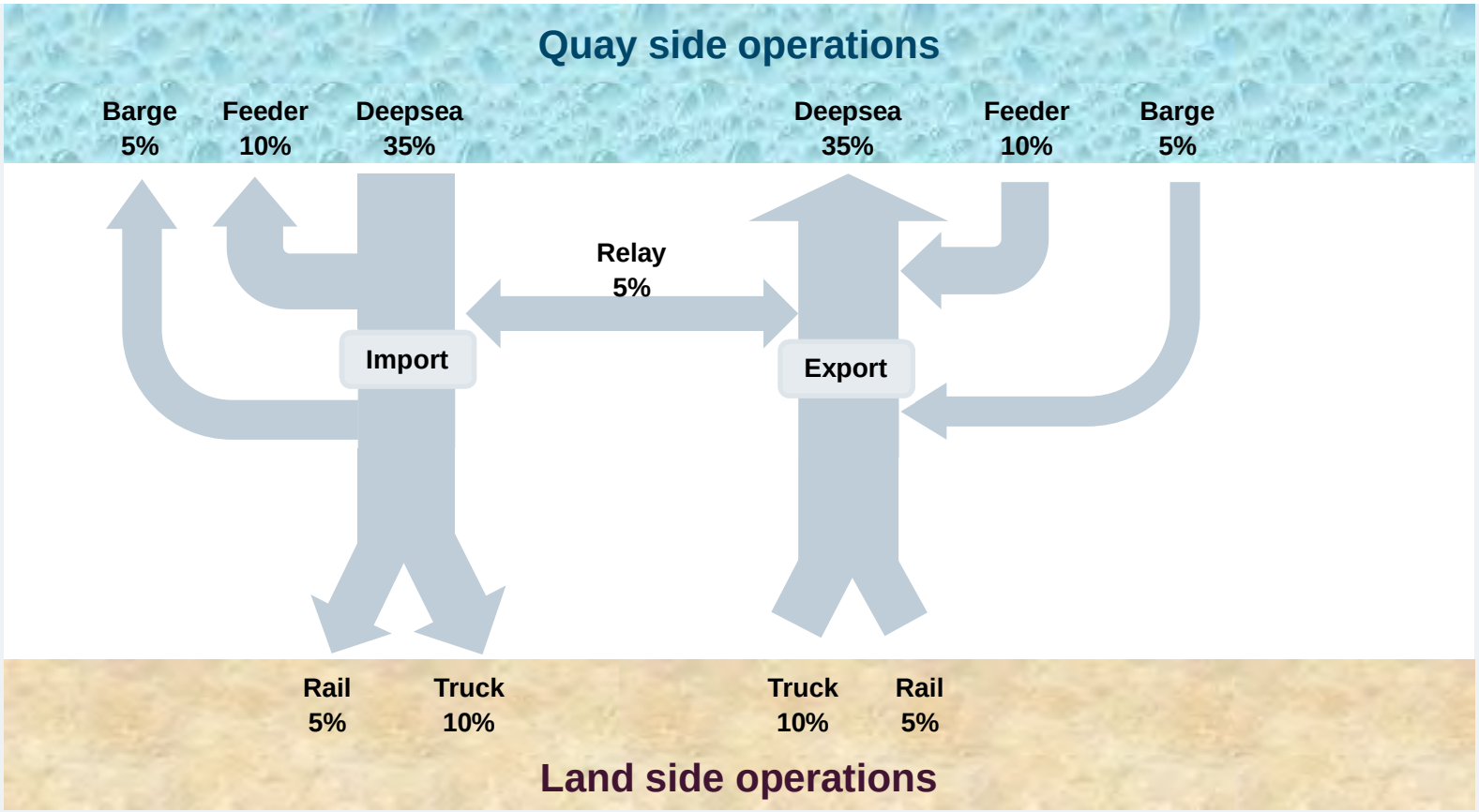
Container terminal types and characteristics

Example container flow on a terminal



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Overview Automated Container Terminals

End-loading concept for gateway terminals

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- Stacks are perpendicular to quay
- 2 portal yard cranes per stack
- Stack Interchange zones at the end of the stack
- Short travelling between quay and yard
- High yard stacking density
- Seperation of internal and external traffic
- Yard cranes will predominantly gantry travel

Majority of container throughput being import/export

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ECT Rotterdam Delta Terminal

Reference – Automated Rail Mounted Gantry Cranes end loading

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Overview Automated Container Terminals

Side-loading concept

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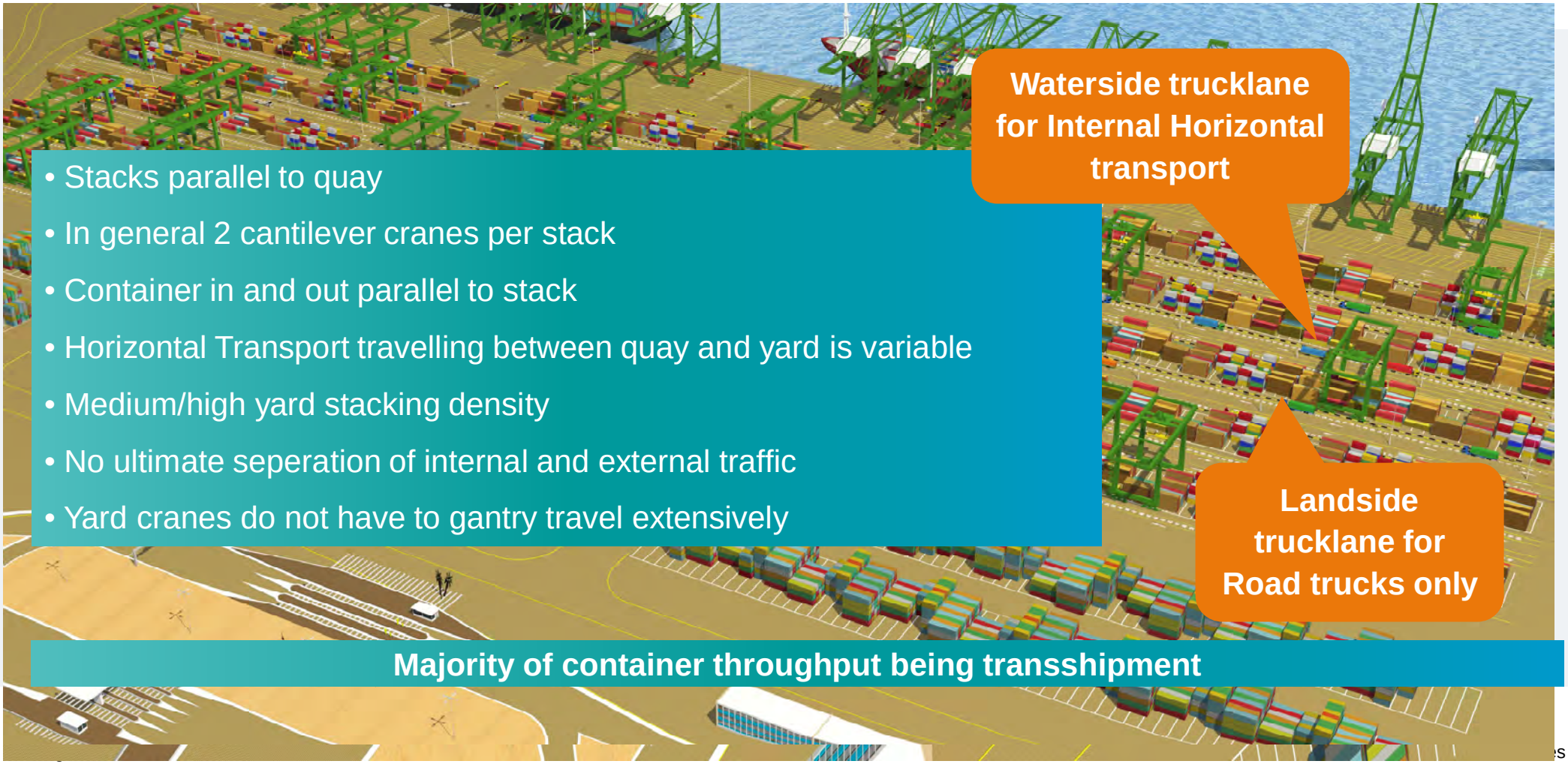

- Stacks parallel to quay
- In general 2 cantilever cranes per stack
- Container in and out parallel to stack
- Horizontal Transport travelling between quay and yard is variable
- Medium/high yard stacking density
- No ultimate seperation of internal and external traffic
- Yard cranes do not have to gantry travel extensively

Majority of container throughput being transshipment

PSA Singapore Pasir Panjang

Reference – Automated Rail Mounted Gantry Cranes side loading

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Overview Automated Container Terminals
The typicals for RMG-cranes

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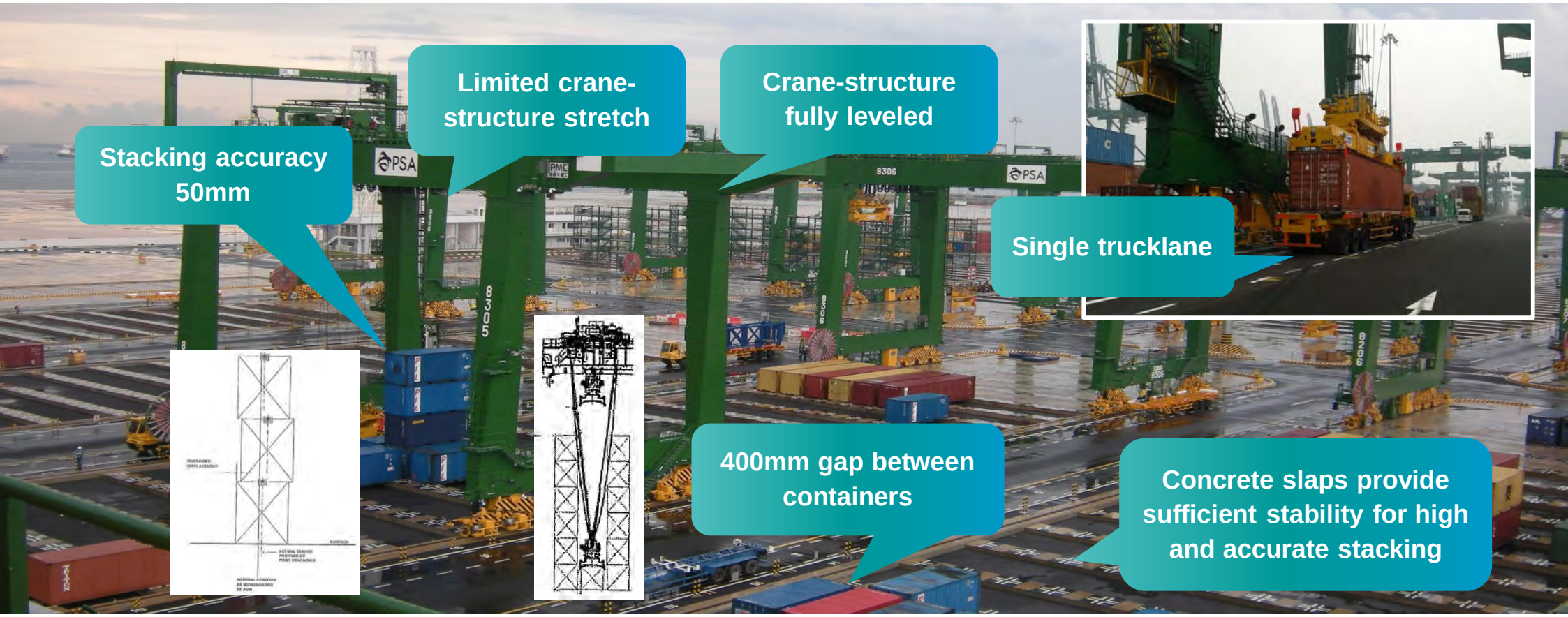

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Overview Automated Container Terminals
Side-loading concept: RTG-cranes

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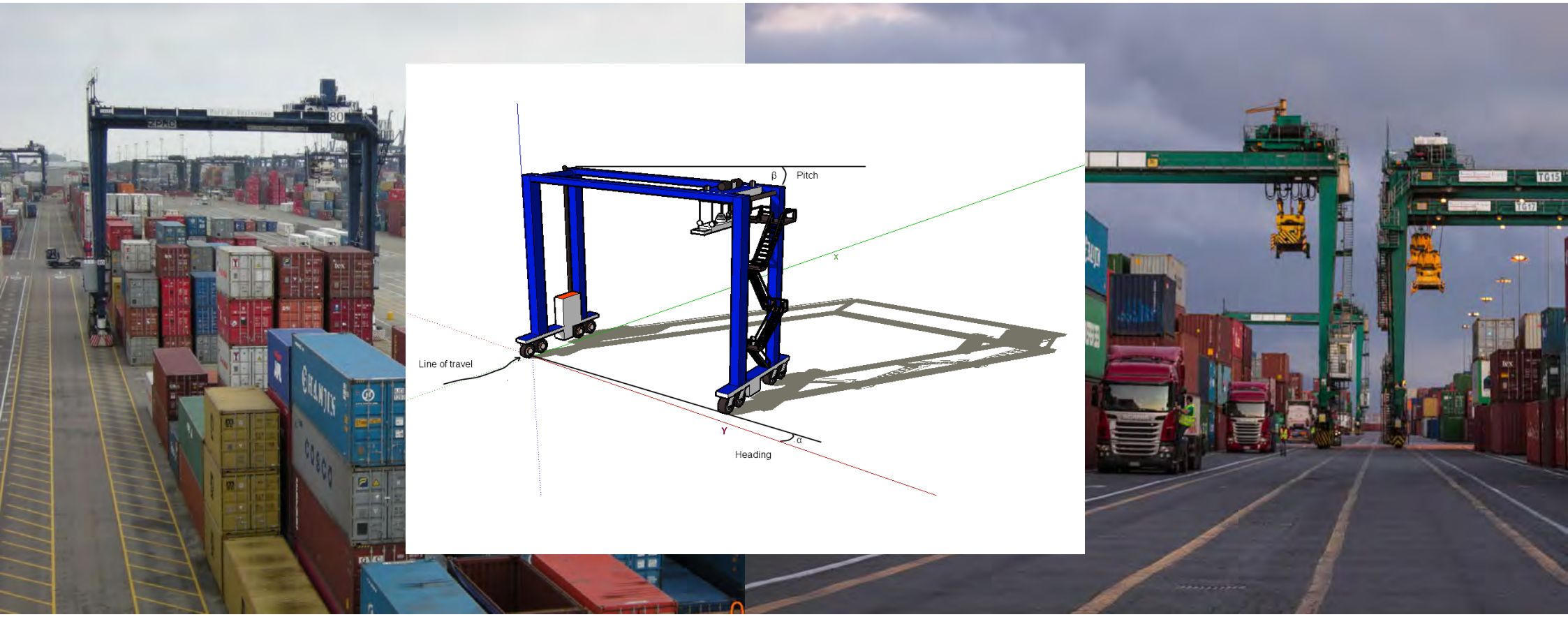

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Container Terminals

Supersized vessels result in peak loads on terminals

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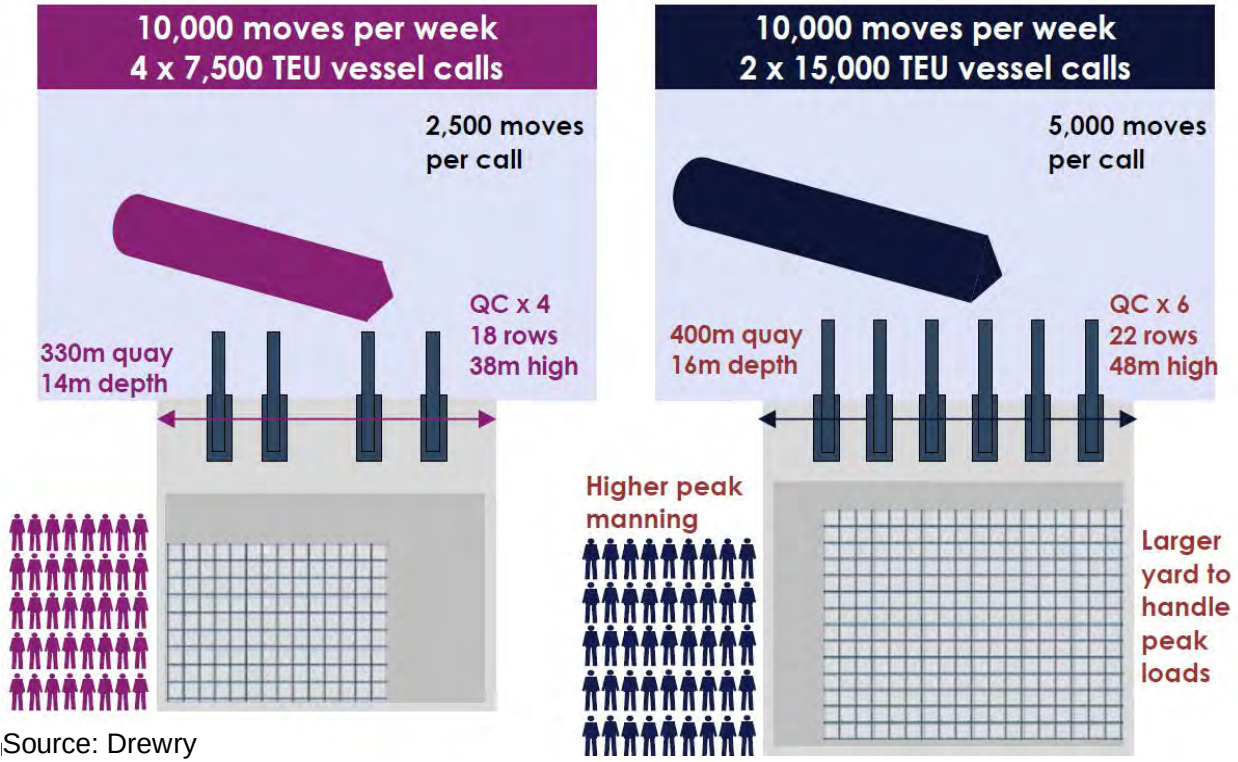
Terminals: invest or be obsolete?



Source: Drewry

Terminals: all in or fault?

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Side-loading concept: Cantilever RMG-cranes
Interchange zones

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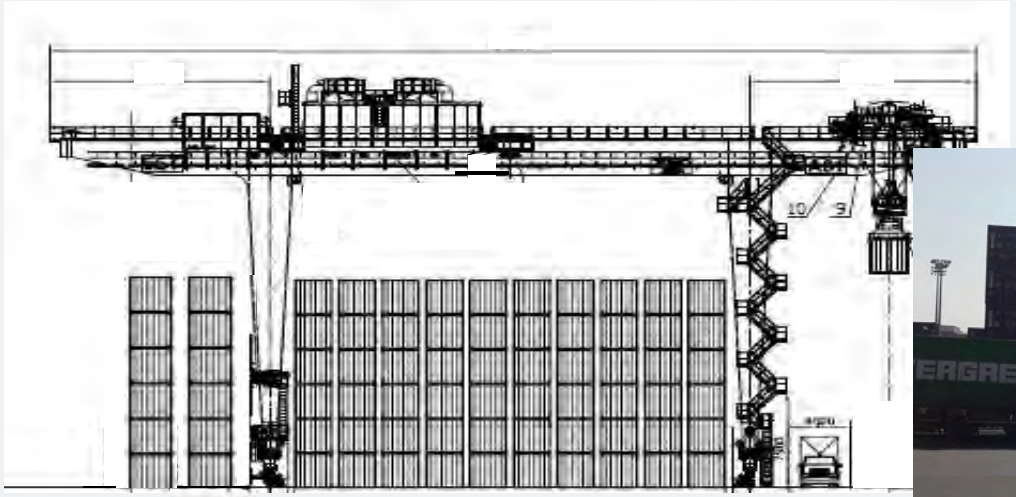
The search for more flexibility:

- **2 truck lanes**
- **creation of a transshipment stack by altering the landside trucklanes in stacking area**

landside



waterside

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Side-loading concept: Cantilever RMG-cranes
Interchange zones

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Ingenuity for life

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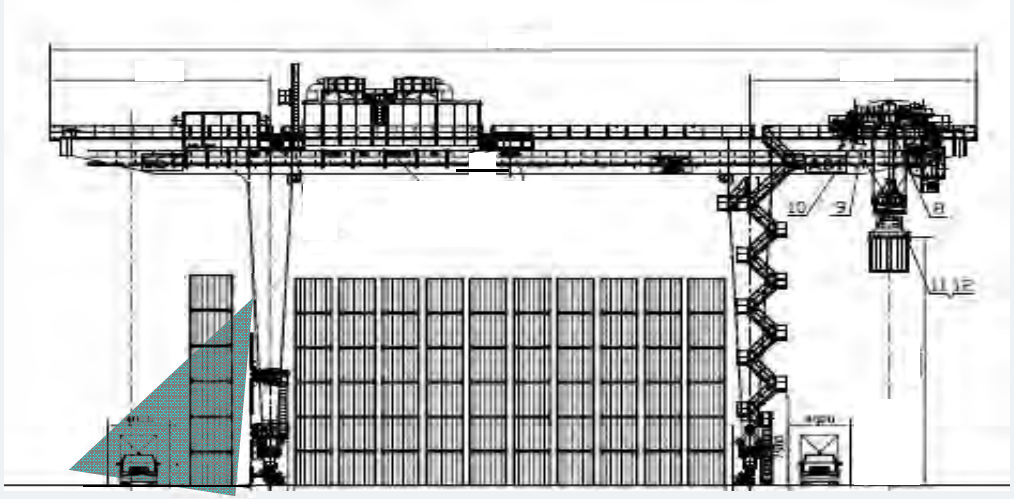
landside



waterside

- Workprodedures
- Chassis Alignment
- Prime Mover Recognition
- Container Number Recognition
- Chassis Lift Protection

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Side-loading concept: Cantilever RMG-cranes
Interchange zones

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End-loading concept: ASC-cranes
Interchange zones

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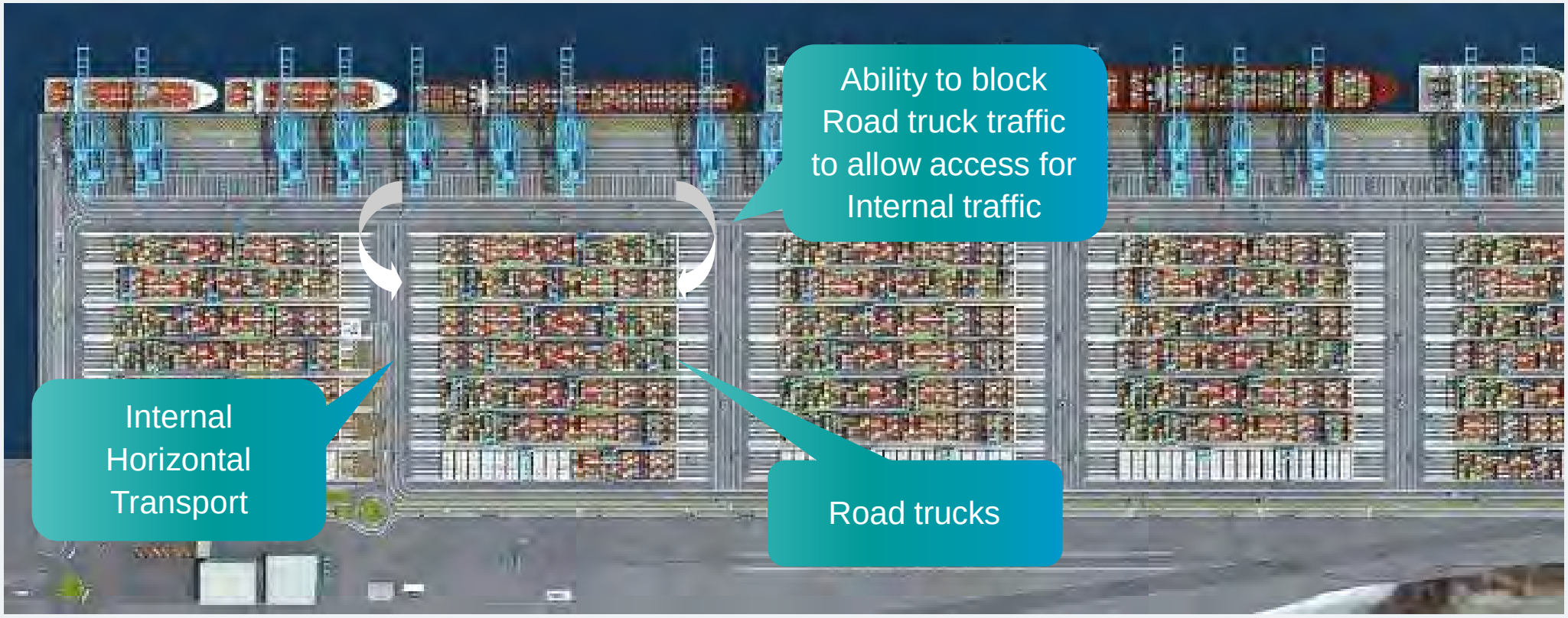
End-loading concept: ASC-cranes
Interchange zones



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APMT Tanger Med II

Reference - Automatic Stacking Cranes end loading

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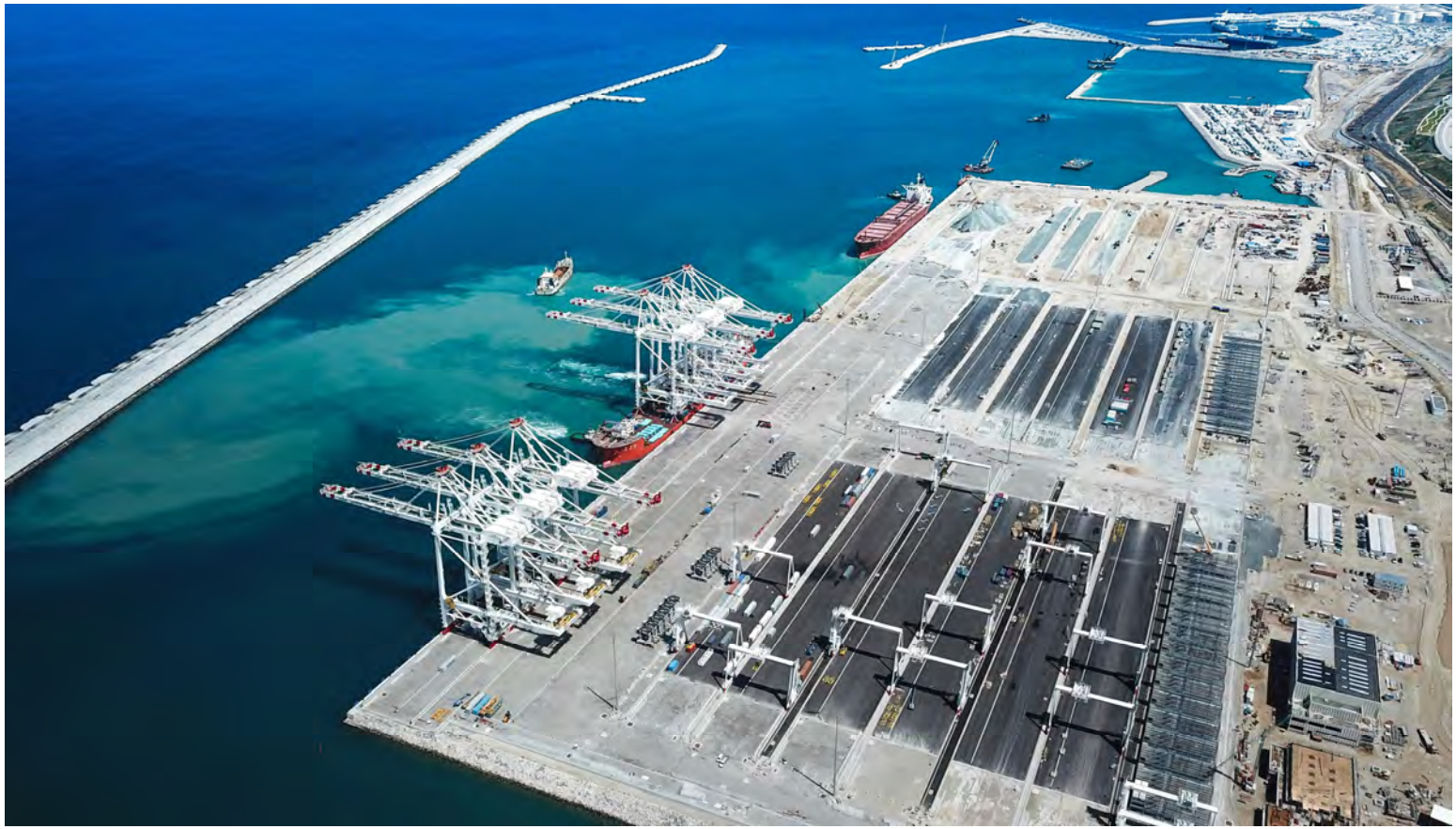

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Container Terminals
Digitalization Drivers

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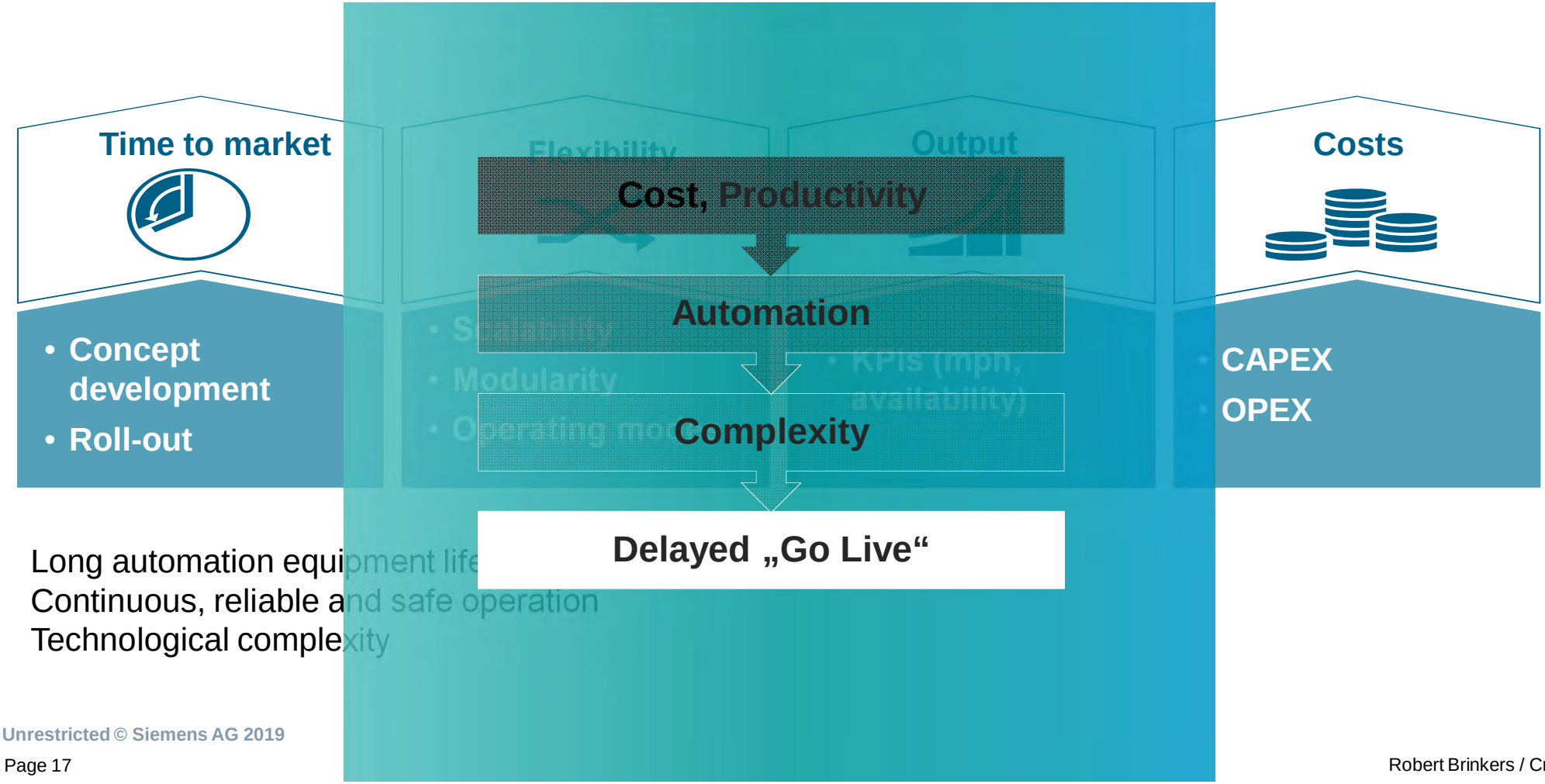

Long automation equipment life
Continuous, reliable and safe operation
Technological complexity

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Encountering the challenges of increasing demand for flexibility

Creation of a Digital Twin!

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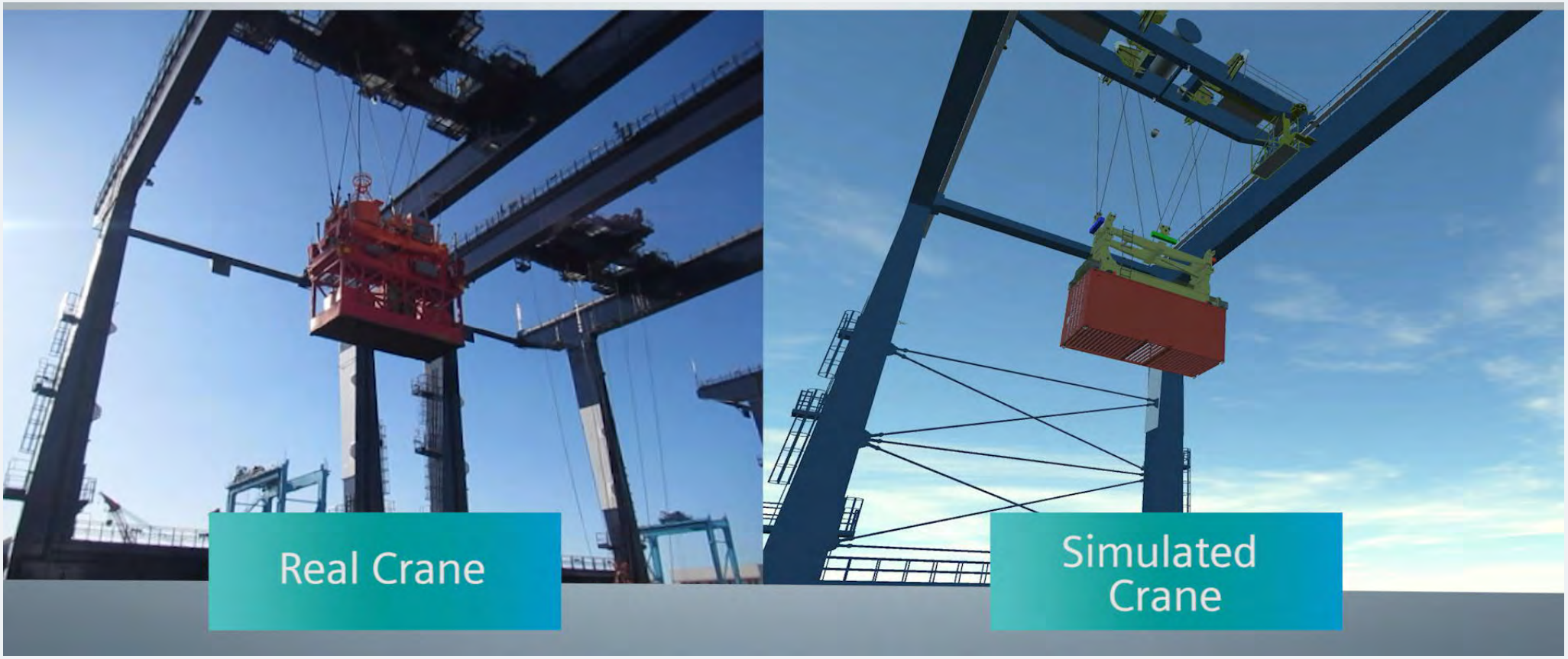

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Encountering the challenges of increasing demand for flexibility

Creation of a Digital Twin!

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Digital Twin

Virtual Crane adheres to real World behaviour

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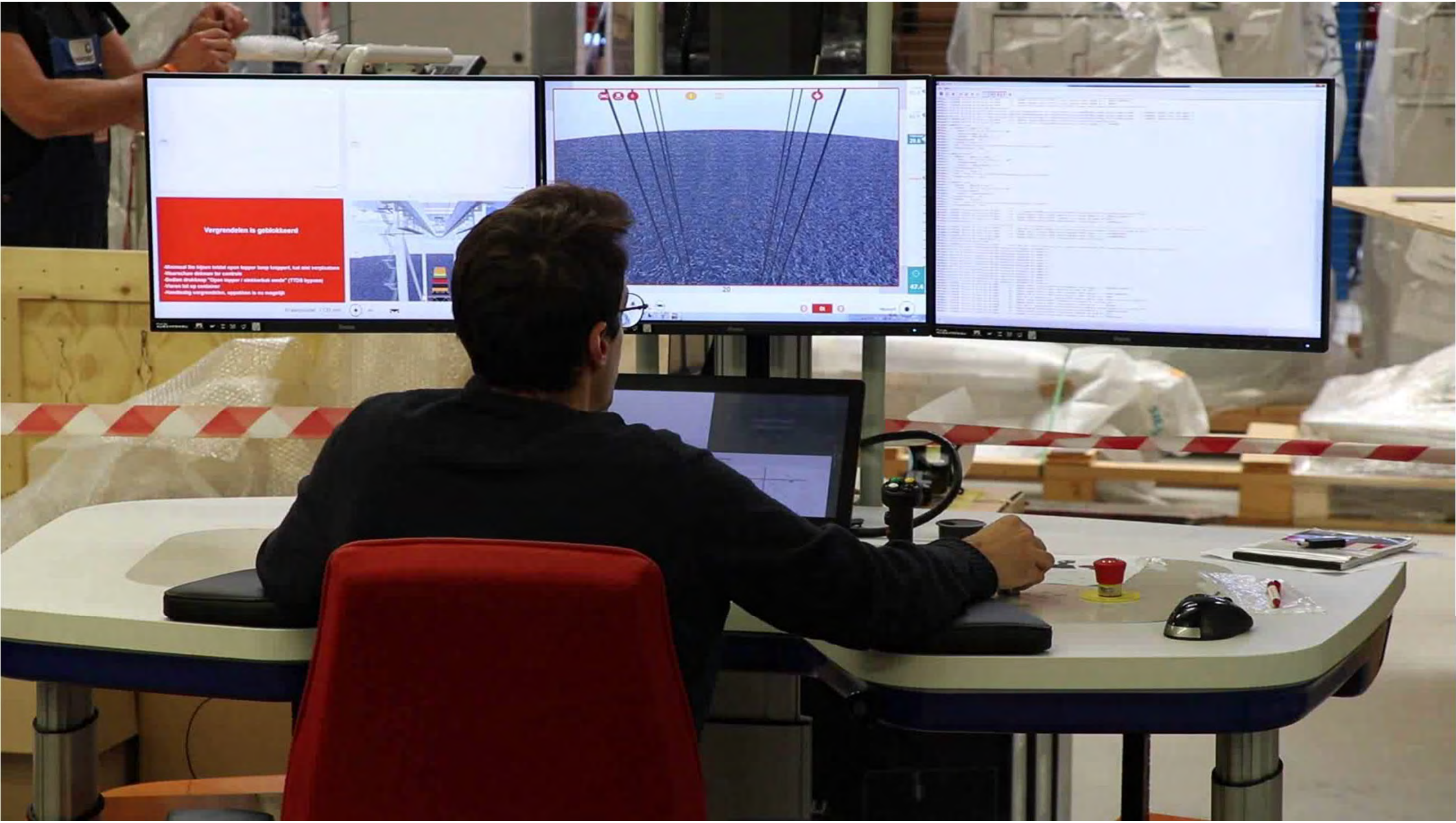
Vergrendelen is geblokkeerd

Simulation

Shortens time to go-live and productivity ramp up

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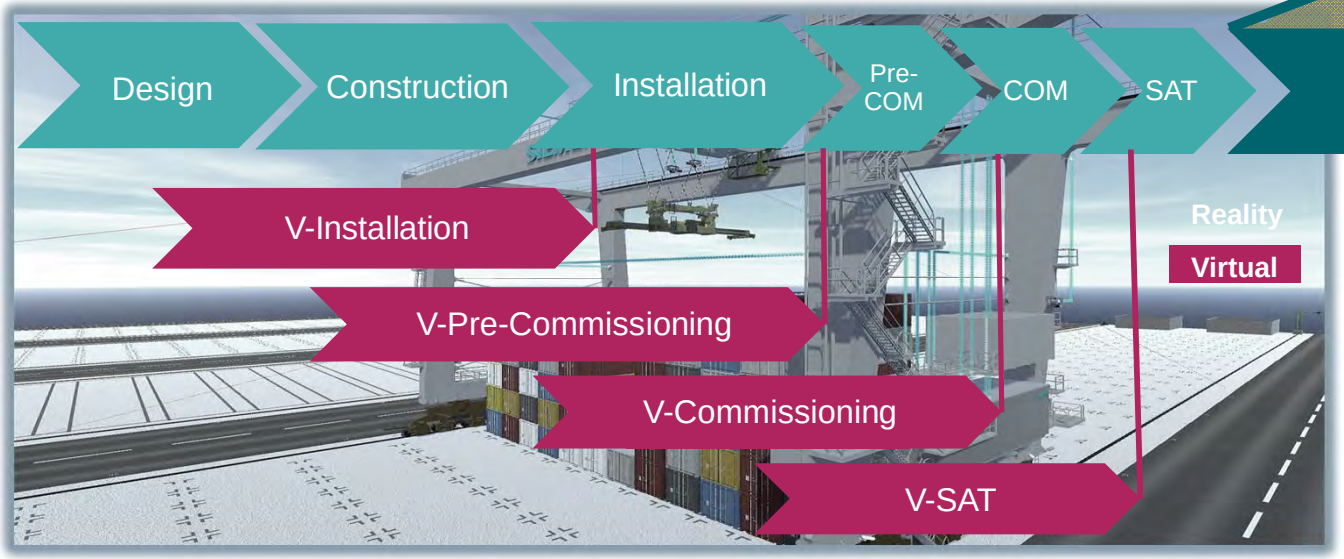

Shorter execution times

Transparency from the start

Early systems' integration tests

Faster commissioning

Early design and KPI verification

Early Operations engagement

Robert Brinkers / Cranes

Contact page

Robert Brinkers
Sales manager
LD CR / Netherlands / Projecthouse

Prinses Beatrixlaan 800
2500BB The Hague

Mobile: +31 6 231 000 86

E-mail:
robert.brinkers@siemens.com

siemens.com

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