- Brief about Cavotec Group
- Focus on ports - Automation
- Brief introduction to MoorMaster™ and ShorePower

CAVOTEC

Cavotec year by year

1974
- ✓ Incorporation of Specimas AB, Sweden.

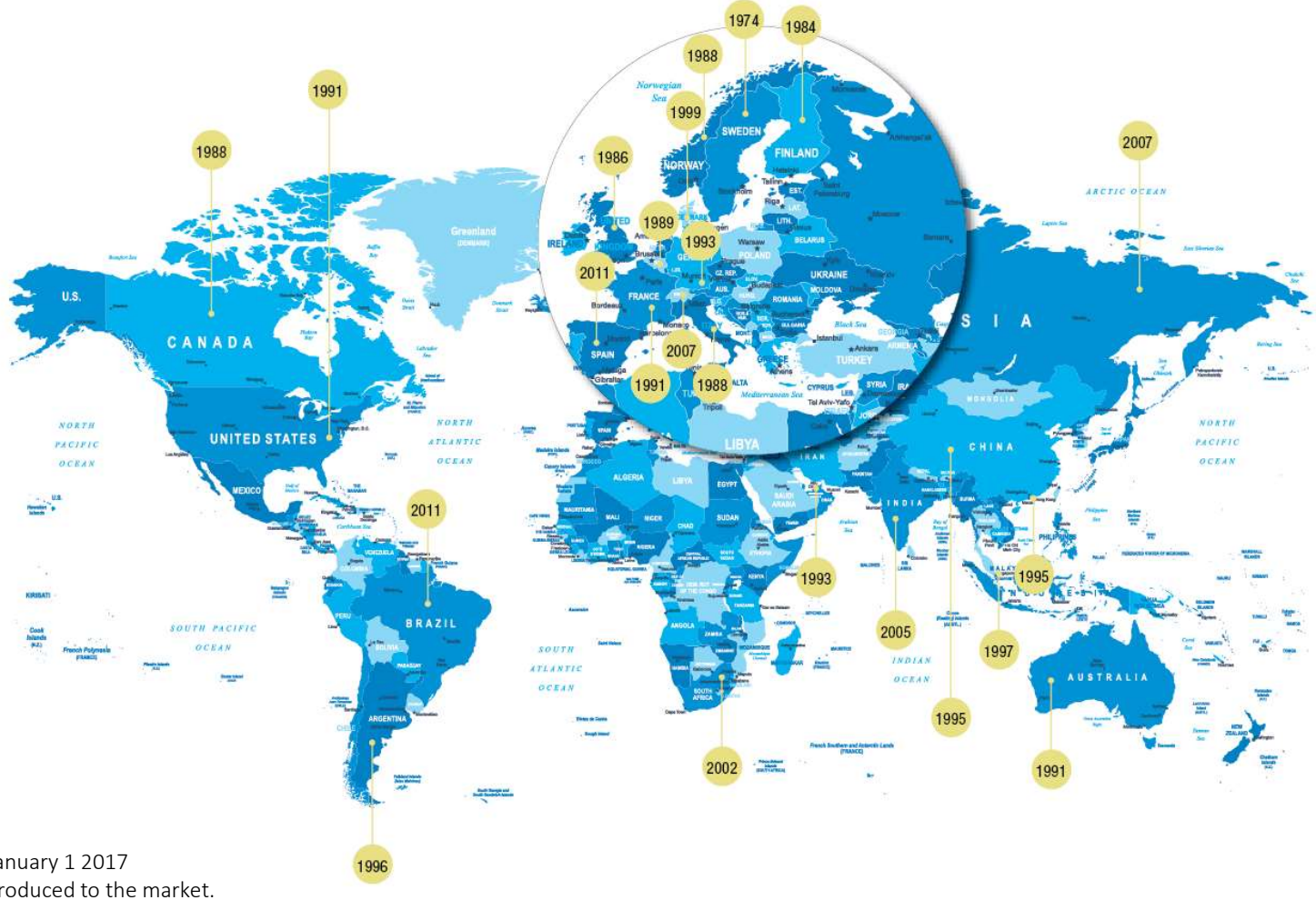
1984
- ✓ Acquisition of Specimas SpA, Italy.

1995-2000
- ✓ Acquisition of Alfo Apparatebau GmbH, Germany.
- ✓ Acquisition of Metool Pty Ltd., Australia

2000-2005
- ✓ Acquisition of Fladung GmbH, Germany.
- ✓ Cavotec Group and Mooring Systems Ltd. sign sales agreement.
- ✓ Acquisition of Micro-control AS, Norway.

2005-2010
- ✓ Listing of Cavotec MSL on the New Zealand Stock Exchange.
- ✓ Acquisition of the Dabico Group in US and UK.
- ✓ Acquisition of Meyerinck GmbH, Germany.

2010-2015
- ✓ Acquisition of Inet Group in the US.
- ✓ Cavotec SA listed on NASDAQ OMX Stockholm.
- ✓ Acquisition of Combibox in Sweden.

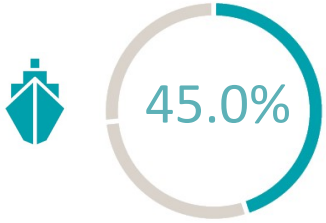


2016
- ✓ Cavotec's Strategic Plan was prepared ahead of its introduction on January 1 2017
- ✓ The Group's innovative Series 2500+ power unit was successfully introduced to the market.
- ✓ Completion of At Sea Demonstrations of the US Navy's Advanced Mooring System with Cavotec's MoorMaster™.

Highlights FY16 (000's)

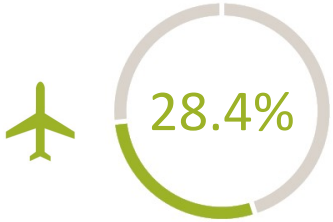
A tailored approach for our business and market sectors

Ports & Maritime

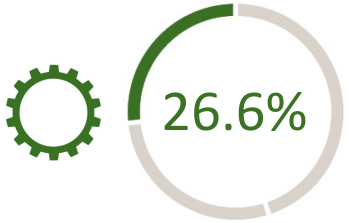


EUR 95,094

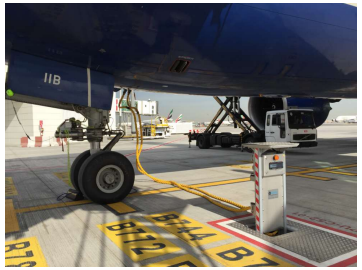
Airports & Industry



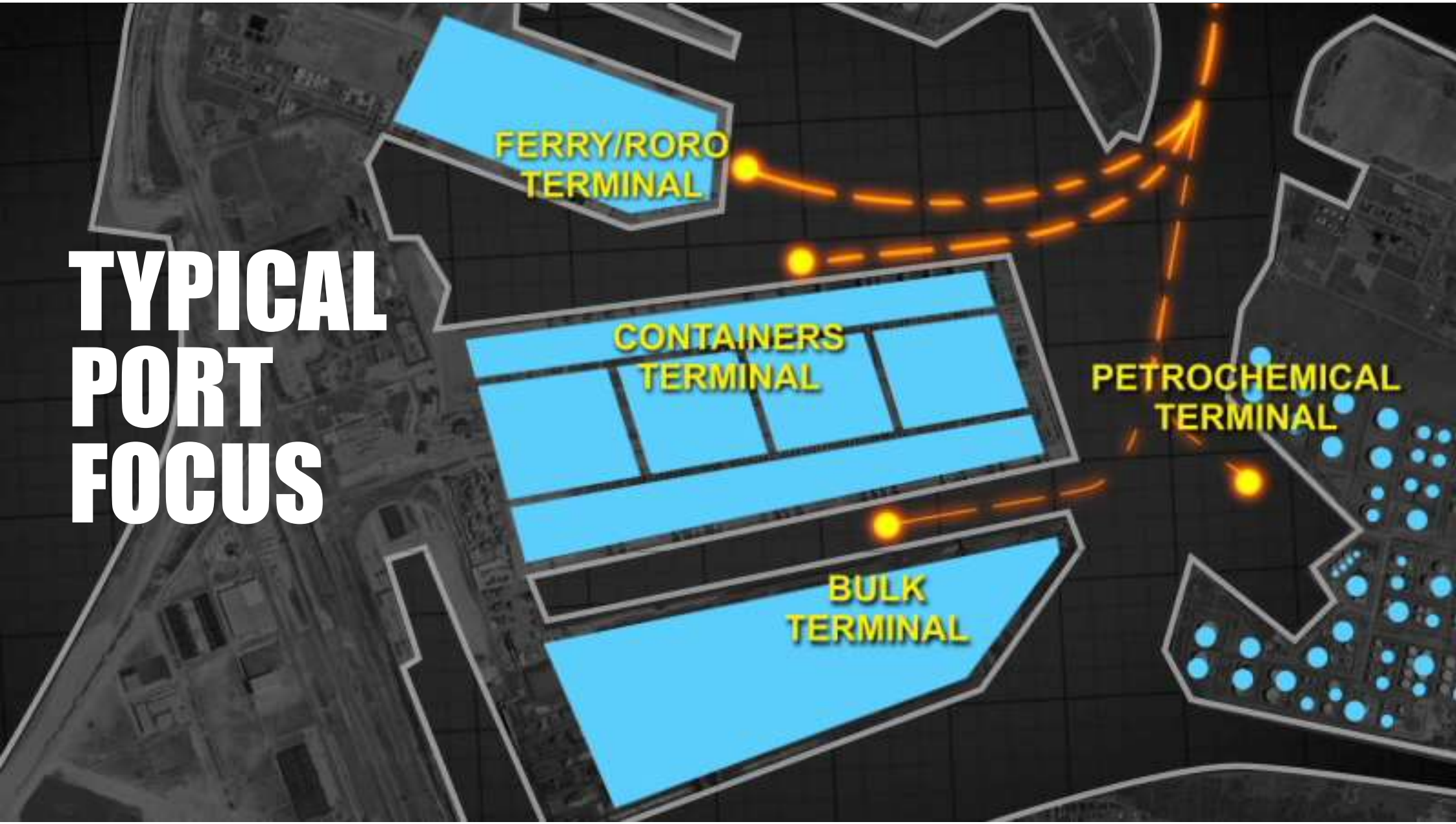
EUR 60,040



EUR 56,384

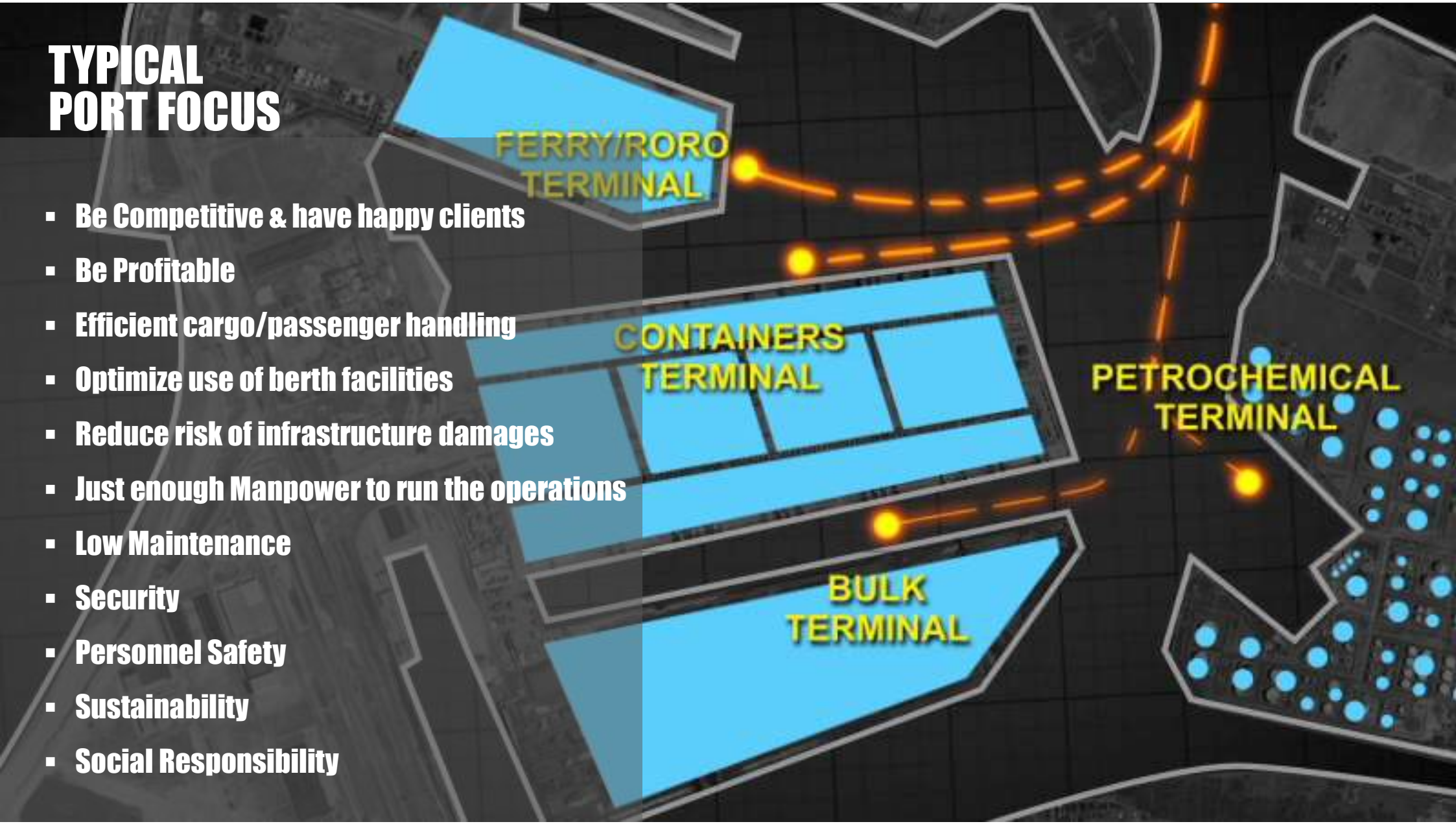


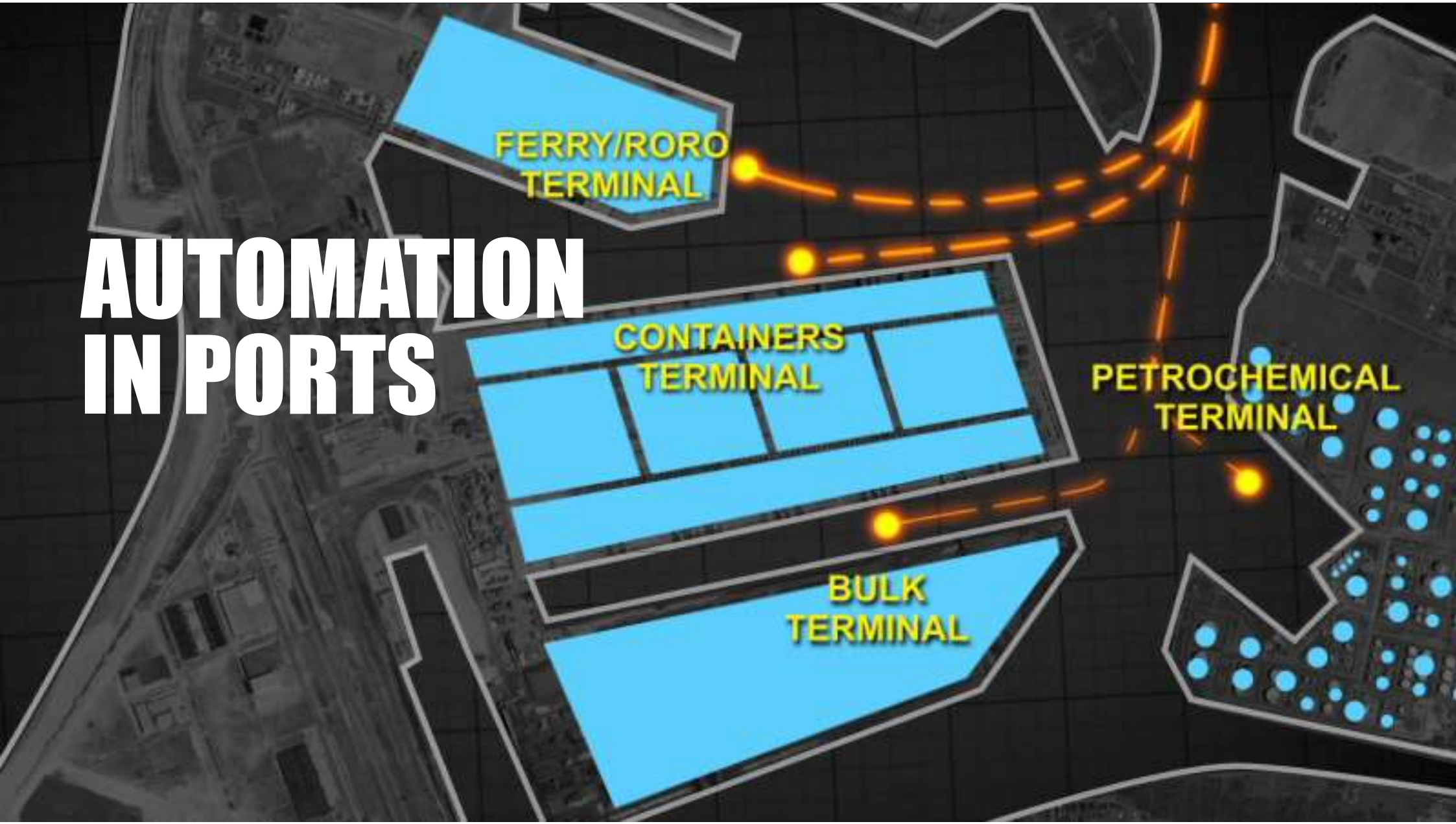
Ports & Maritime Airports Industry

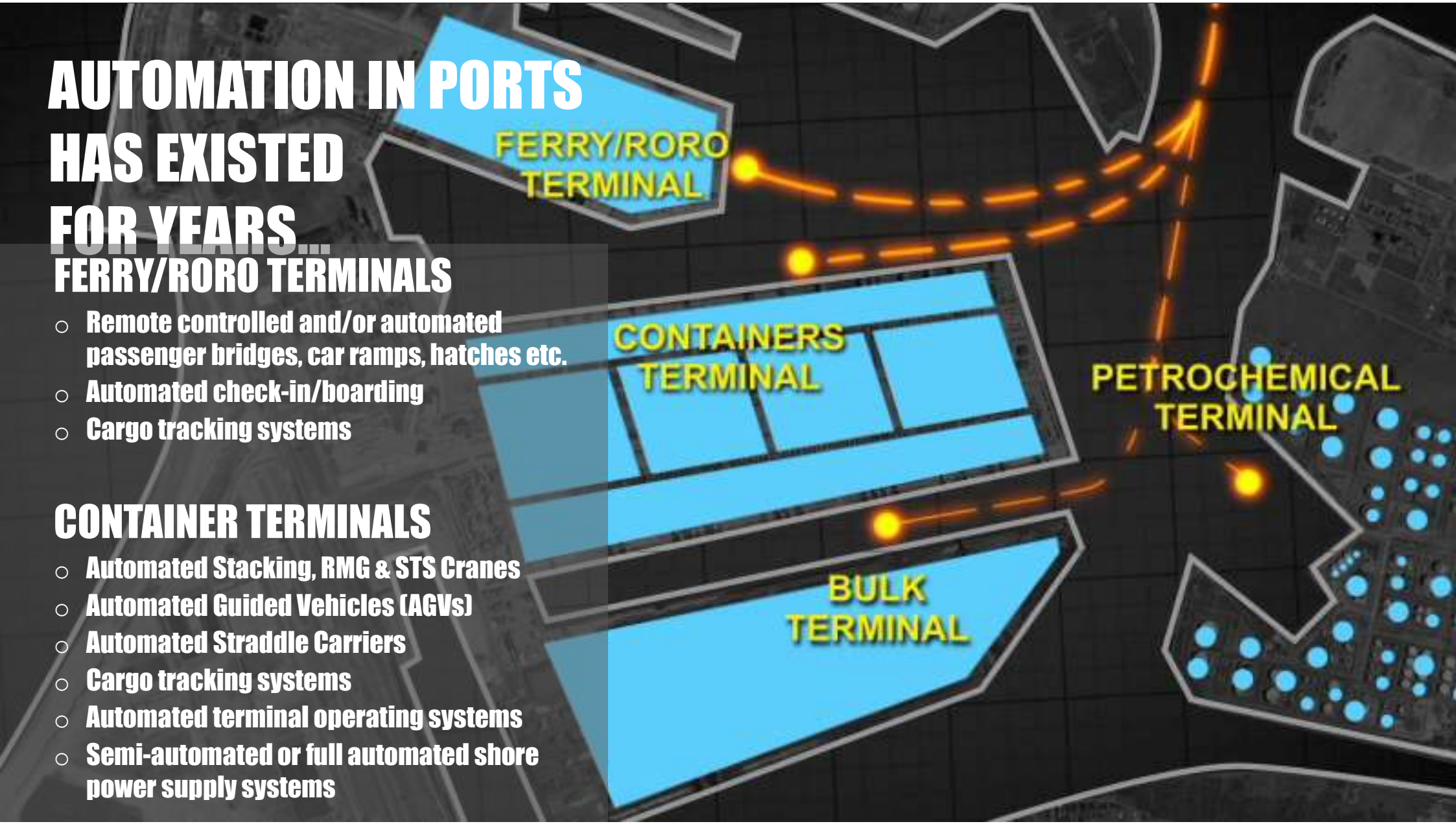

TYPICAL
PORT
FOCUS
FERRY/RORO
TERMINAL
CONTAINERS
TERMINAL
PETROCHEMICAL
TERMINAL
BULK
TERMINAL

TYPICAL PORT FOCUS

- Be Competitive & have happy clients
- Be Profitable
- Efficient cargo/passenger handling
- Optimize use of berth facilities
- Reduce risk of infrastructure damages
- Just enough Manpower to run the operations
- Low Maintenance
- Security
- Personnel Safety
- Sustainability
- Social Responsibility




AUTOMATION
IN PORTS
FERRY/RORO
TERMINAL
CONTAINERS
TERMINAL
PETROCHEMICAL
TERMINAL
BULK
TERMINAL



AUTOMATION IN PORTS HAS EXISTED FOR YEARS...

FERRY/RORO TERMINALS

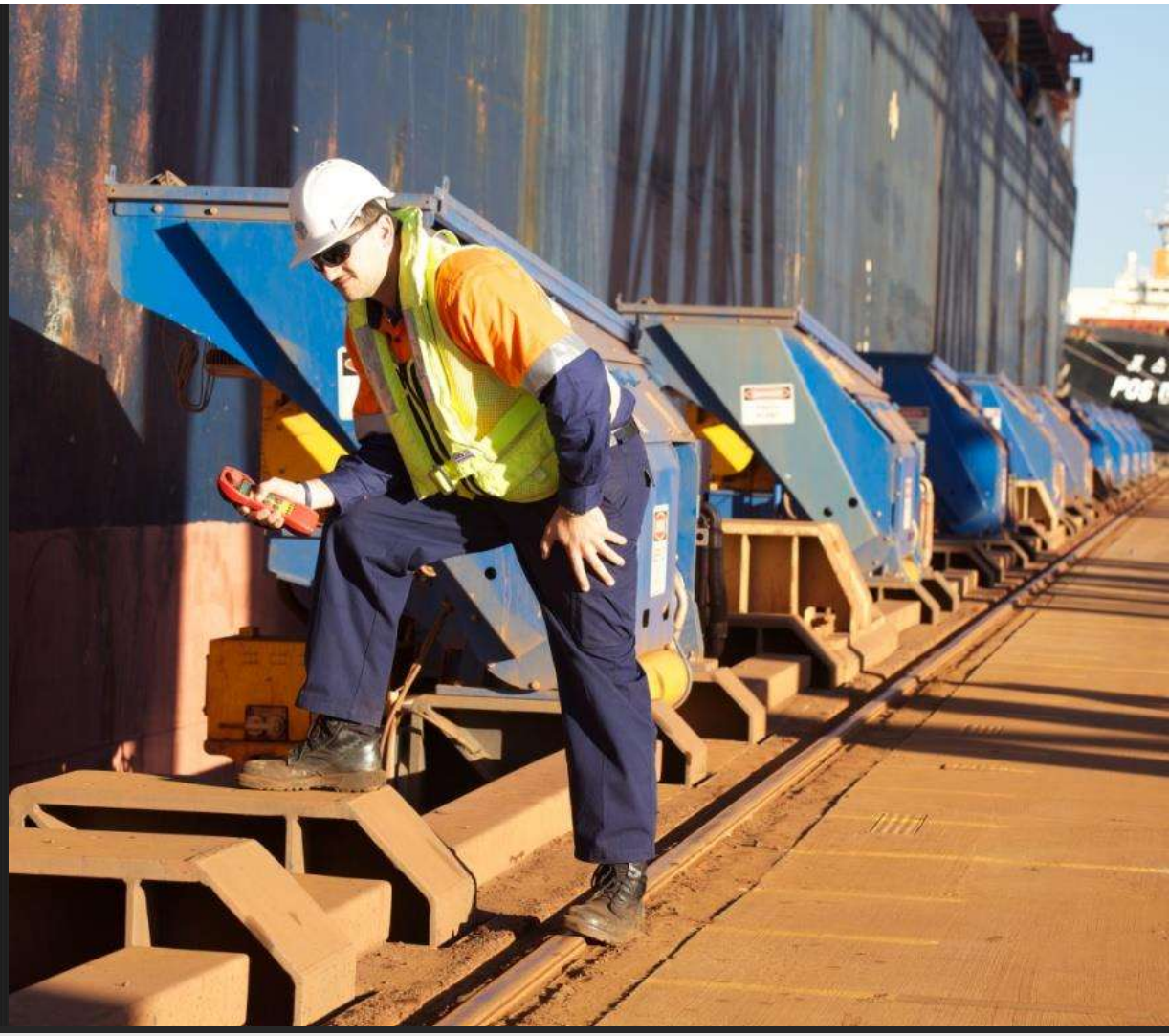
- Remote controlled and/or automated passenger bridges, car ramps, hatches etc.
- Automated check-in/boarding
- Cargo tracking systems

CONTAINER TERMINALS

- Automated Stacking, RMG & STS Cranes
- Automated Guided Vehicles (AGVs)
- Automated Straddle Carriers
- Cargo tracking systems
- Automated terminal operating systems
- Semi-automated or full automated shore power supply systems

MoorMaster™

AUTOMATED MOORING



CHANGING THE WAY YOU MOOR

One man operated Vacuum technology

CAVOTEC
Inspired Engineering

ONE “TRADITION” STILL NEED TO BE IMPROVED

A lot of people with hands on…

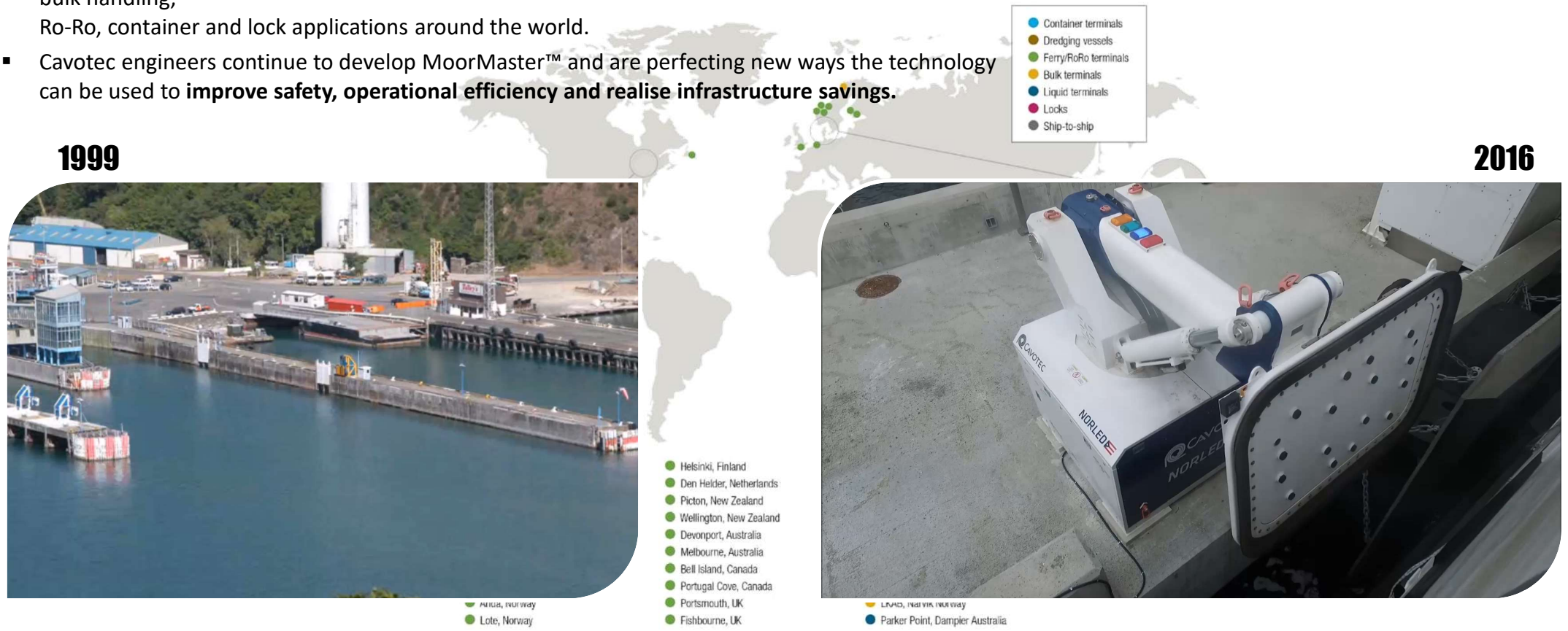
Unpredictable - dangerous

High Load points Labour intensive Limited effectiveness

Manual operation “Old” / Obsolete Time consuming

MoorMaster™ evolution

- MoorMaster™ first **entered into service in 1999** at a ferry application in New Zealand. At this point, MoorMaster™ was a bold challenge to thousands of years of conventional mooring methods
- Today, MoorMaster™ is a widely accepted technology that has performed over **260,000 mooring operations,** with a near to 100% safety record, at ferry, bulk handling,
  Ro-Ro, container and lock applications around the world.
- Cavotec engineers continue to develop MoorMaster™ and are perfecting new ways the technology can be used to **improve safety, operational efficiency and realise infrastructure savings.**



MoorMaster™

VIDEO CLIP

Container terminal

CHANGING THE WAY YOU MOOR

One man operated Vacuum technology

CAVOTEC
Inspired Engineering

MoorMaster™ - a short review

A strong vacuum couple between Ship & Shore

MoorMaster™ - a short review

The vacuum pad

- Steel construction
- Neoprene rubber seal
- Effective sealing area = 2.55m^2
- Suction force = 20 tonnes
- 26mm lip to seal around obstructions
- Tested by DNV

- Surface must be relatively flat
- Seal will adapt to minor obstructions
- Vacuum accumulator
- 10-20 minutes of attachment on poor surface in case of power failure

MoorMaster™ - a short review

Range of Motion & Forces

HOLD

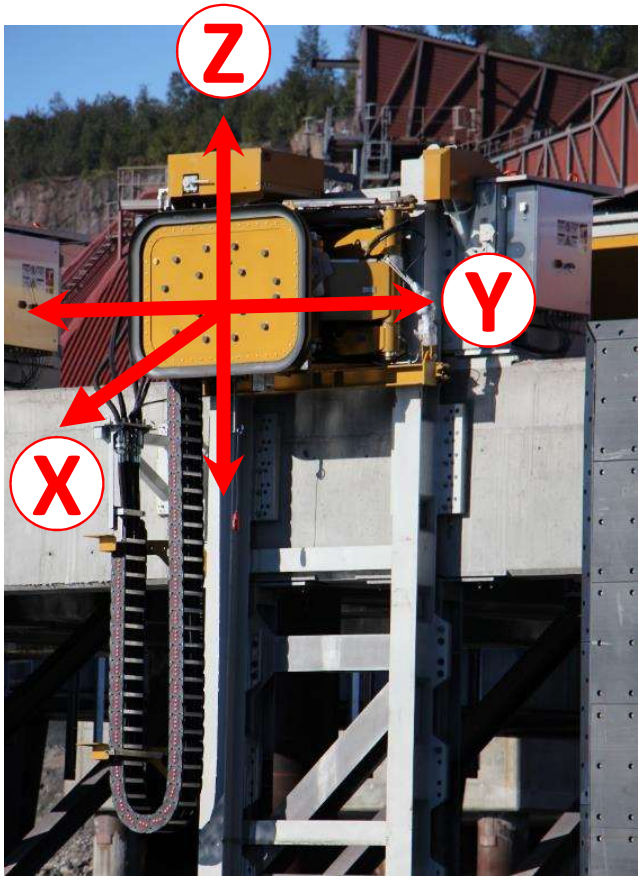
- In-Out motion ("X" axle - perpendicular to berth)
  - *Mechanically limited / range dependent on linkage geometry*
  - *Movement beyond mechanical limit will result in decoupling*
  - *Max strength at 80% vacuum : 20 tons x pad*

DAMPEN
WHARP
REPOSITION

- Left-Right motion ("Y" axle - parallel to berth)
  - *Range dependent on linkage geometry*
  - *Movement beyond mechanical limit will result in decoupling*
  - *Max strength at 80% vacuum : 10 tons x pad*

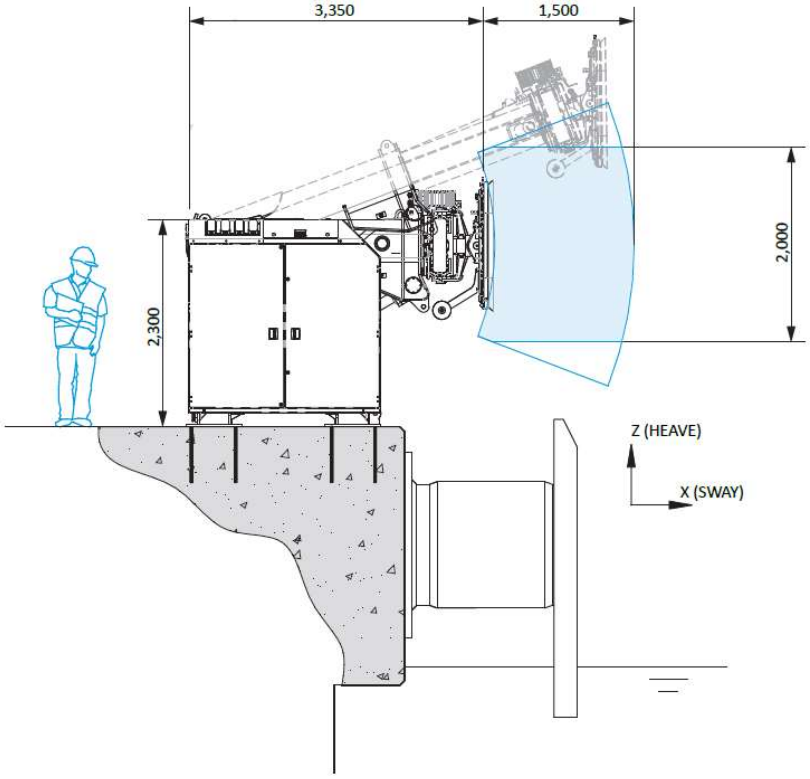
FREE
NEUTRAL

- Up-Down motion ("Z" axle - vertical to berth)
  - *Unlimited with 'stepping'*
  - *Vertical rails length depending on various factors*



MoorMaster™ - a short review

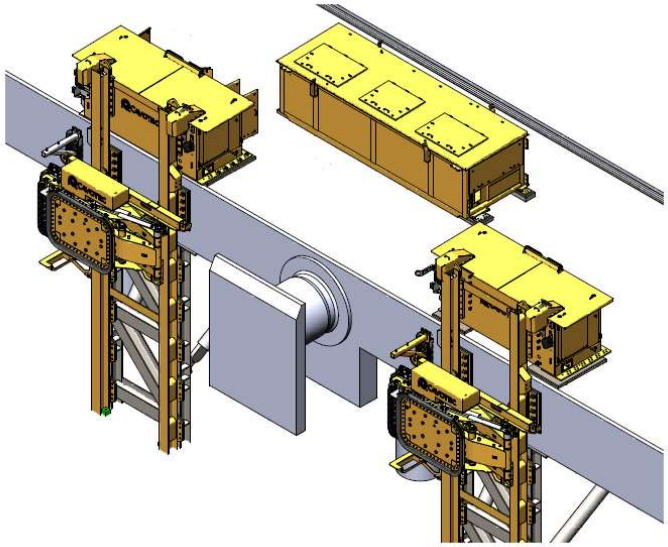
A typical TOP MOUNTED unit



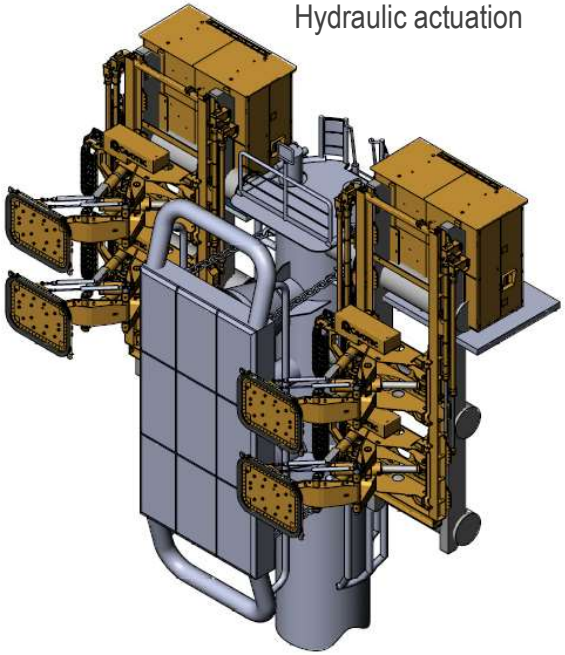
MoorMaster™ - a short review

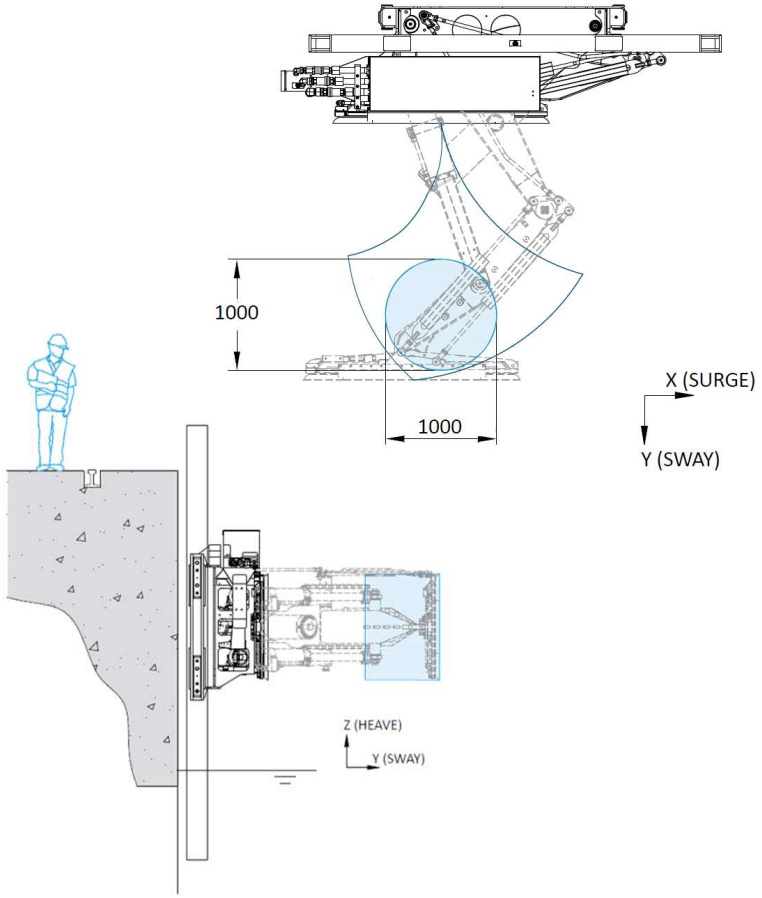
A typical FRONT MOUNTED unit

Winch actuation



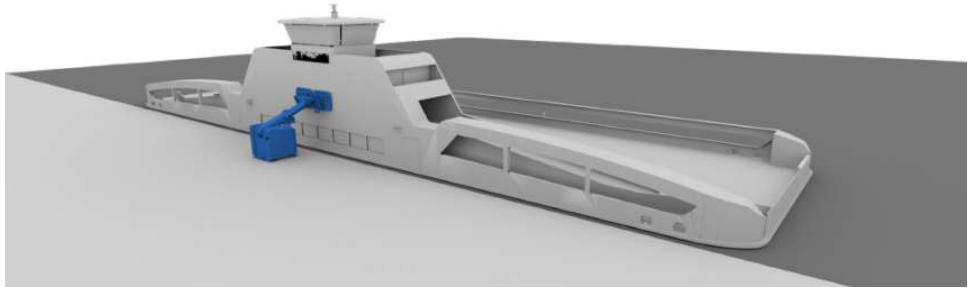
Hydraulic actuation



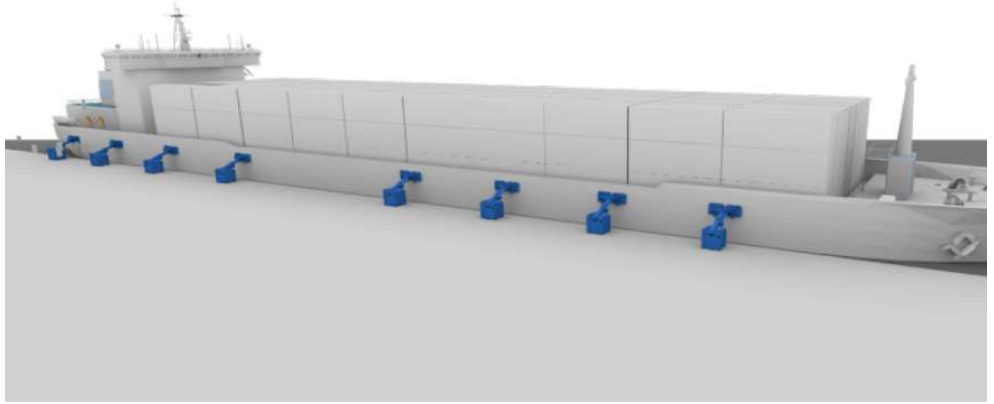


MoorMaster™ - a short review

Systems



- Ferries with 1-6 units (1 or 2 pads per unit) depending on ship size & environmental conditions
- Typically controlled from bridge wing



- Bulk & container terminals with 8-18 units (1 or 2 pads per unit) depending on ship size & environmental conditions
- Typically controlled from shore

SHORE POWER SOLUTIONS

30 years of experience

CAVOTEC
Inspired Engineering

Shore Power Supply with over 30 years experience


Dispensers


Telescopic booms


AMP Mobile

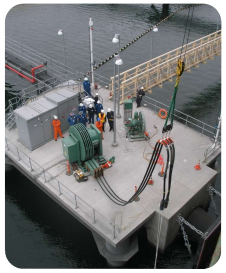

APS tower
LV (1kV) & HV (10kV)
as well DC


Power plugs & sockets


Power Units


AMP Mobile


Loop systems


Barge/Dolphin systems


Pre-fab Pits and strong Access covers


Radio Remote controls

Low & Medium Voltage

More than 600 installations World Wide

Fully automated ?

VIDEO CLIP

Ferry, charging and mooring

CHANGING THE WAY YOU MOOR

One man operated Vacuum technology

CAVOTEC
Inspired Engineering

Summary of Cavotec`s contribution

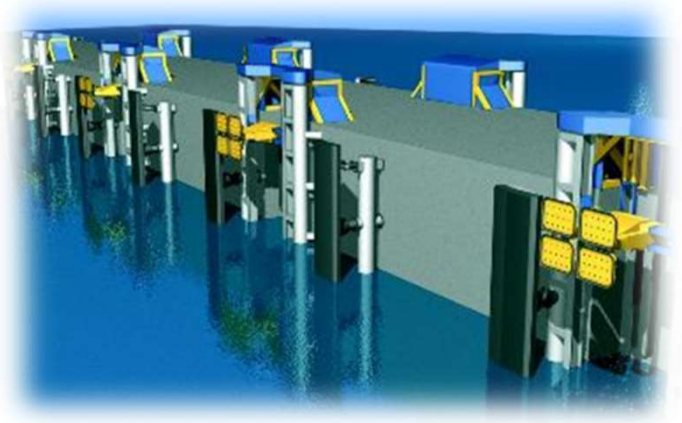
ShorePower

- AIS module/signal to recognize the vessel to correct ShorePower unit based on vessel needs
- Complete automated plugging system or semi-automatic
- Remote real-time monitoring, RTM
- Automated logging of power transfer if needed
- Integration of alarm system with main ship alarm system

Summary of Cavotec`s contribution

MoorMaster™

- AIS modules to recognize vessels and adapt specific MM configurations to the vessel
  - Obstructions on the hull
  - Reduced vacuum for softer grip on light metal hull plating
  - Free vertical movement and automated stepping function allow for automated handling of tidal & draft variation
- Complete automated mooring without human interference possible with a software and hardware update
- Automated repositioning/fine adjustment of position possible with a software and hardware update
- Automated vertical or sideways repositioning to avoid hull obstacles with a software and hardware update
- Remote real-time monitoring, RTM
- Integration of alarm system with main ship alarm system



Thank you for your attention

cavotec.com