SIEMENS
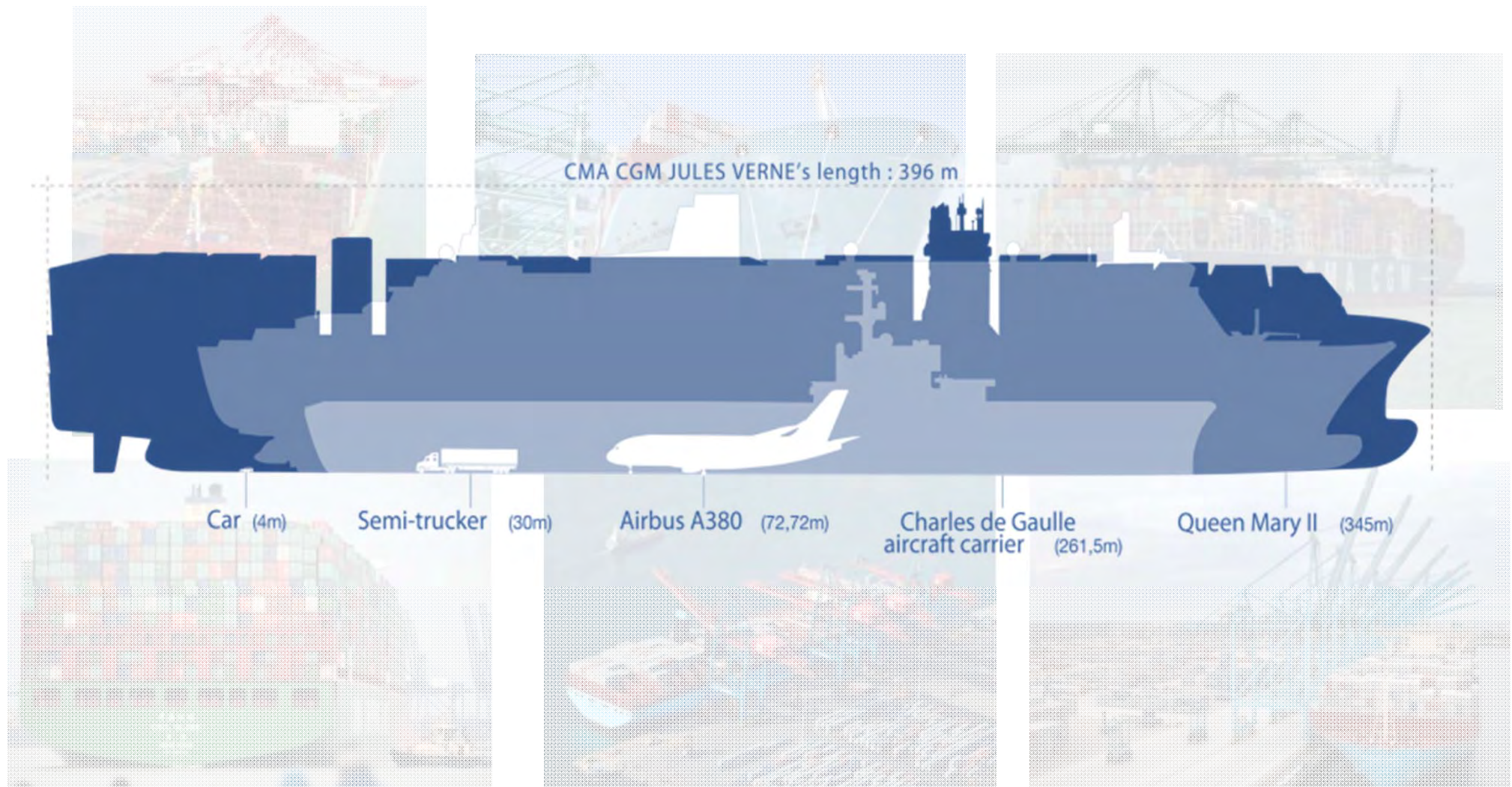
Indian Ocean Port and Logistics, La Reunion – January 28th – 29th, 2016

Integrated solutions for increased efficiency in port operations

What do the names "Emma", "Jules Verne", "Globe" or "Oscar" have in common?

CMA CGM JULES VERNE's length : 396 m

Car (4m) Semi-trucker (30m) Airbus A380 (72,72m) Charles de Gaulle aircraft carrier (261,5m) Queen Mary II (345m)

Bigger ships are being used to due lower cost per transported container

# This trend has significant influence on the world's Cranes business

Vessel cascading

Average ship size (teu)

- Asia-N Europe
- Asia-Med
- Europe-ECSA
- Asia-WCSA
- Asia-Mid-East
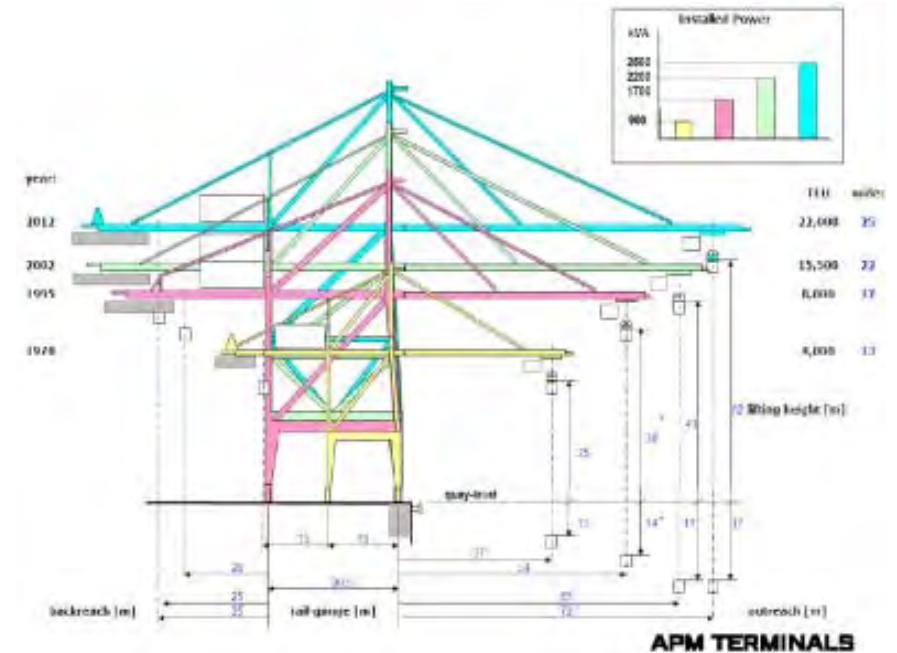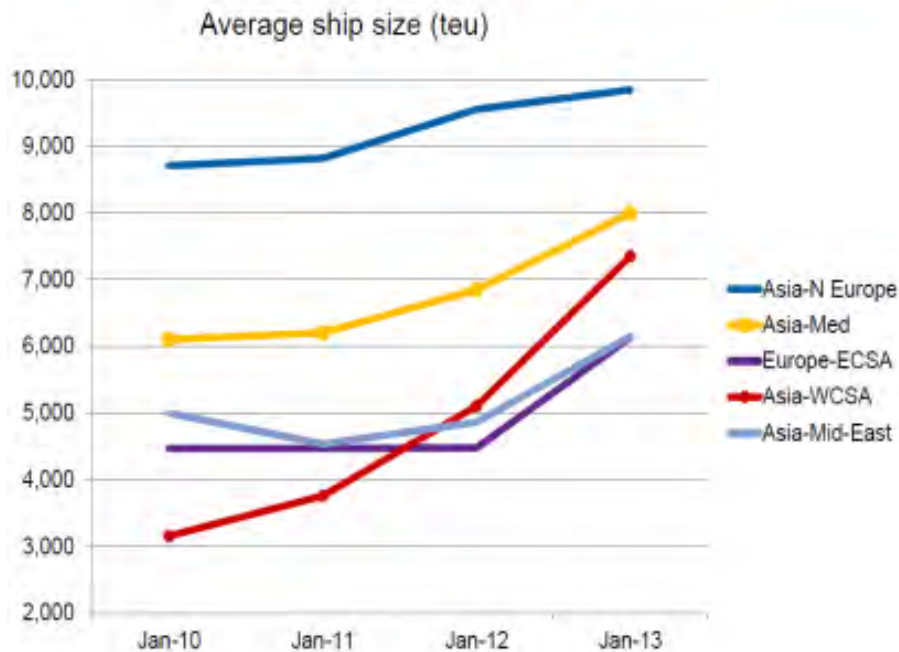
APM TERMINALS

Terminals from all over the world need bigger cranes to handle bigger ships

Africa is experiencing the biggest relative increase

Vessel cascading

Increase in average ship size: 1Q 2013 - 1Q 2015

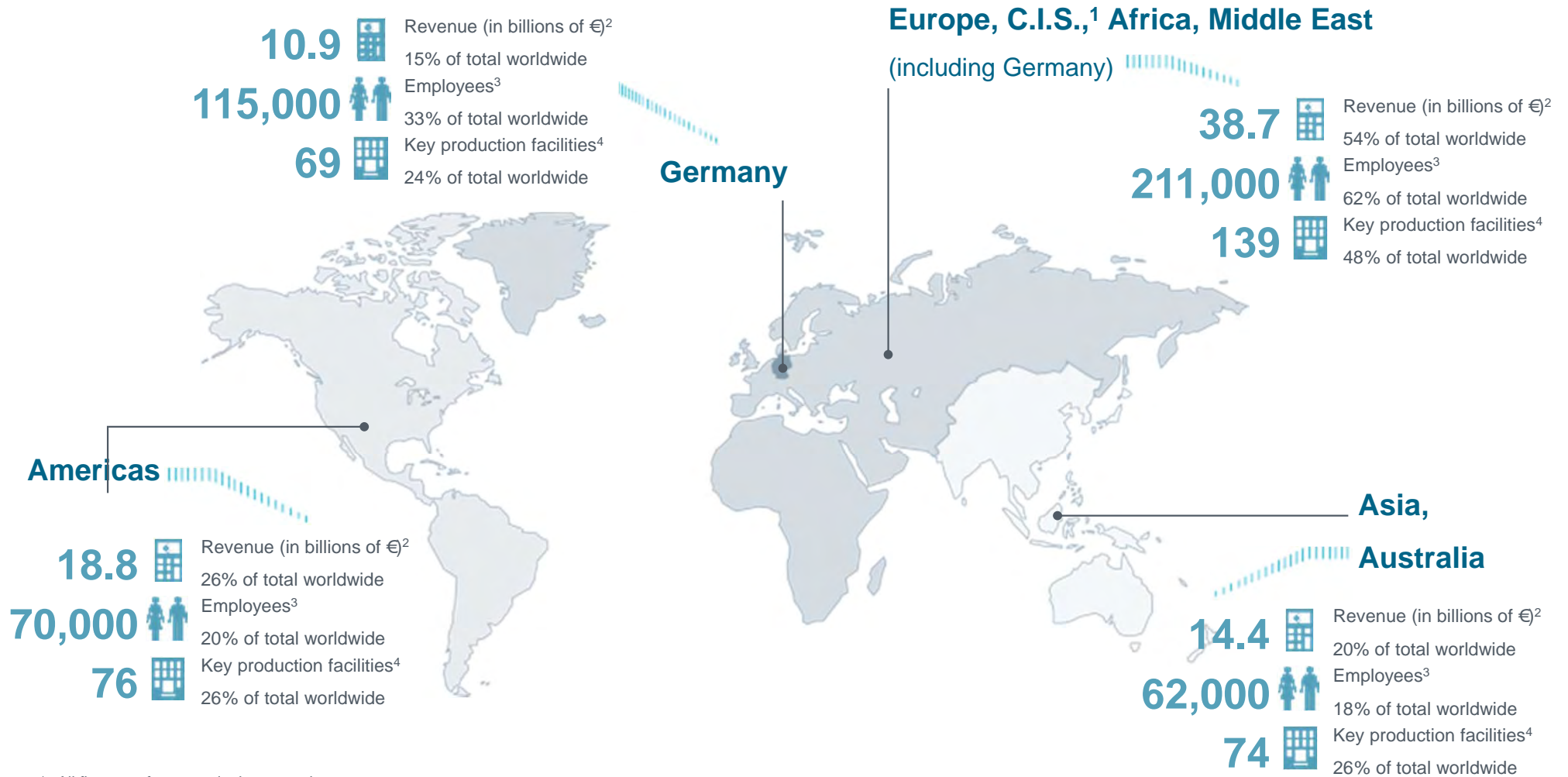| Region	Increase
Europe-S Africa	80%
Asia-ECSA	37%
Asia-W Africa	34%
Europe- W Africa	32%
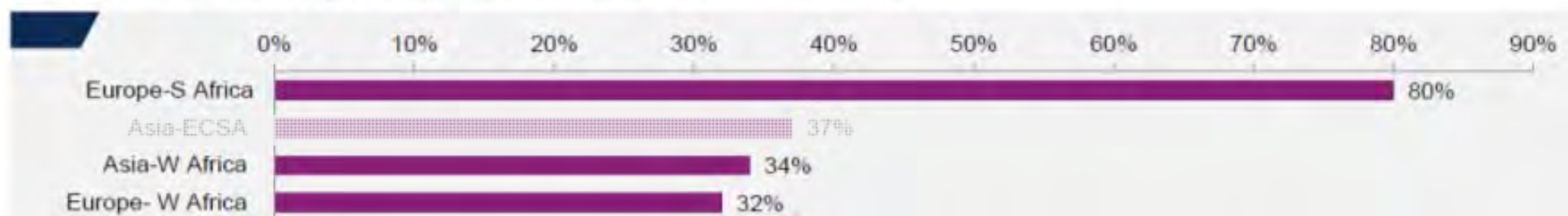
Source: Drewry Maritime Research

- Vessel cascading affects all terminals in the World

- Africa is experiencing the biggest relative increase

- Bigger Ships = Bigger Cranes !!

Siemens – Global presence
Close to customers all over the world

Europe, C.I.S.,[1] Africa, Middle East

(including Germany)

10.9 — Revenue (in billions of €)[2]
15% of total worldwide

115,000 — Employees[3]
33% of total worldwide

69 — Key production facilities[4]
24% of total worldwide

Germany

38.7 — Revenue (in billions of €)[2]
54% of total worldwide

211,000 — Employees[3]
62% of total worldwide

139 — Key production facilities[4]
48% of total worldwide

Americas

18.8 — Revenue (in billions of €)[2]
26% of total worldwide

70,000 — Employees[3]
20% of total worldwide

76 — Key production facilities[4]
26% of total worldwide

Asia, Australia

14.4 — Revenue (in billions of €)[2]
20% of total worldwide

62,000 — Employees[3]
18% of total worldwide

74 — Key production facilities[4]
26% of total worldwide

All figures refer to continuing operations.
1 Commonwealth of Independent States. **2** By customer location. **3** As of September 30, 2014. **4** Fifteen employees or more.

Siemens
Presence in South and East Africa

SIEMENS

Key Facts:

- Present for over 155 years

- Head offices in:

  - Kenya

  - Tanzania

  - Zambia

  - Zimbabwe

  - Mozambique

  - South Africa

- 4x Corporate Offices in ZA

- 5x Manufacturing and Assembly Centers in ZA

Kenya
Park Palace, First Floor, Parklands
Second Avenue, Limuru Road, Nairobi.
+253 020 285 6000

Tanzania
Ohio Street, 7th floor
Aman Place, Dar es Salaam.
+255 22 219 6872/3

Zambia
Elunda Two, 2nd floor, Addis Ababa Roundabout
Co Chicwa Rd/Los Angeles Boulevard,
Rhodes Park, Lusaka. +260 977 834868

Zimbabwe
13th floor, CABS Centre,
74 Jason Mayo, Harare
+27 72 024 7012

Mozambique
Rua dos Desoportistas n° 833,
Predio JAT 5/1 9° Ander, Maputo
+258 21 310 424

South Africa
300 Janadel Avenue,
Halfway House,Gauteng.
+27 11 652 2000

Siemens Cranes
Over 100 Years of Experience

Hamburg 1891

Cranes
Our competence

Automation solutions for Cranes

Ship to shore

Intermodal

Stacking

Bulk handling

Coil handling

Shipbuilding

Steel

Offshore

Siemens Drive Train Portfolio For Cranes

SIEMENS

Inverters | **High Performance Motion**

Drives & Motion Controller
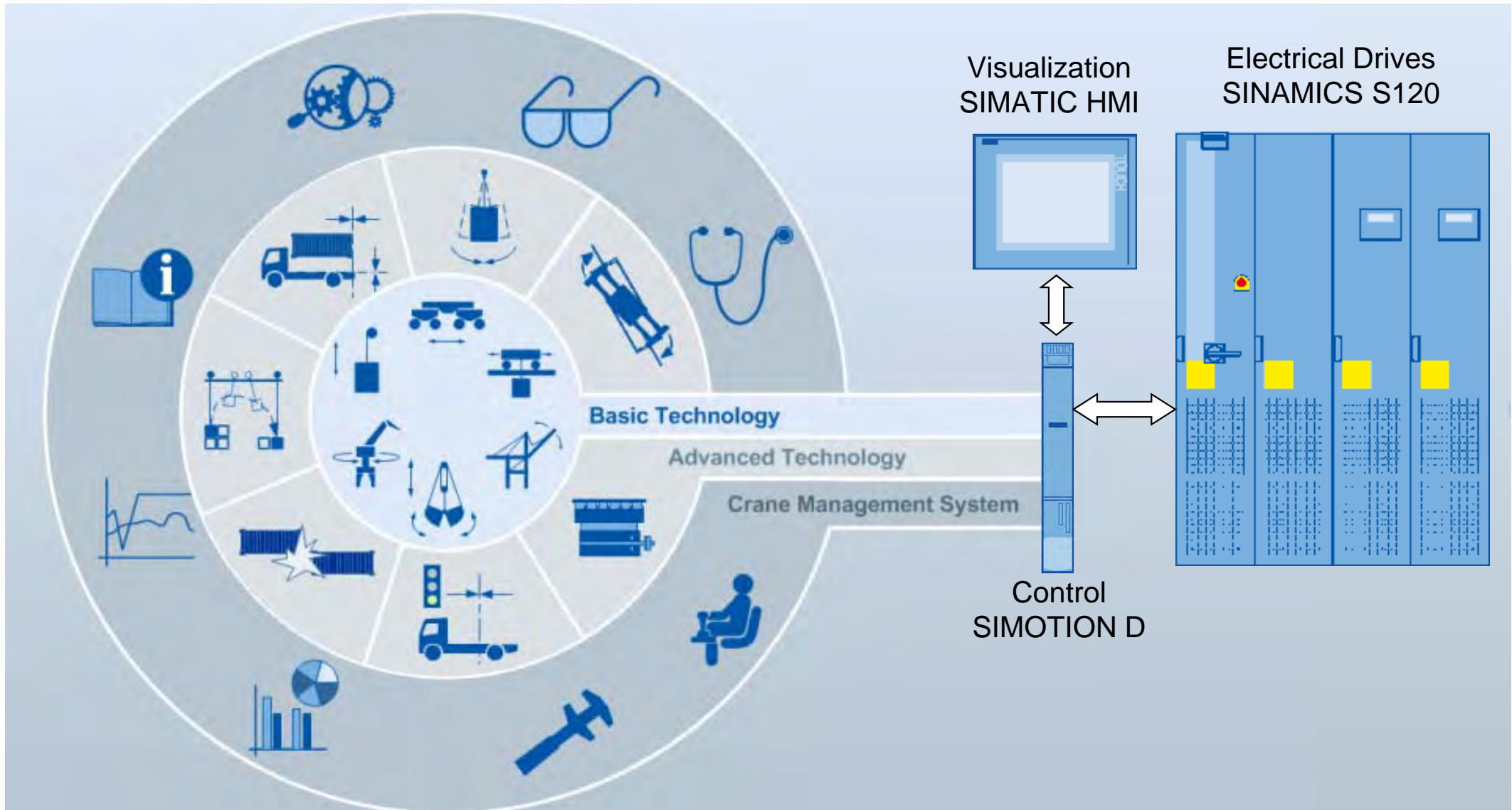
SINAMICS | SIMOTION SIMOCRANE

Motors

LV motors
1LG4 / 1LP4 / 1LA8

Asynchronous servo motors
1PL6
1PH7
1PH8

Gears & Geared Motors

SIMOCRANE Technology
Standardization with a modular software architecture

Visualization
SIMATIC HMI

Electrical Drives
SINAMICS S120

Basic Technology

Advanced Technology

Crane Management System

Control
SIMOTION D

SIMOCRANE with SINAMICS
Multi-axes configuration with AC and DC Technology

SIMOCRANE CMS

HMI Cabin — SIMATIC S7 300F — CMS — SIMATIC ET200

SIMOCRANE

SINAMICS DC Master

SIMOTION D435-2

CU320-2

SINAMICS DC Master

SINAMICS AC Motor Modules

DC BUS

SINAMICS ALM Infeeder

Hoist 1 — Hoist 2 — Trolley — Boom — Gantry 1 — Gantry 2

Siemens standardized crane technology platform SIMOCRANE BT V3.0

Mixed DC & AC drives controlled from a single robust controller in multi-axes configuration

SINAMICS S120

suitable for complex cranes

Integrated full solutions

SIMOCRANE Advanced technology
Sway Control
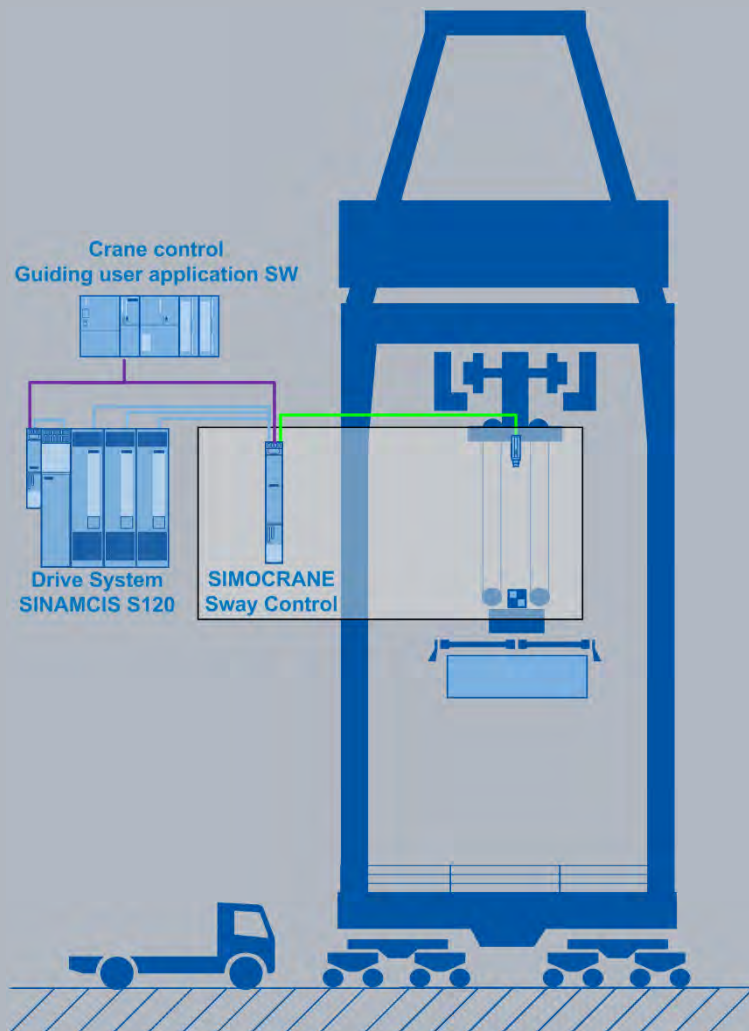
Functions:
- Control of the load sway angle
- Positioning of the load
- (semi) automatic crane operation
- Smooth operation
- Trim, list and skew control

Benefits:
- Control of load trajectory
- Pre-requisite for remote control
- Reduction of the stressing on mechanical transmission elements

Crane control
Guiding user application SW

Drive System
SINAMCIS S120

SIMOCRANE
Sway Control

Typical Semi Automatic operation with Sway Control
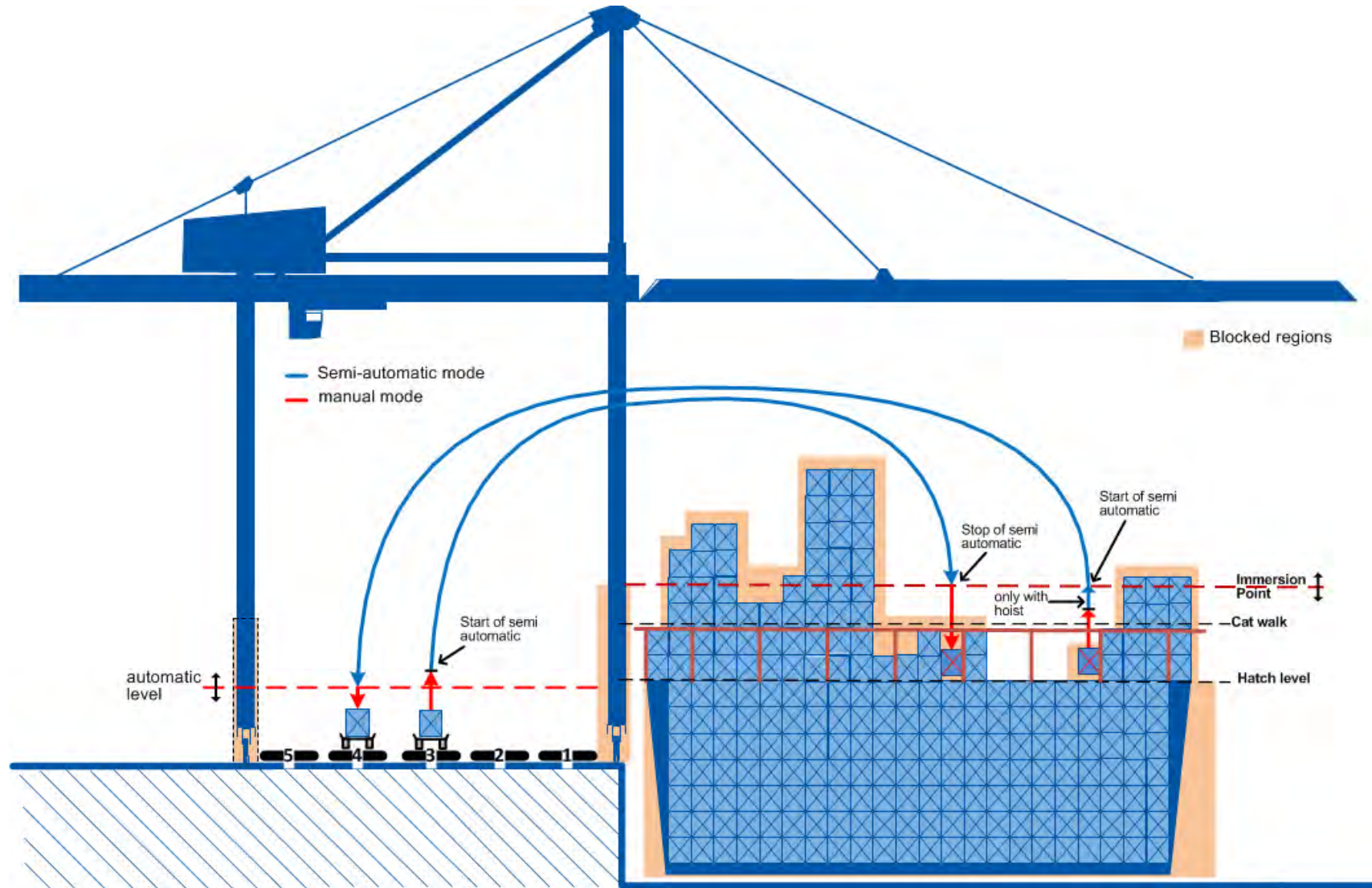
SIMOCRANE Sway Control System
SC Integrated

STS, GSU
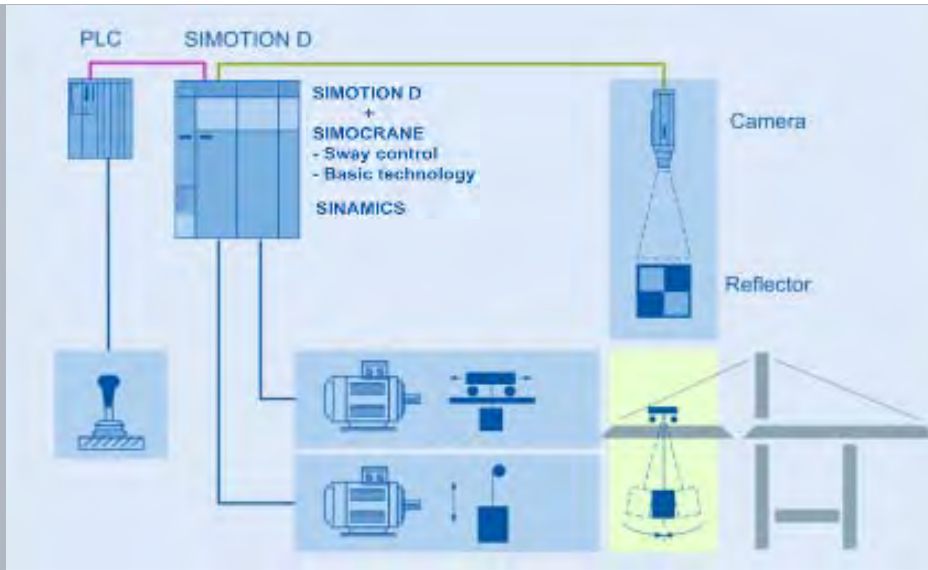
OHBC, Gantry crane
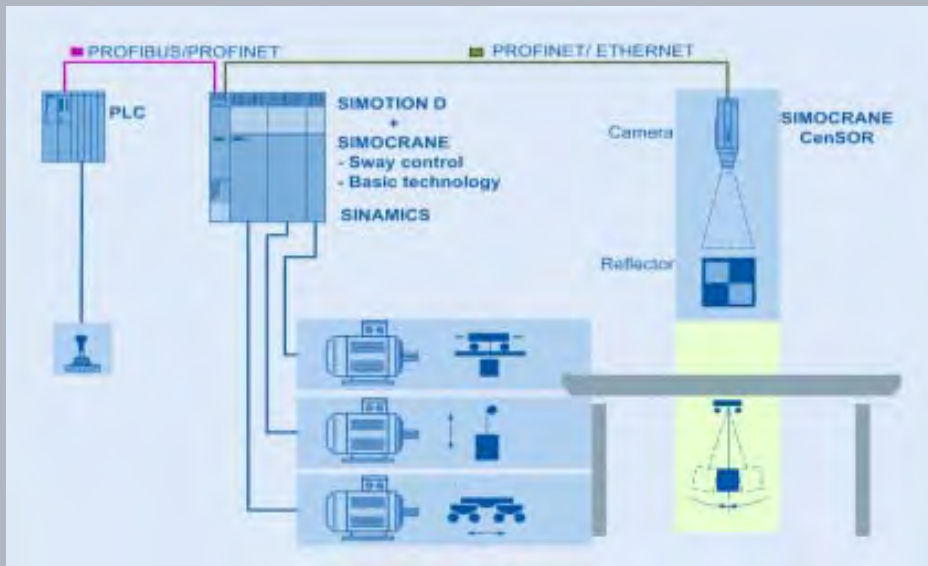
SIMOCRANE SC Integrated

STS, GSU
- Hardware: No (precondition BT)
- Version: V2.0 HF3

OHBC, Gantry crane
- Hardware: no (precondition BT)
- Version V4.2 SP1

Scope of delivery
- Delivery CD (Documentation. SW…….)
- Sway control Licence

# SIMOCRANE Advanced technology
Truck Positioning System (TPS)

Crane contol
Guiding user application SW

Position data
Delta-X (OPC)

SIMOCRANE TPS

Delta-X

Traffic
direction
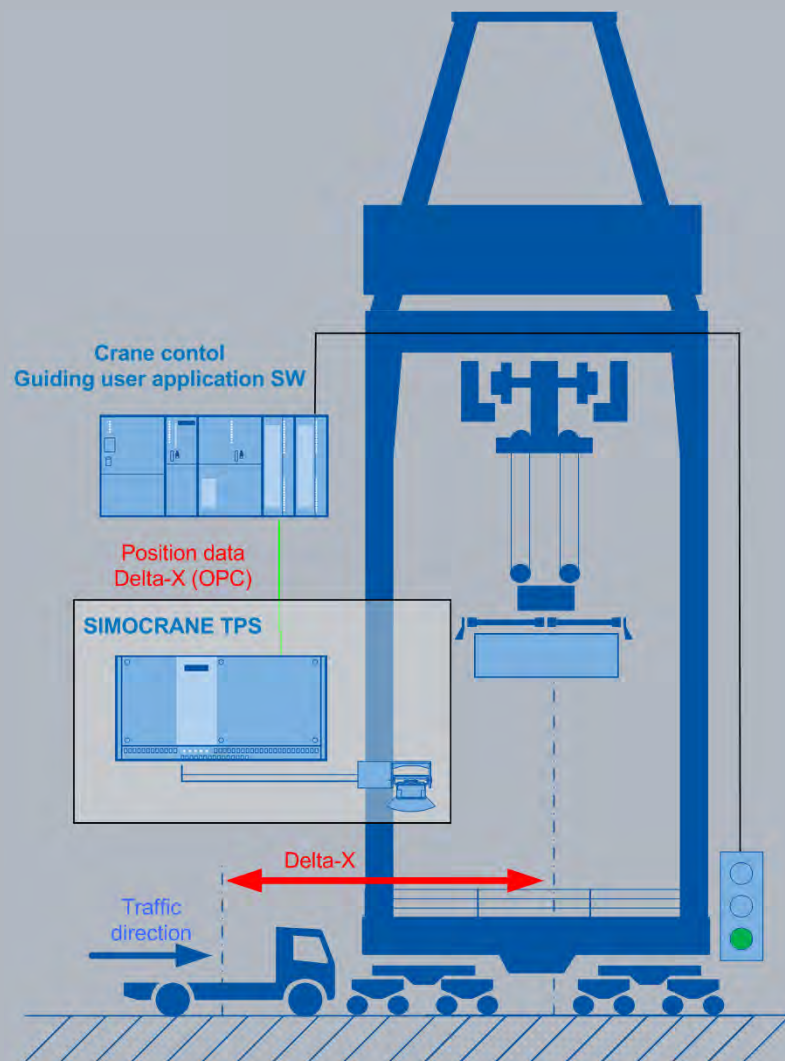
Functions:

- Scan max. 2 working lanes
- Recognize parameterized objects
- Provide high precision position data of parameterized objects in 2D and 3D.
- Automatic system calibration

Benefits:

- Productivity boost (up to 10%)
- Increase safety, less interaction with personnel in the container hand-over zone

SIMOCRANE TPS
Aligning the vehicle/container with the crane
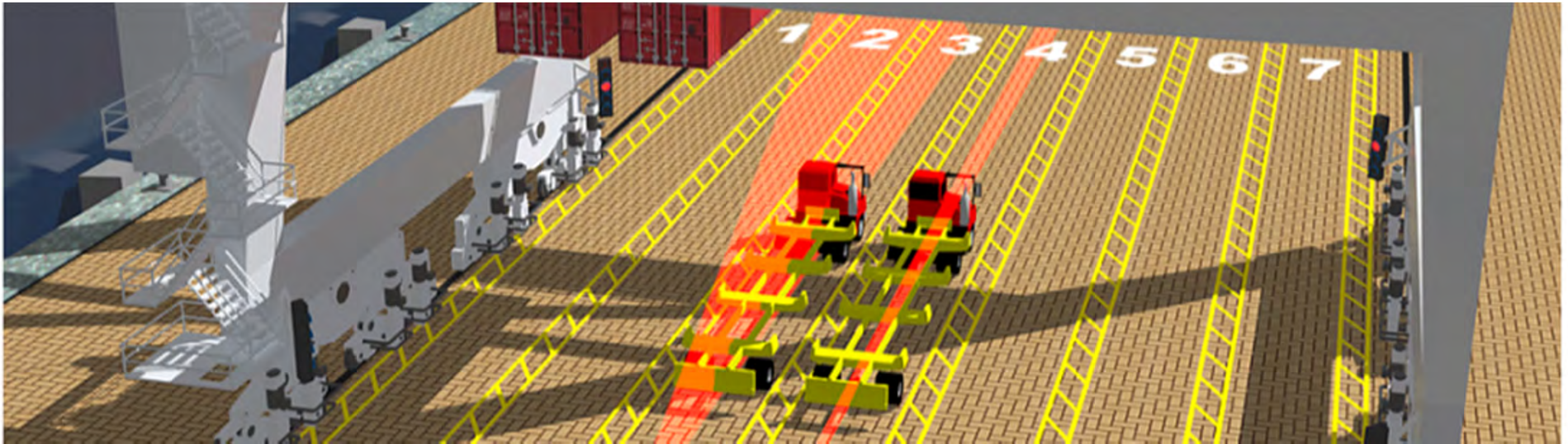
Vehicle alignment (STS)
Vehicle recognition based on 2D model mapping.
(*On the fly measurement*)

Tracking vehicle or ISO container(s) in gantry direction (X), max. 2 lanes simultaneously.
Computing gap between twin 20' containers
Transfer position data (X) to the crane control (PLC) via OPC.
Traffic control via crane control (PLC)

SIMOCRANE CMS
Crane Management System

SIMOCRANE CMS

- Crane Management System from SIEMENS based on SIMATIC WinCC

- Advanced Crane diagnosis

- Playback function

- Condition monitoring

- Retrofitting projects

SIMOCRANE CMS – User Interface

Crane overview

Navigation/Status sub-systems

Error status bar (accumulative error)

Details/Status sub-systems (e.g. drives, motor, brackes, drum, PLC, crane components, etc)

Navigation Main functions

Status bar Operation data

Status technology functions

Actual fault messages

CMS Replay (Playback)
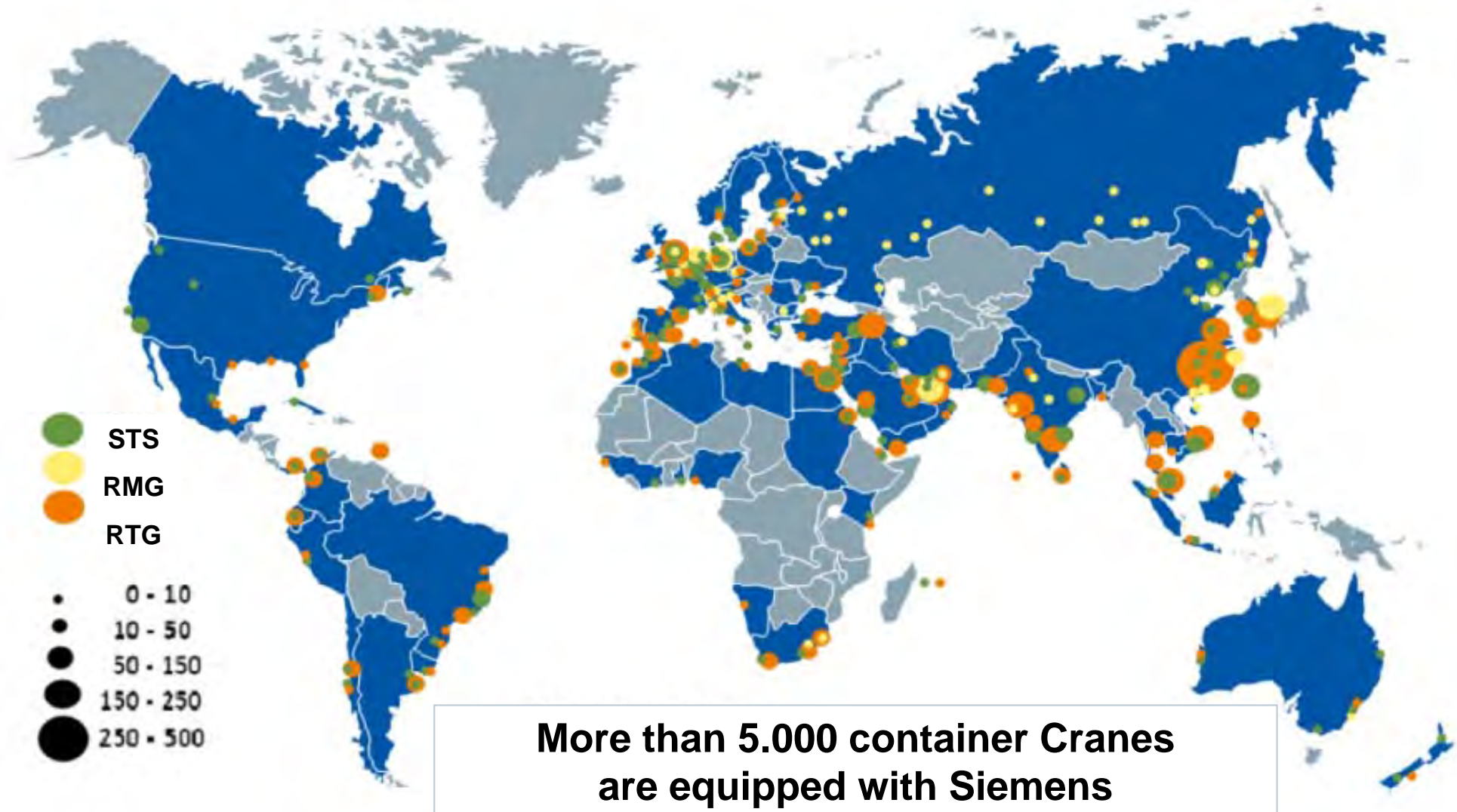
Remote Control Operation System (RCOS)
Higher productivity with STS Remote Control

- Full use of available power for trolley speed and acceleration

- Full use of sway control

- Shift changes quicker and more flexible

- Close to operations

- Better work conditions

- Diversity in operators
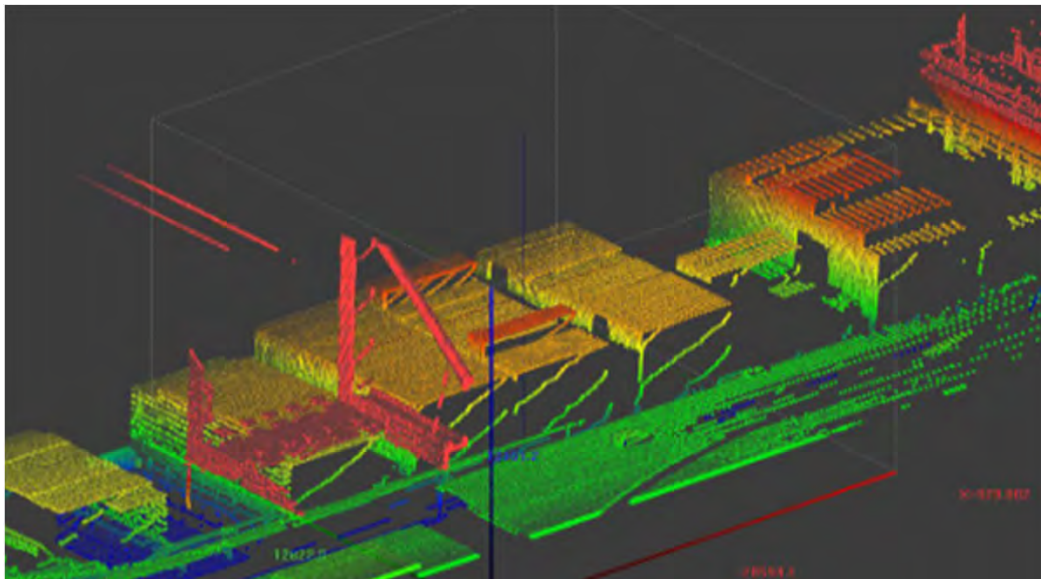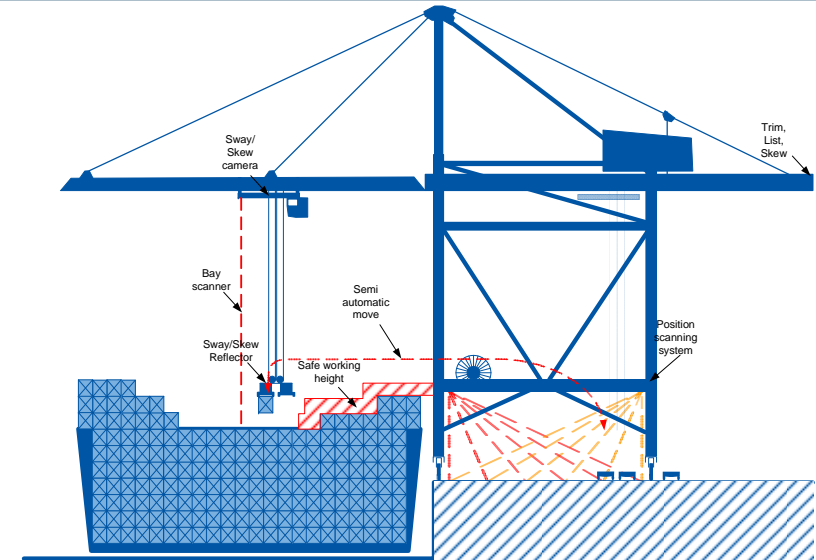
Siemens Cranes
Installed Base - Worldwide

SIEMENS

STS
RMG
RTG

0 - 10
10 - 50
50 - 150
150 - 250
250 - 500

More than 5.000 container Cranes are equipped with Siemens

Siemens Cranes
Installed Base – Africa

SIEMENS

Key facts Africa:

Higher, larger and longer Cranes brought into operation
- Vessel cascading effect

New and modernized terminals are STS operated
- Higher productivity required

Installed Base:
- over 100x Siemens equipped STS handle quay operations
- Harbour Cranes installed base as per locations on map

Half of these Cranes were ordered in the last 5 years
- Local Service presence
- Local know-how and repair capabilities
- Support from the Global Siemens Service Network

- QSG
- RMG
- RTG

- 0 - 9
- 10 - 49
- 50 - 150
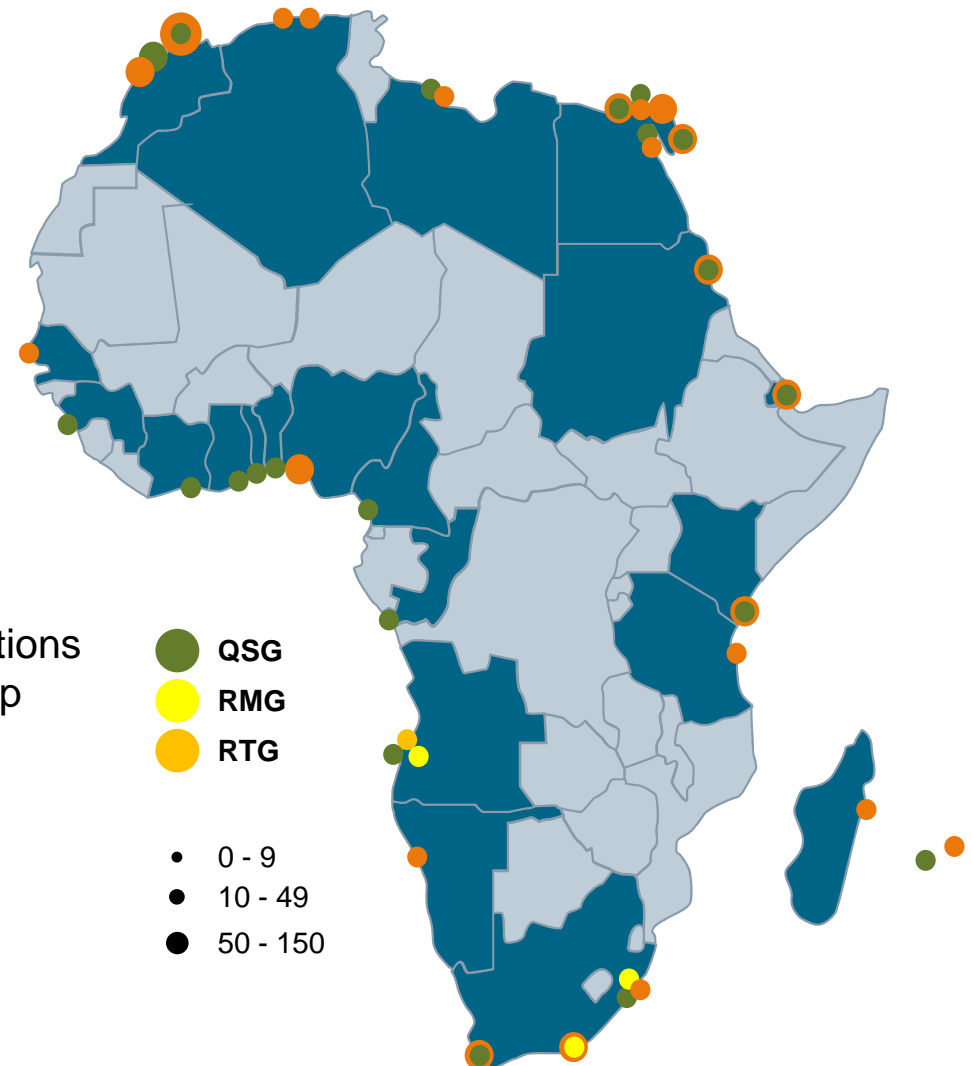
Siemens Cranes
Proven experience and competence

SIEMENS

More than 100 years of experience in Cranes

Technical Competence in Crane Automation

Local presence in more than 190 countries

Largest installed base

State of the art Crane products and systems

Project execution Competence

Thank you!

Pay us a visit

at <u>Stand 28</u>

Luis Cabrita

Business Development Africa

Siemens Cranes

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E-Mail: luis.cabrita@siemens.com