

# Modernization

Life cycle management for drive, control and automation systems in port equipment

7<sup>th</sup> Mediterranean Ports & Shipping 2019

Presenter: Abdessalam El Azzouzi

# Contents

**1** Worldwide installed base

---

**2** Market & technology status

---

**3** Modernization concept

---

**4** Productivity improvement

---

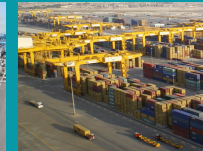
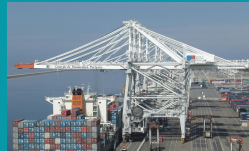
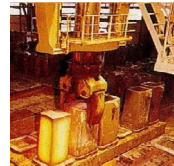
**5** Risk analysis, Essential modifications and CE-marking

---

**6** Take away

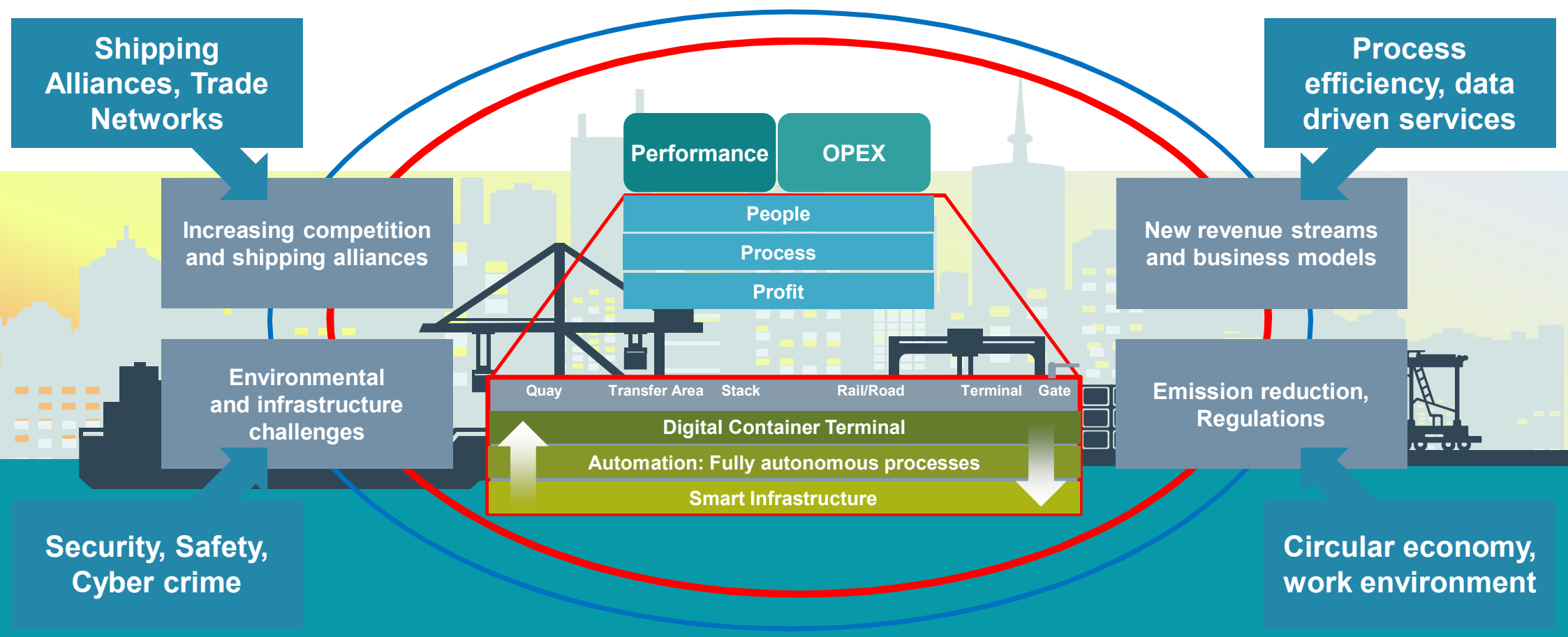
# 1. Terminal: big ship, STS double trolley, truck, RTG, stack, AGV, train, shuttle carrier

**SIEMENS**  
*Ingenuity for life*



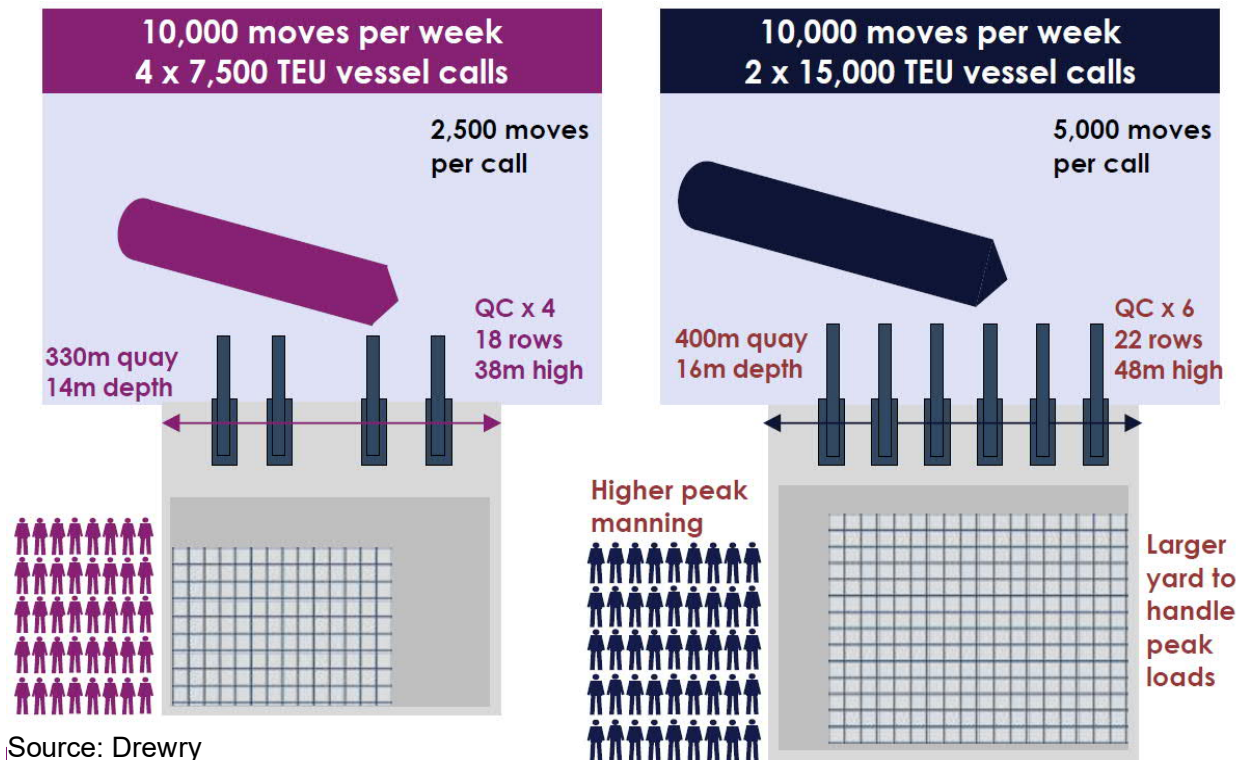
# 1. Terminal: big ship, STS double trolley, truck, RTG, stack, AGV, train, shuttle carrier

**SIEMENS**  
*Ingenuity for life*



# Supersized vessels result in peak loads on terminals

## Terminals: invest or be obsolete?

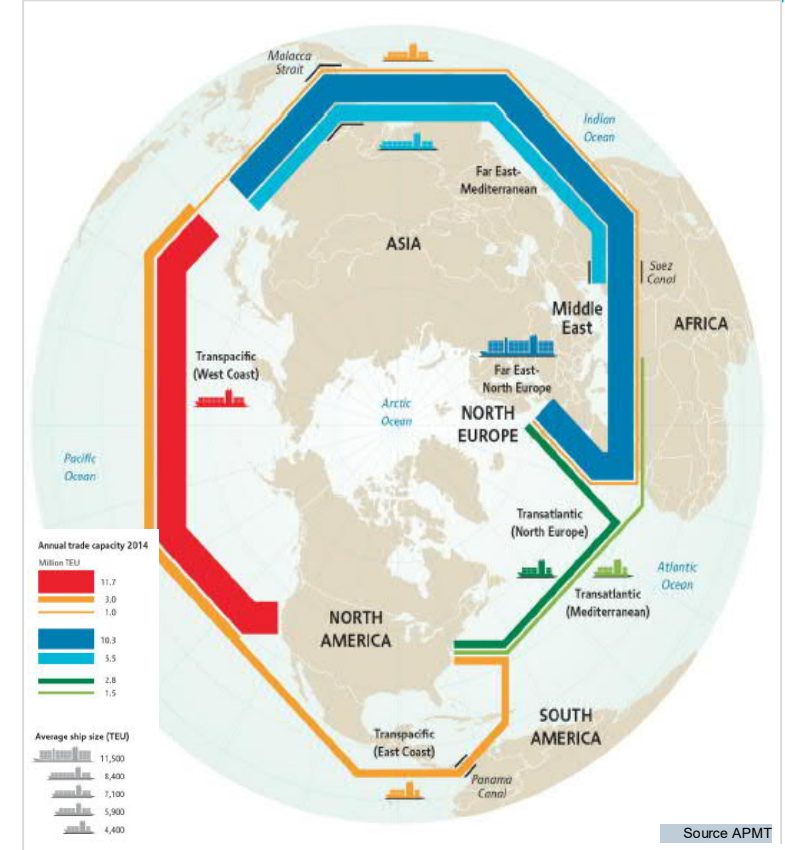


Source: Drewry

Restricted © Siemens AG 2019

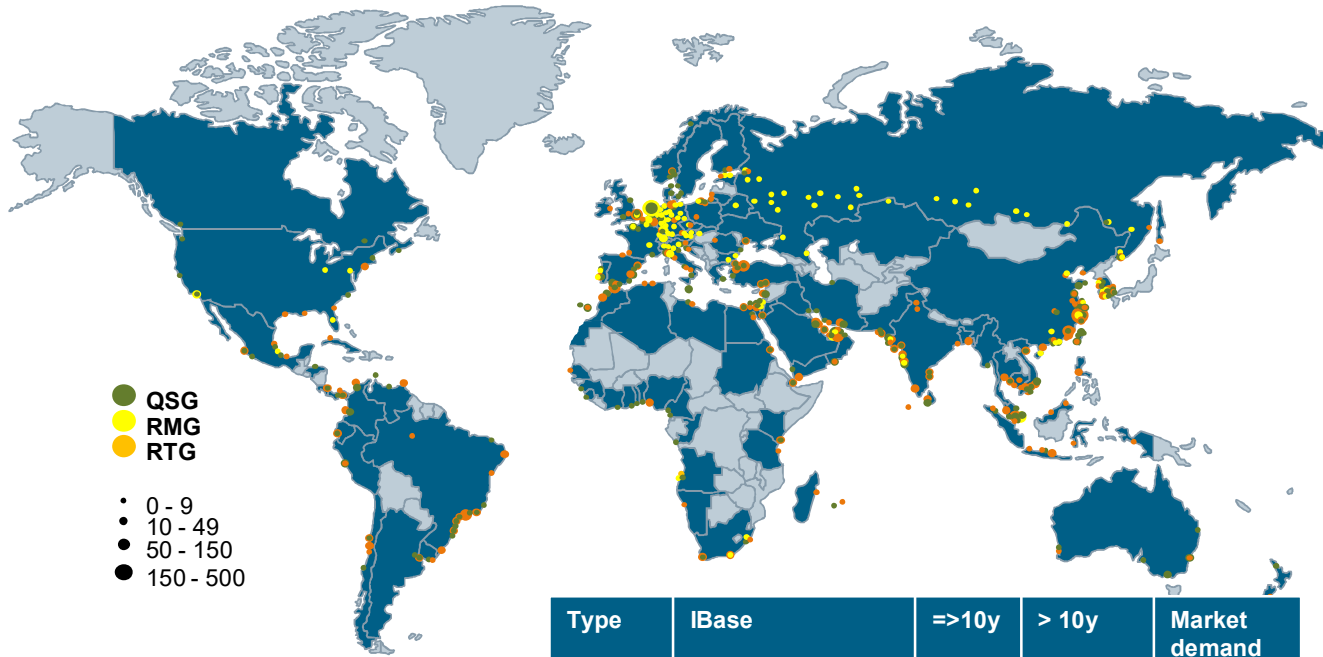
Page 5

## Terminals: all in or fault?



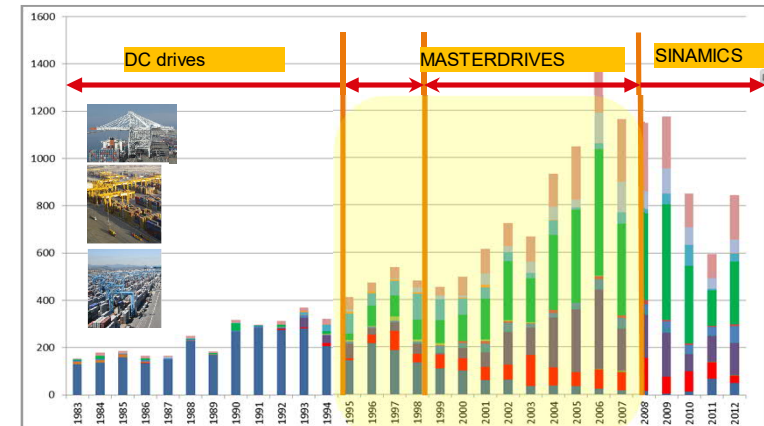
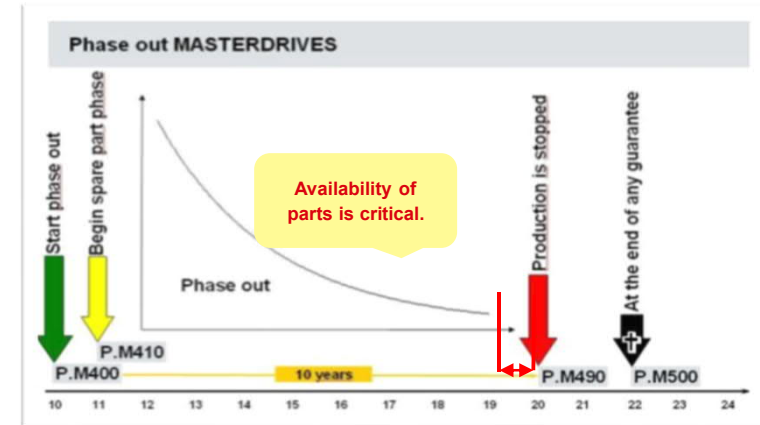
A. El Azzouzi / DI MC GMC CRANES

# 1. Worldwide installed Base



Type	IBase	=>10y	> 10y	Market demand
<b>Total</b>	<b>21.544</b> (>5.500 Siemens)	<b>8.682</b>	<b>40%</b>	↑
STS	6.564	2.326	35%	↑
RMG	3.280	1.782	54%	↑
RTG	11.700	4.574	39%	↑

**SIEMENS**  
Ingenuity for life

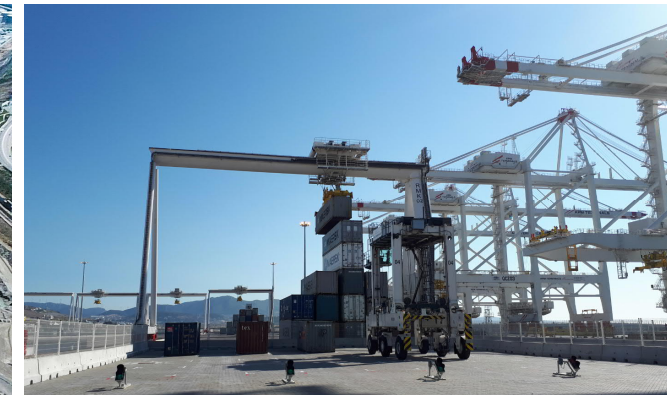
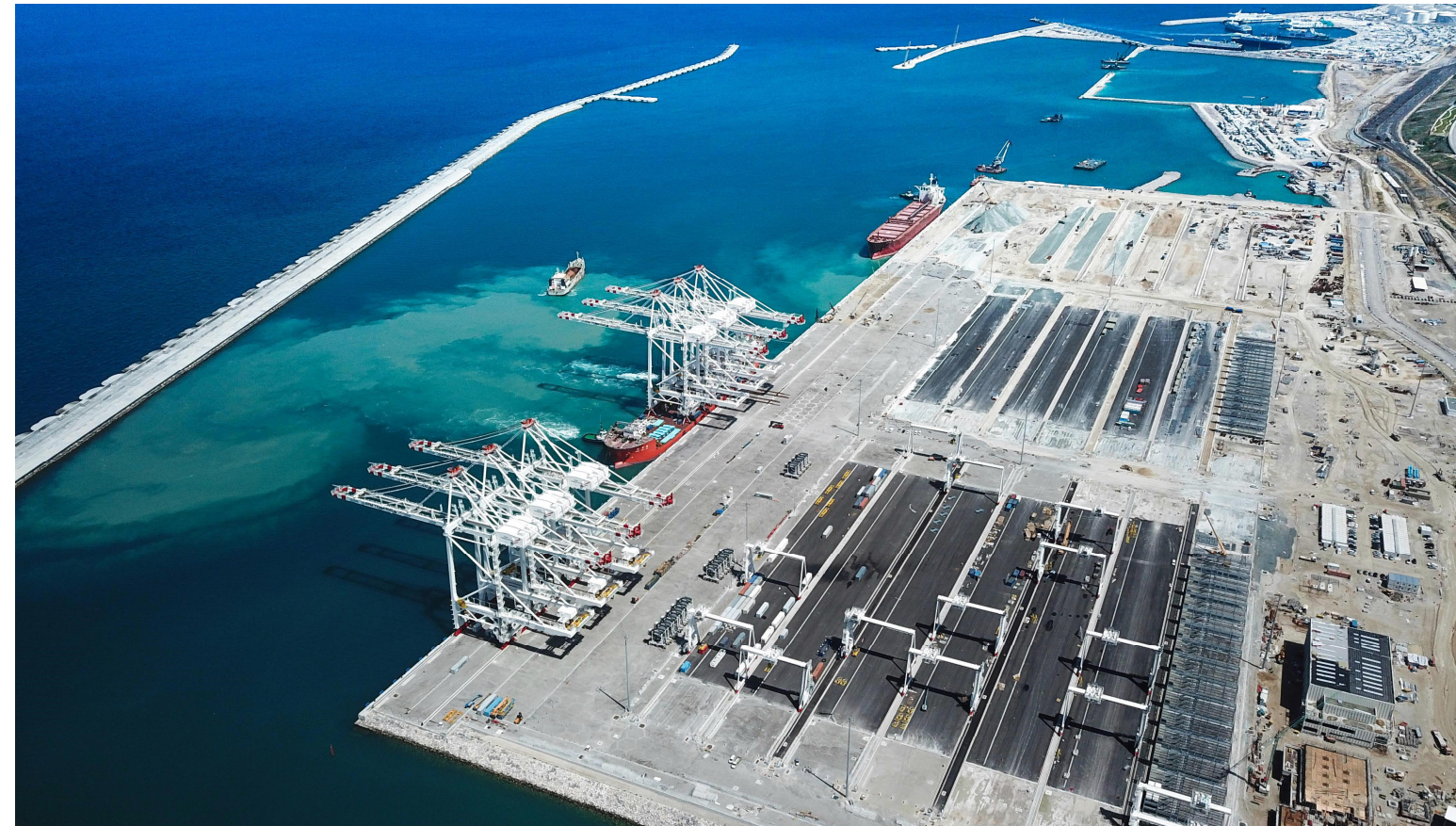


Source: Siemens CRANES IBase 2015

# APMT Tanger Med II

## Reference - Automatic Stacking Cranes

**SIEMENS**  
*Ingenuity for life*



# Simulation

## SIMOCRANE Simulation

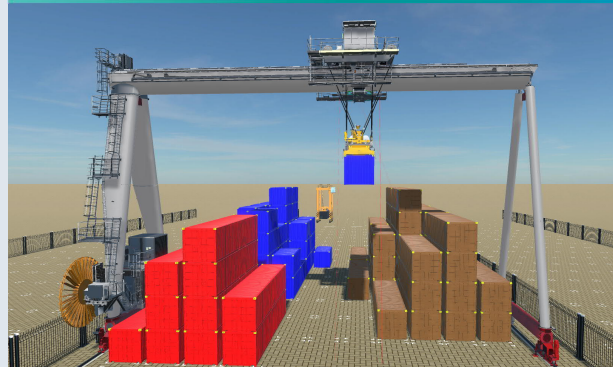
**SIEMENS**  
*Ingenuity for life*

### Virtual Model



- ✓ Availability
- ✓ Flexibility

### Digital Twin



- ✓ Pre Commissioning Tool
- ✓ Virtual Test Environment
- ✓ Training platform

### Logistics



- ✓ Simulation Horizontal Transport
- ✓ Block Management System



# Digital Twin

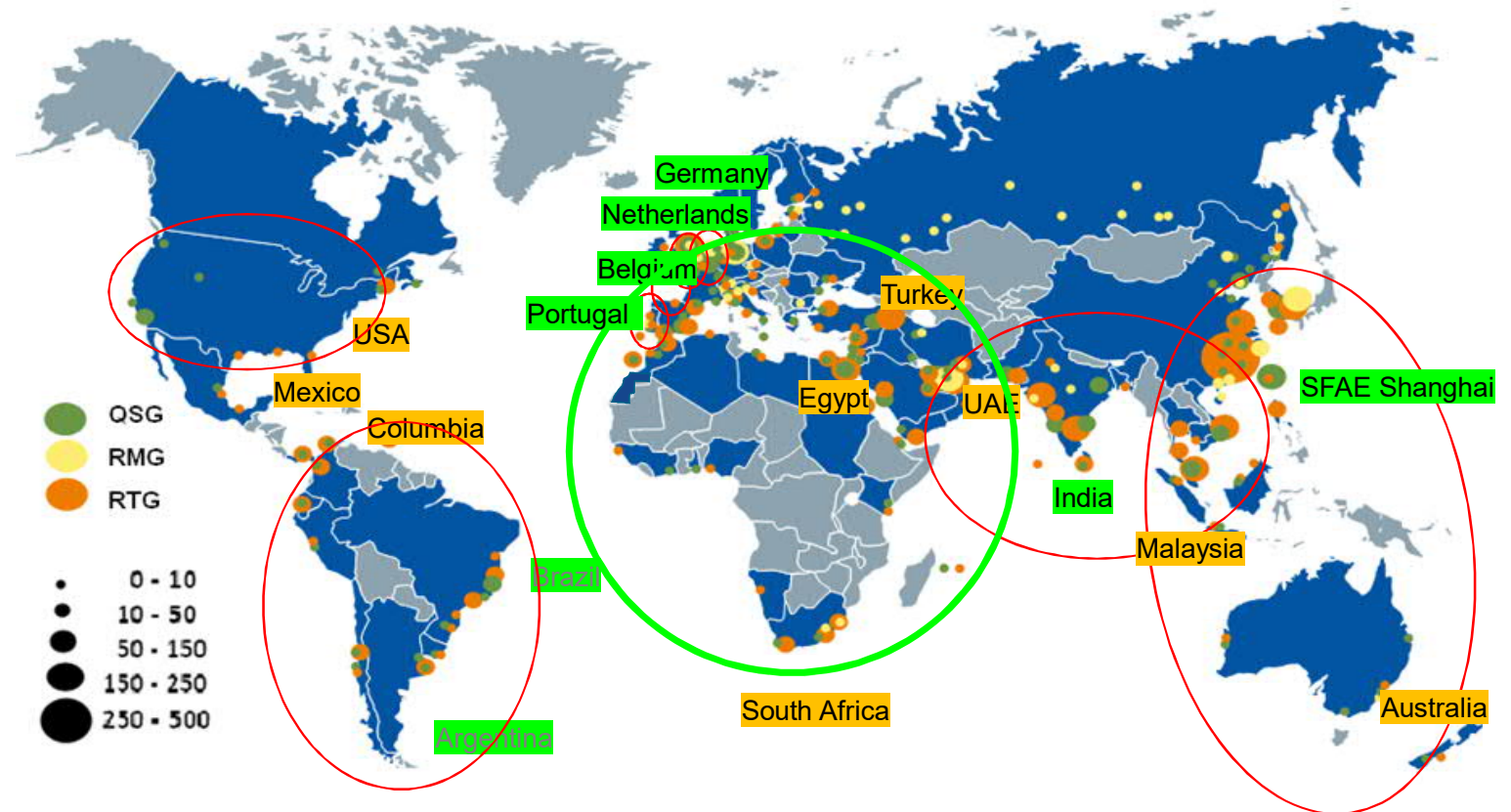
Virtual Crane adheres to real World behaviour



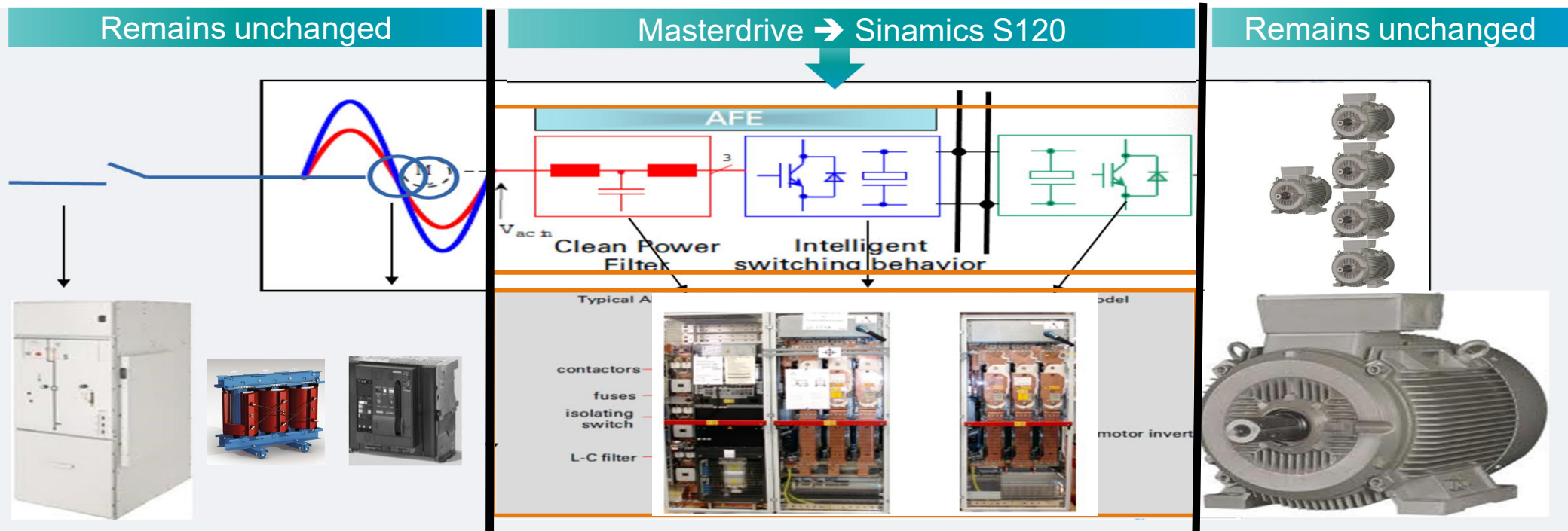
## 2. Siemens RCs w. capabilities for new & modernization proj.

### Modernization skills:

- Siemens Regional centers
- Certified partners



### 3. Replace Masterdrives by Sinamics



- Replace Masterdrives- by Sinamics S120 chassis – comparable power, voltage and current rates
- All other main drive parts; MV-switchgear, transformer, ACBs, motors, external cabling, etc.. remain.
- Hardwired emergency/safety circuit and PLC software remains unchanged
- Motor accelerations and speeds remains unchanged
- ➔ **Upgrades MD to S120 should not be regarded as a major modifications vs. VDI4449 categorizes as major modernization**

## 4. Harbor modernization from 6SE70 to 6SL33

**SIEMENS**  
*Ingenuity for life*



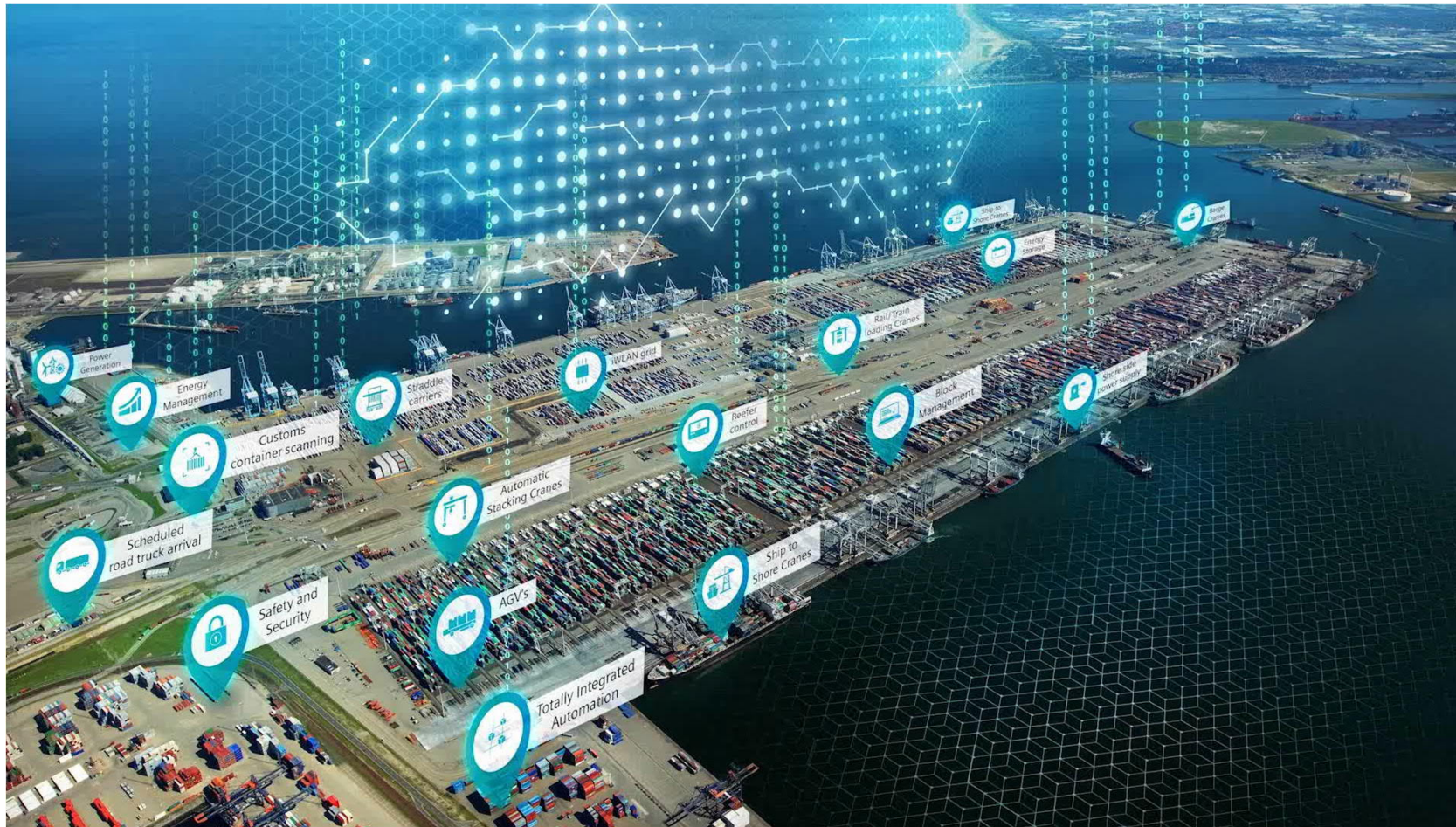
Restricted© Siemens AG 2019

Page 12

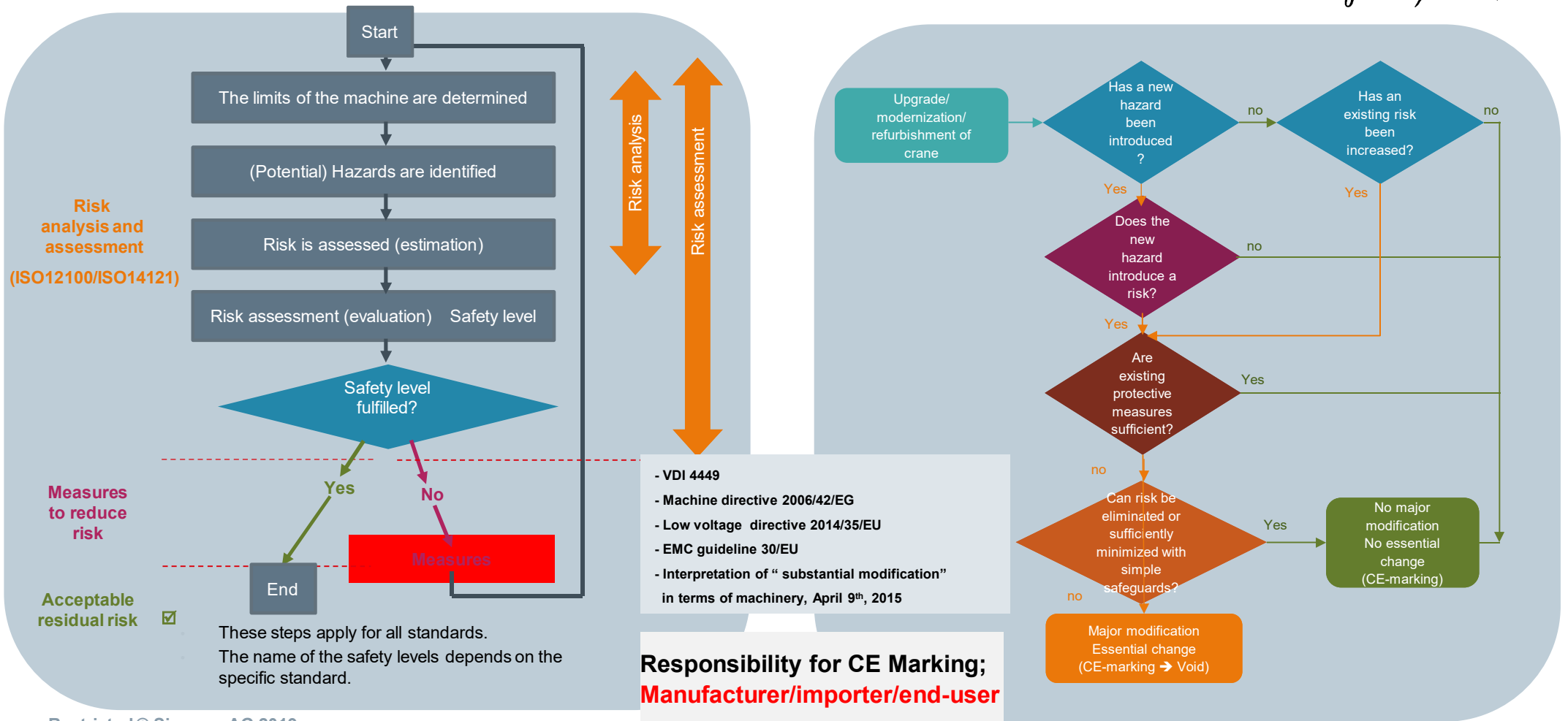
A. El Azzouzi / DI MC GMC CRANES

## 4. Harbor modernization from 6SE70 to 6SL33

**SIEMENS**  
*Ingenuity for life*



# 5. Standards: Risk Analysis and Assessment



## 6. Take away



**Prod. New cranes  
flatness**



**Increasing demand  
for modernization  
(Brownfield)**



**RTG electrification  
STS mechanical &  
Electrical upgrade**



**Applicable  
norms**



**Risk analysis -  
always**



**CE-marking – pay  
attention!**



**Added value by  
automation  
(TPS, LCPS,  
RCOS....)**



**Added value by  
digitalization**  
(Services; predictive  
maintenance, vibration  
analysis, remote services,  
... )



**Full project data  
Installed Base**



**Work together with  
local Siemens**

Thank you for your attention

**SIEMENS**  
*Ingenuity for life*



**Abdessalam El Azzouzi**

Digital Industries  
MC GMC Cranes

Frauenauracher str. 80  
91056 Erlangen  
Germany - Siemens AG

Mobile: + 31 6 558 448 39

E-mail: [abdessalam.el.azzouz@siemens.com](mailto:abdessalam.el.azzouz@siemens.com)

[www.siemens.com/cranes](http://www.siemens.com/cranes)