CRANE OCR

Brownfield Implementation

29 March 2023

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CERTUS AUTOMATION

AGENDA

- CERTUS Introduction
- Benefits of Crane OCR
- Vision Technology Evolution
- Crane OCR Installation – Brownfield Case

CERTUS WORLD-WIDE

Headquarters:
The Netherlands

350+

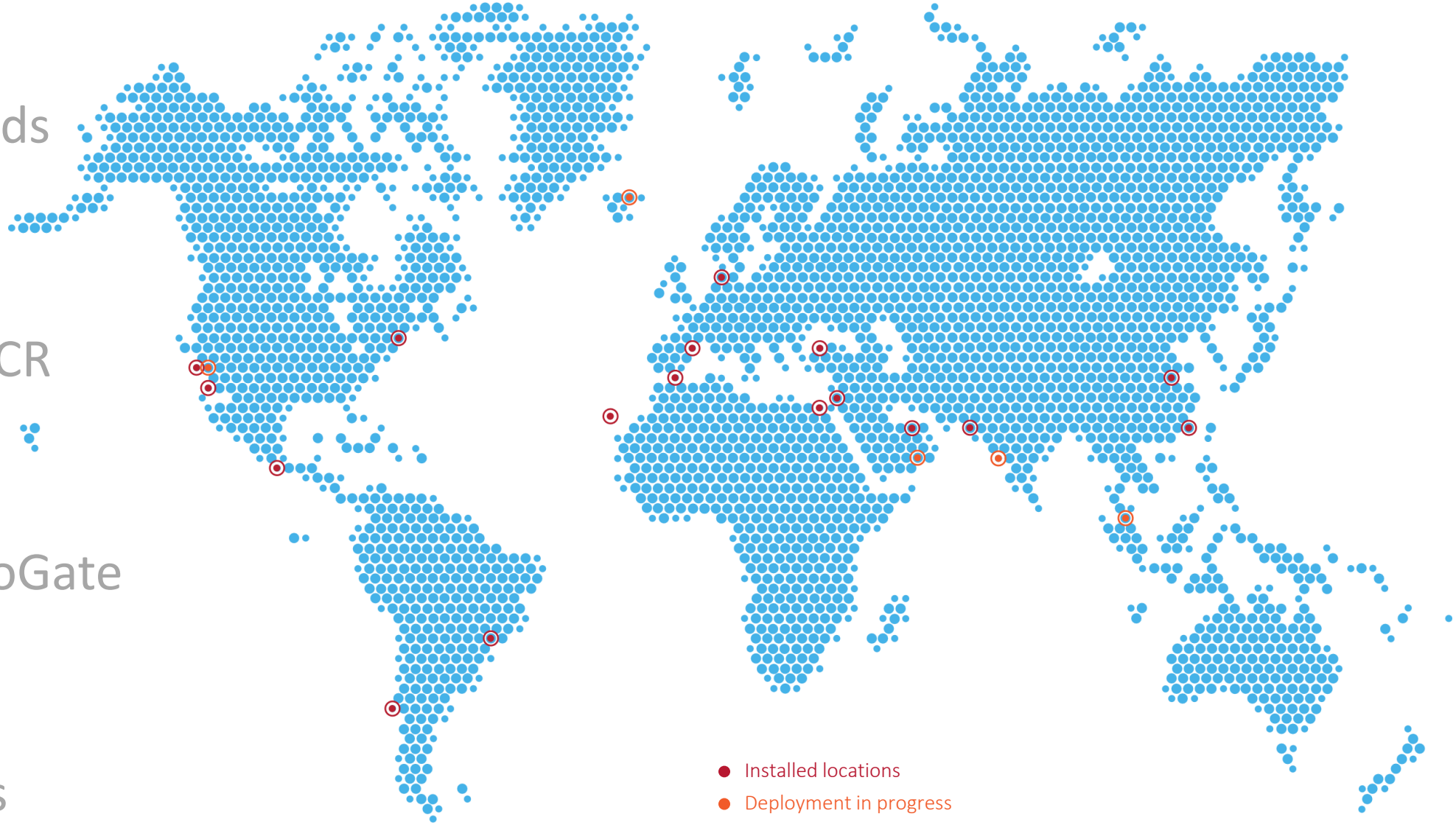
Cranes with OCR

75+

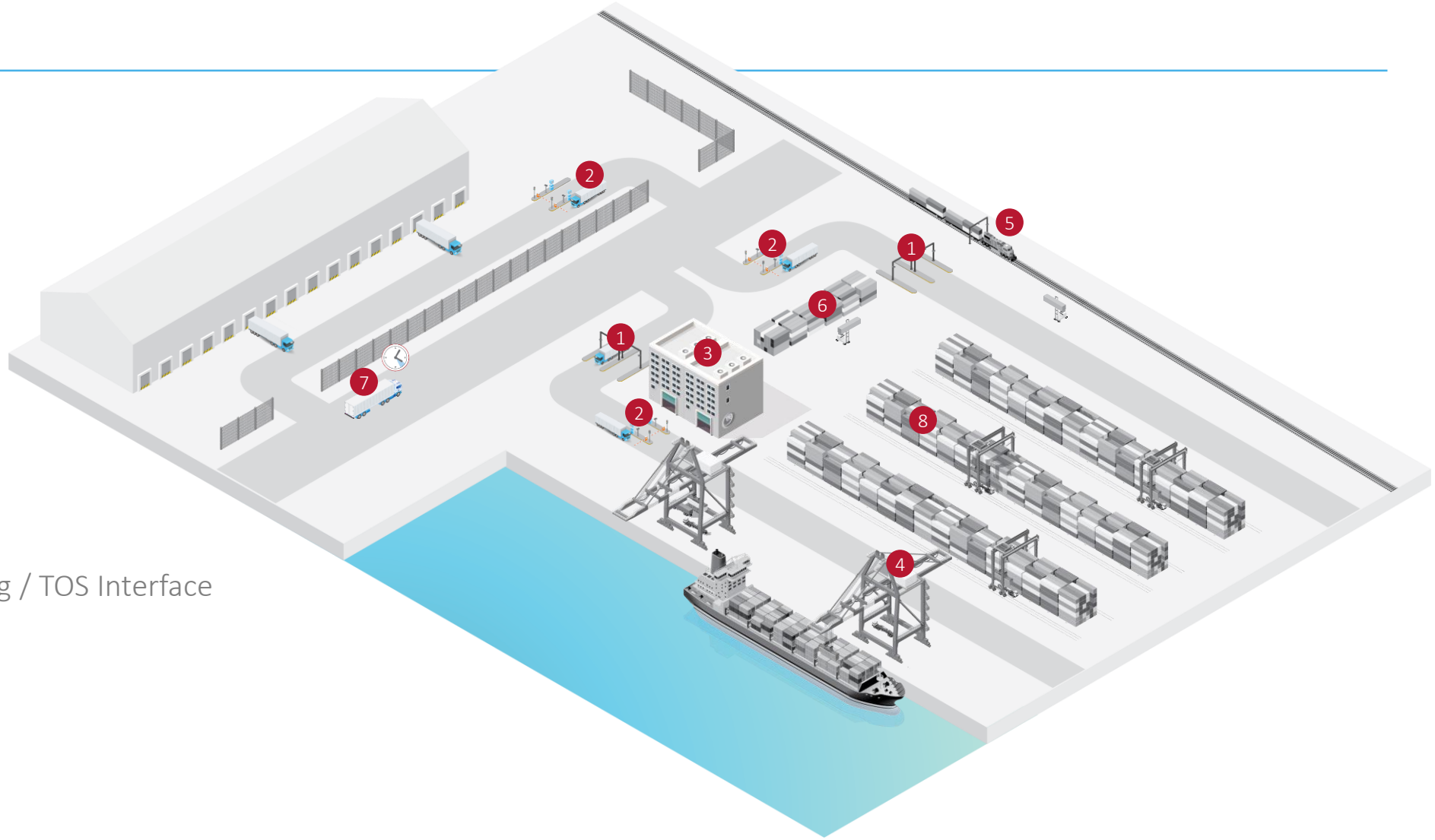
Sites with AutoGate

40+

Different ports



OUR WORKFIELD



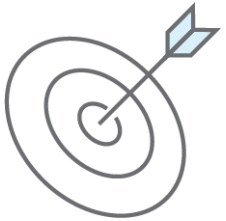
1. Gate OCR Portal
2. Gate Lane Kiosks
3. Central Exception Handling / TOS Interface
4. STS Crane OCR
5. Rail OCR
6. Stacker OCR
7. Vehicle Booking System
8. Yard Crane OCR

BROWNFIELD CONTAINER TERMINAL

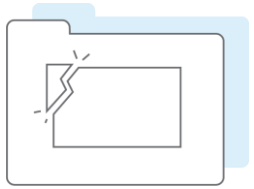
4 STS Crane OCR

BENEFITS OF CRANE OCR:

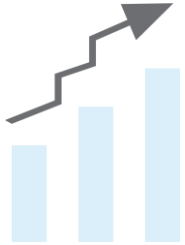
Safety



Transaction accuracy

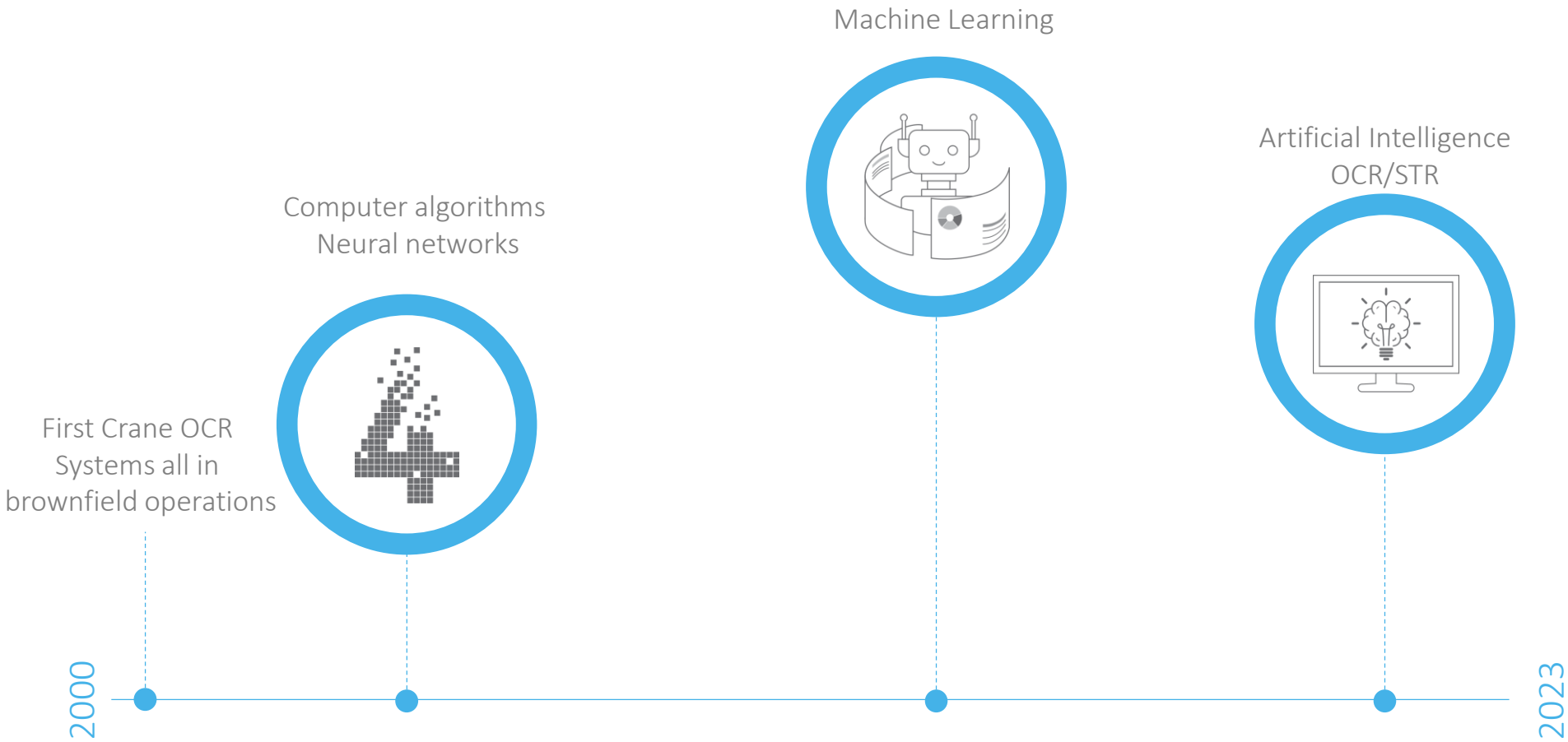


Damage alert / archiving



Productivity

CRANE OCR HISTORY: ALGORITHMS | MACHINE / DEEP LEARNING | AI



CRANE OCR HISTORY: ALGORITHMS | MACHINE LEARNING | AI

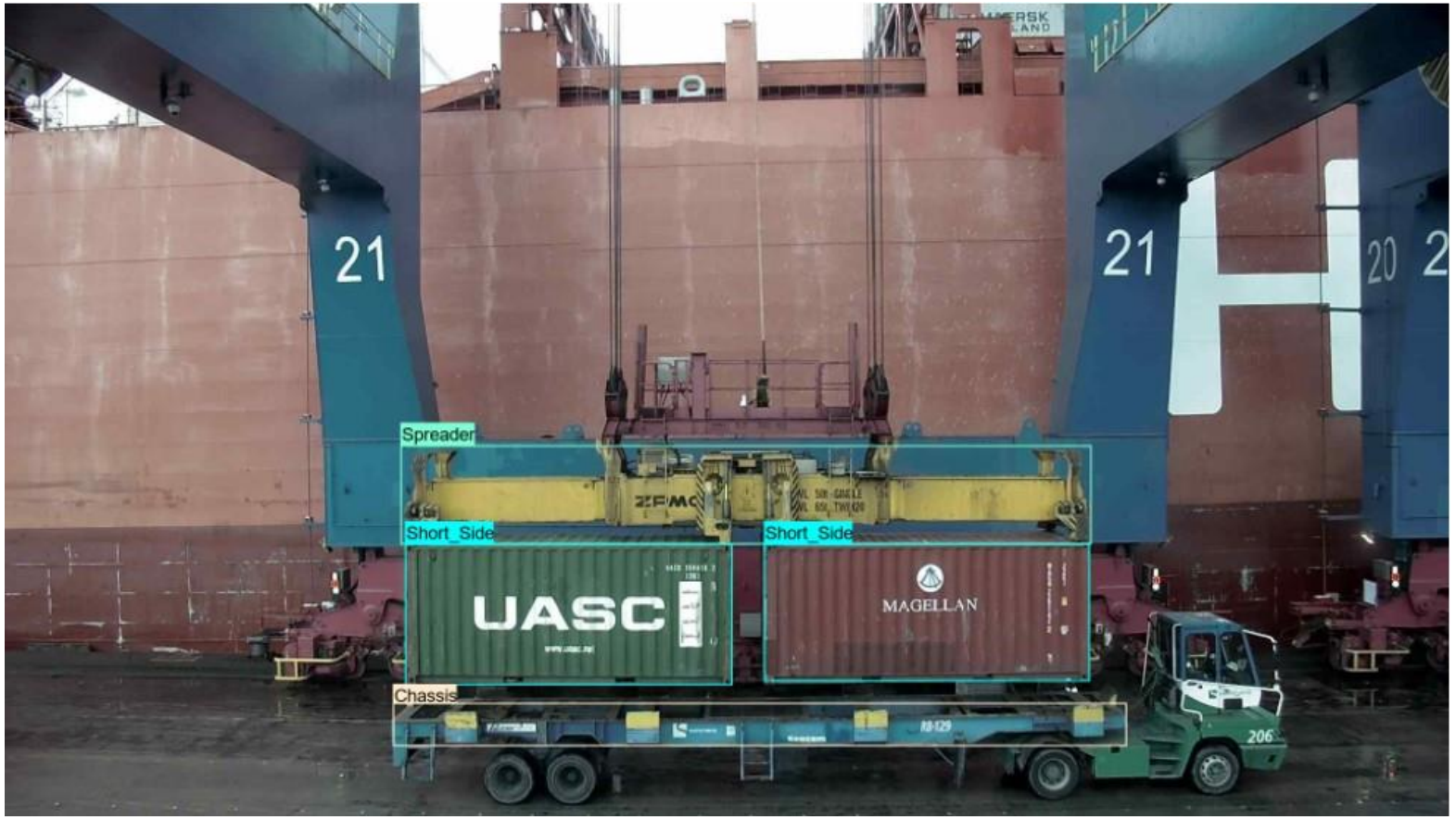
AI – Give basic instructions / parameters to the tool and let the intelligence take if from there

Result:

- Highly Accurate

- Faster

Example: Tractor Alignment System

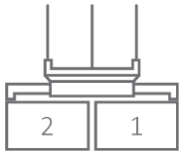


CRANE OCR | Features

TERMINAL TRACTOR ID

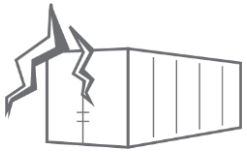
CONTAINER CODE

ISO CODE

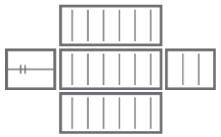


CONTAINER SEQUENCE

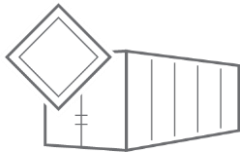
CONTAINER POSITION



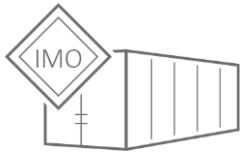
DAMAGE ALARM



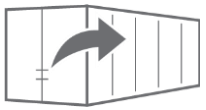
5 SIDE DAMAGE IMAGES



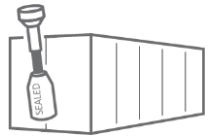
HAZARDOUS PLACARD PRESENCE



HAZARDOUS PLACARD CLASS



DOOR DIRECTION

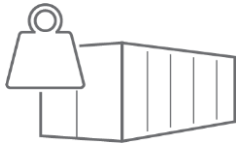


SEAL PRESENCE

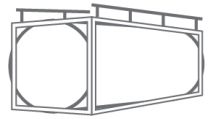
TWIST LOCKS

AI Enables rapid new feature development

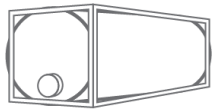
HEAVY LOAD INDICATOR



WEIGHT RECOGNITION (Max Gross, Tare, Net)



TANK RAILS

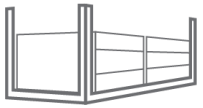


TANK VALVE

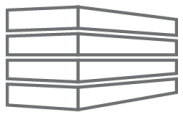
WORKING ON NEW FEATURES EVERY DAY

C-STOW DETECTION

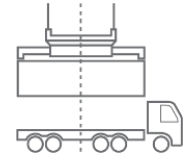
HATCH COVERS



GEAR BOXES



BUNDLES



TRUCK ALIGNMENT*

VIRTUAL PLC

Short Term

Back-up to PLC

Automatic offset correction

Roadmap

Full alternative to PLC for OCR capture

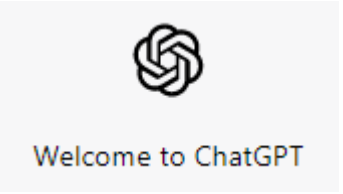
Rust
Rust
Rust
Rust
Rust
Rust
Dent: 100%
Dent: 100%
Dent: 100%
Dent: 99%
Dent: 99%
Dent: 100%
Dent: 100%
Dent: 100%
Dent: 100%
Dent: 100%
Dent: 100%
Dent: 83%
Dent: 100%
Dent: 100%
MOCU 229756 1
MOCU 229756 1
GAOU 606035 3
45G1
CMA CGM
CSFU 9
4EG1
TCLU 735080 0
MinorDent
MinorDent
3000
3500
msc

CRANE OCR – Terminal Tractor ID

Installation - AI(?)

Maybe someday…

In the meantime, what does AI Tool ChatGPT say about the topic?



Installation of Crane OCR - ChatGPT

- Choose the right OCR system
- Follow the installation instructions
- Integrate with the Crane Control System
- Test the system
- Train the ~~crane operators~~ Exception clerks

Installation – ChatGPT vs Reality

It is recommended to consult with experts who have experience installing OCR systems on cranes and to follow the specific instructions provided by the OCR system and crane manufacturers to ensure a successful installation.

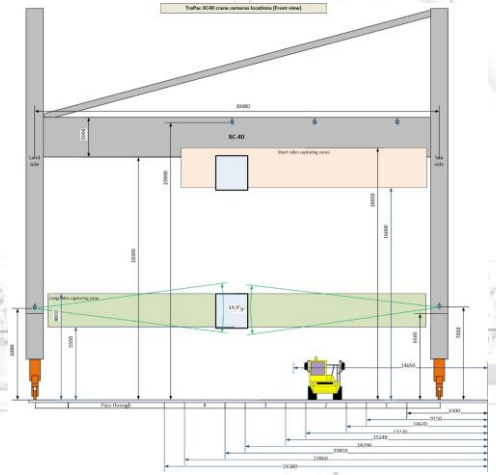
"consult with experts" ☑

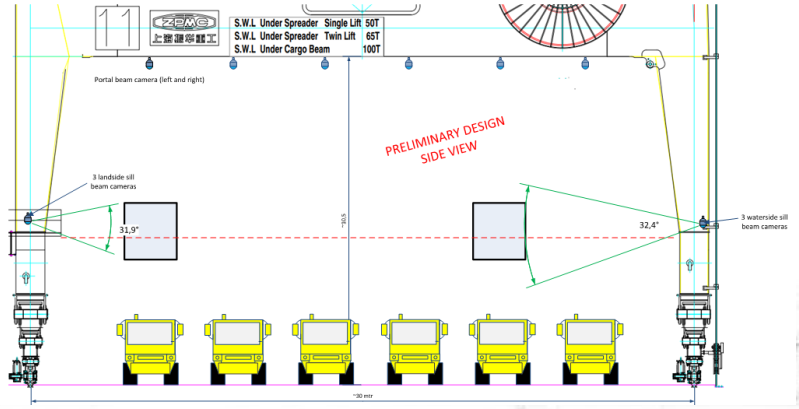
- Not complex.
- Ready to start in a matter of weeks
- Ready to show initial results in a couple of months

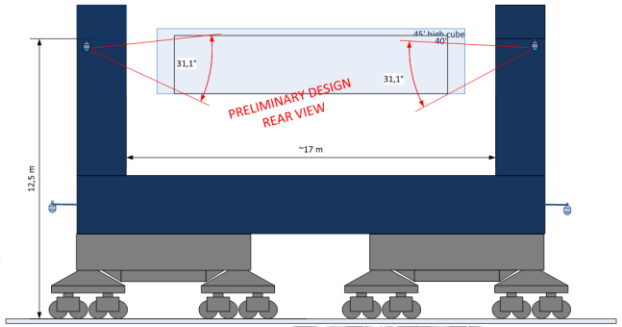
…HOW?

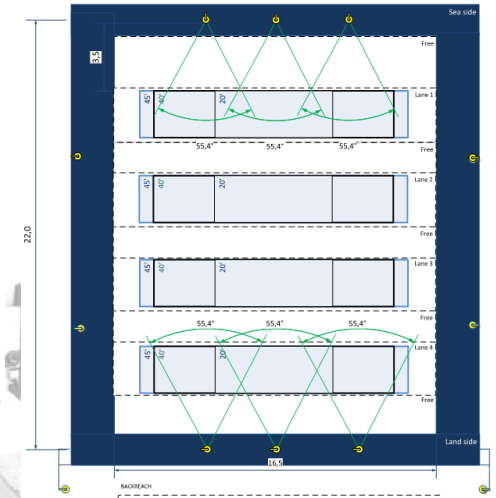
CRANE OCR DESIGN

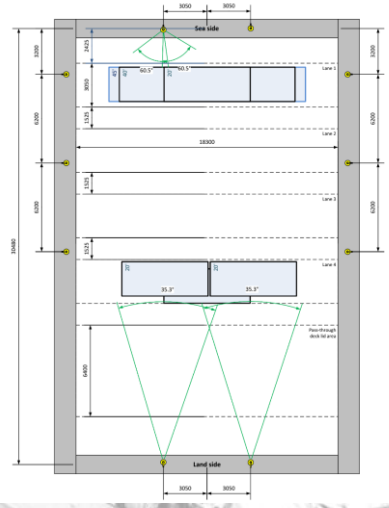
- Standard templates
- Variables may differ
- +350 STS Cranes
- +100 ARMGs

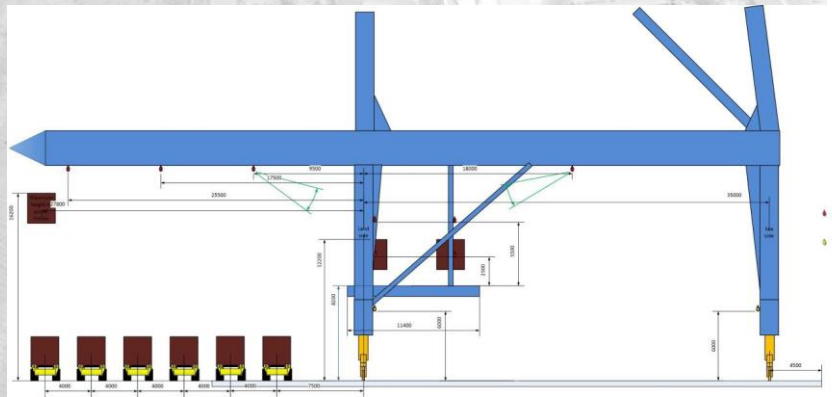


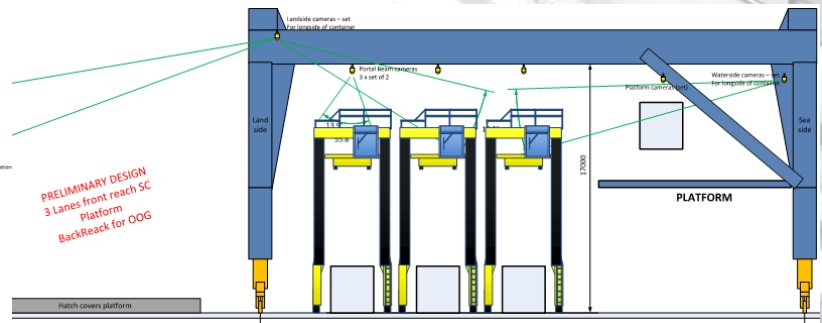






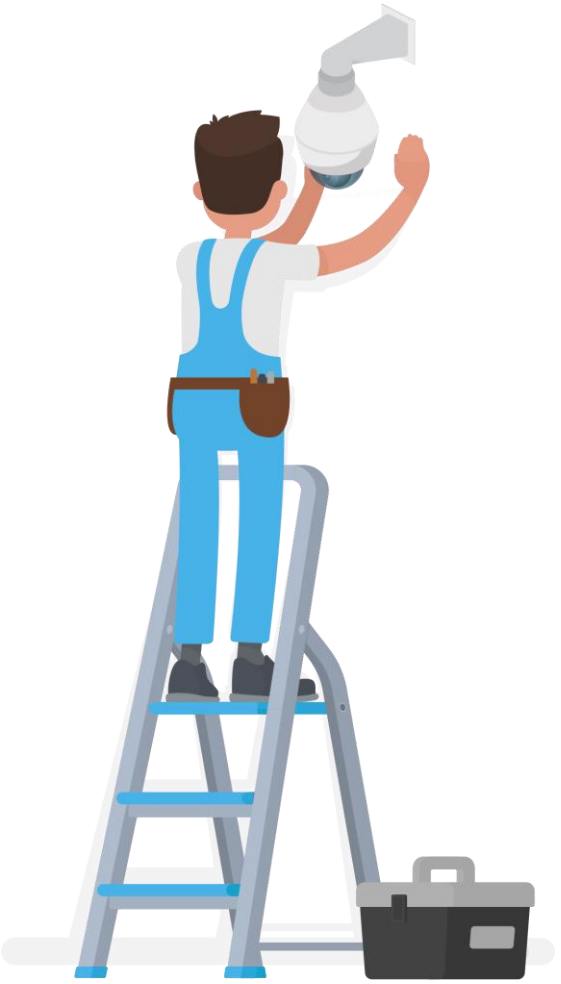




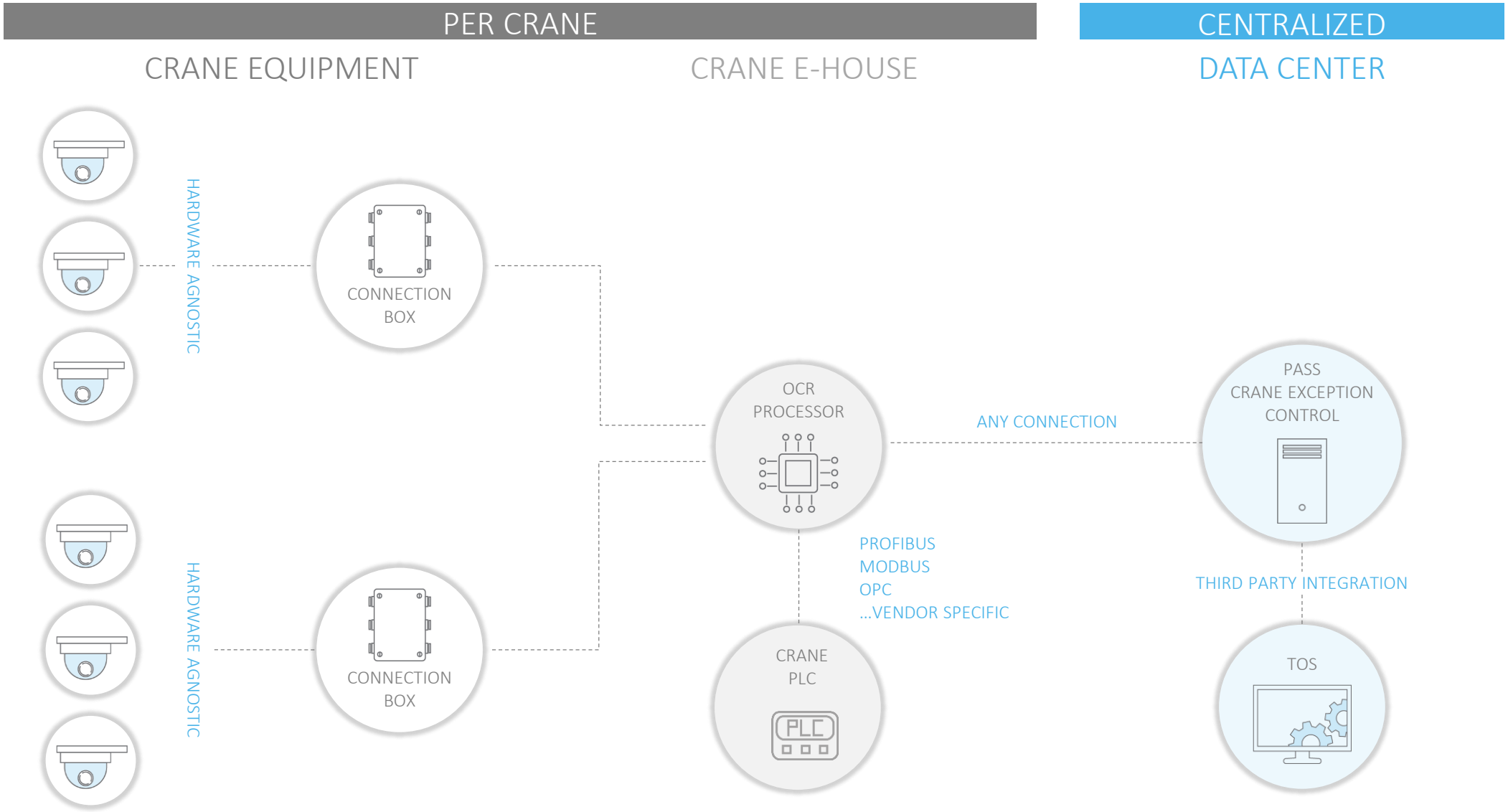


BROWNFIELD INSTALLATION

- Quick installation of cameras with magnetic brackets
- Installation < 1 week during regular crane maintenance
- Total set-up time, including software ~1 month



CRANE OCR | Architecture



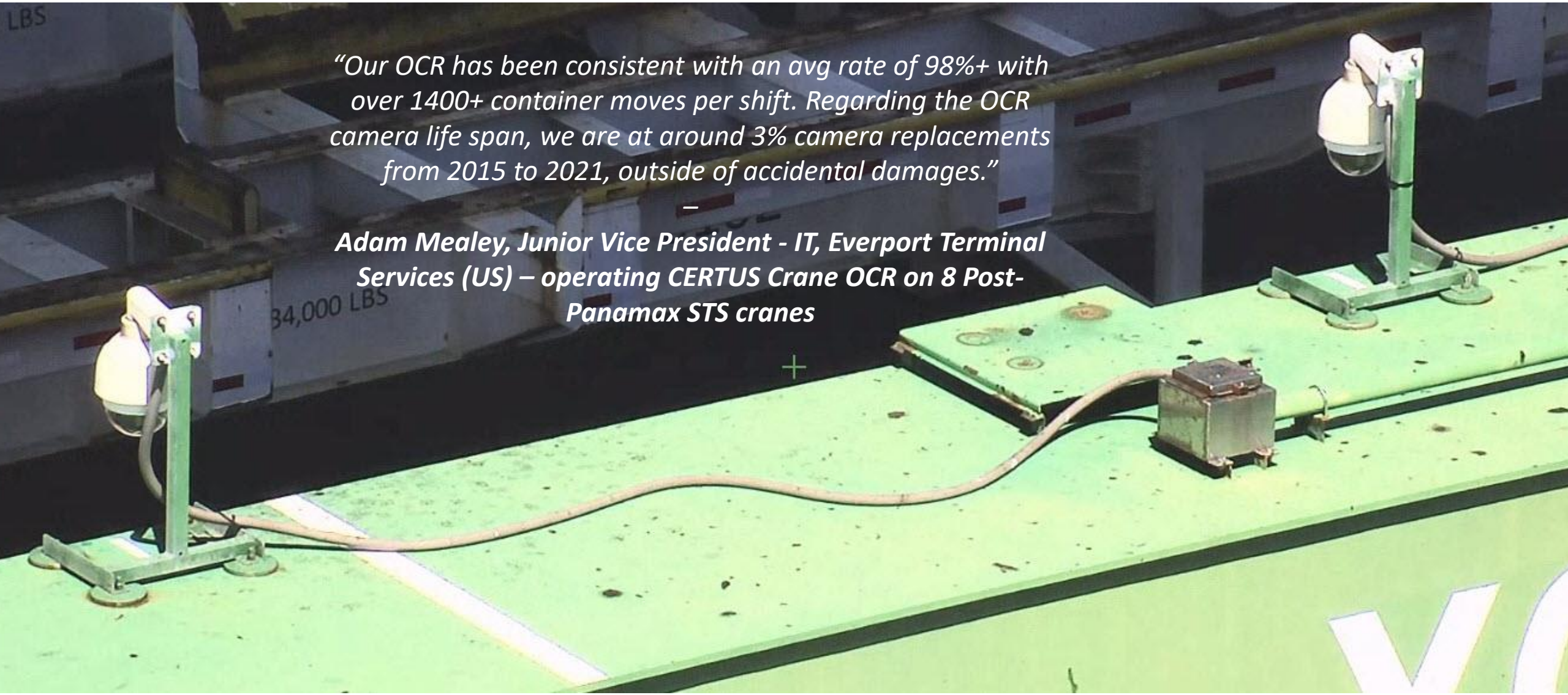
CERTUS AUTOMATION

Brownfield installation

Magnets (4) - Standard brackets – Welded stud with conduit clamp supporting cable conduit

Brownfield installation

External cable routing with magnets also an option



"Our OCR has been consistent with an avg rate of 98%+ with over 1400+ container moves per shift. Regarding the OCR camera life span, we are at around 3% camera replacements from 2015 to 2021, outside of accidental damages."

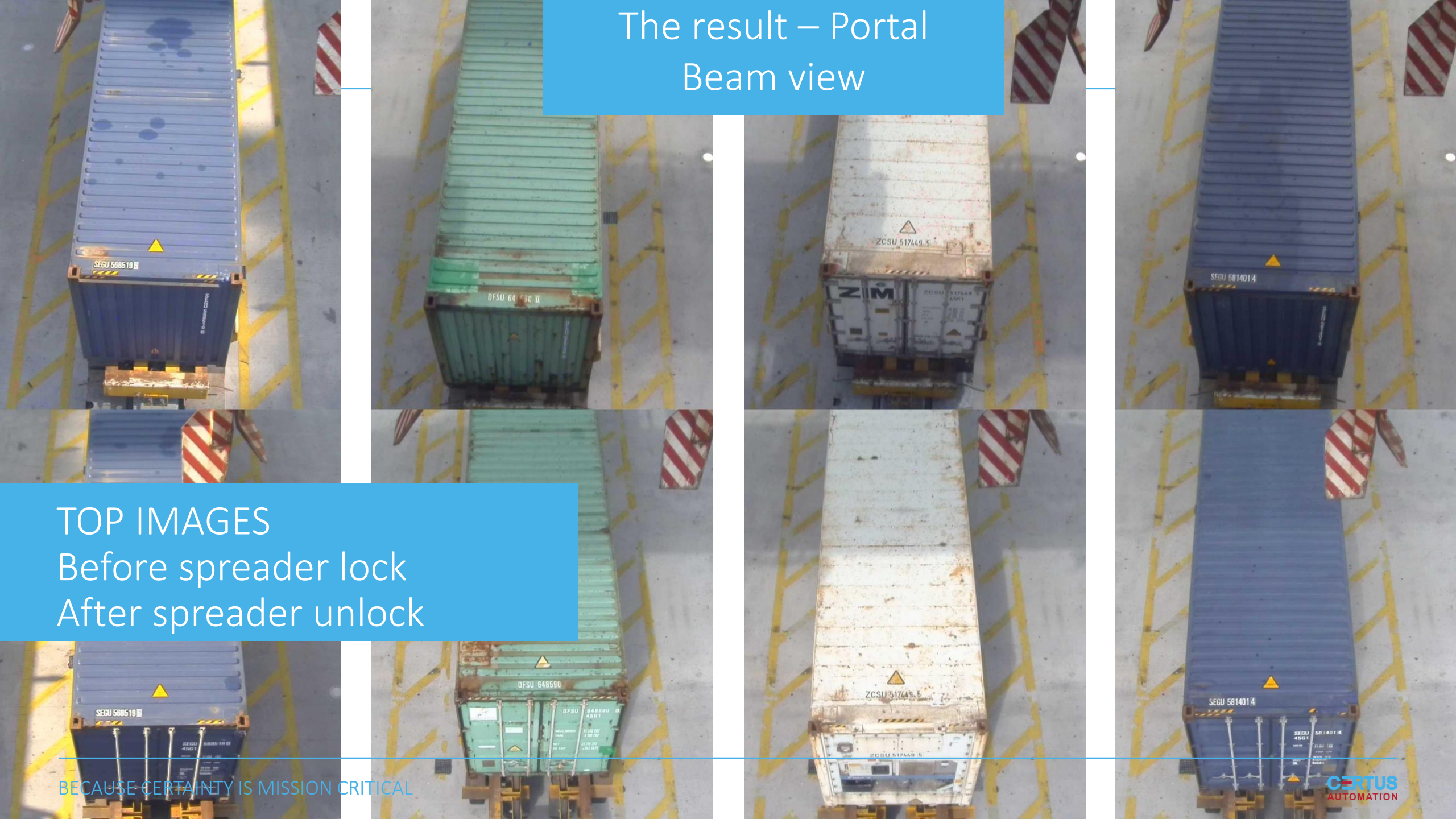
–

Adam Mealey, Junior Vice President - IT, Everport Terminal Services (US) – operating CERTUS Crane OCR on 8 Post-Panamax STS cranes

Brownfield installation

Standard brackets – Magnets (4-6)

The result – Portal Beam view



TOP IMAGES
Before spreader lock
After spreader unlock

The result – Portal Beam view

FRONT / BACK IMAGES

PTZ Capture

EXCEPTION CONTROL | User Interface

- Remote Management
- Relocate Checker Inside
- Run Cranes in parallel - manual and OCR enabled during install

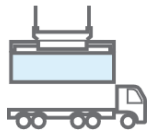
Summary – Why Not Start with Crane OCR Today?

QUICK INSTALLATION

Mounting on the crane with magnetic brackets

HIGH RELIABILITY

Multi camera solution to ensure redundancy
And high availability.



TERMINAL TRACTOR HAND-OFF

Automated hand-off between the STS Crane and tractor
without extra hardware installation.

5-SIDES DAMAGE IMAGES

Output of images from all sides including top
to handle damage claims faster

STANDARDIZED HARDWARE

Proven, off the shelf hardware with short
lead time

THANK YOU

b.wells@certusautomation.com