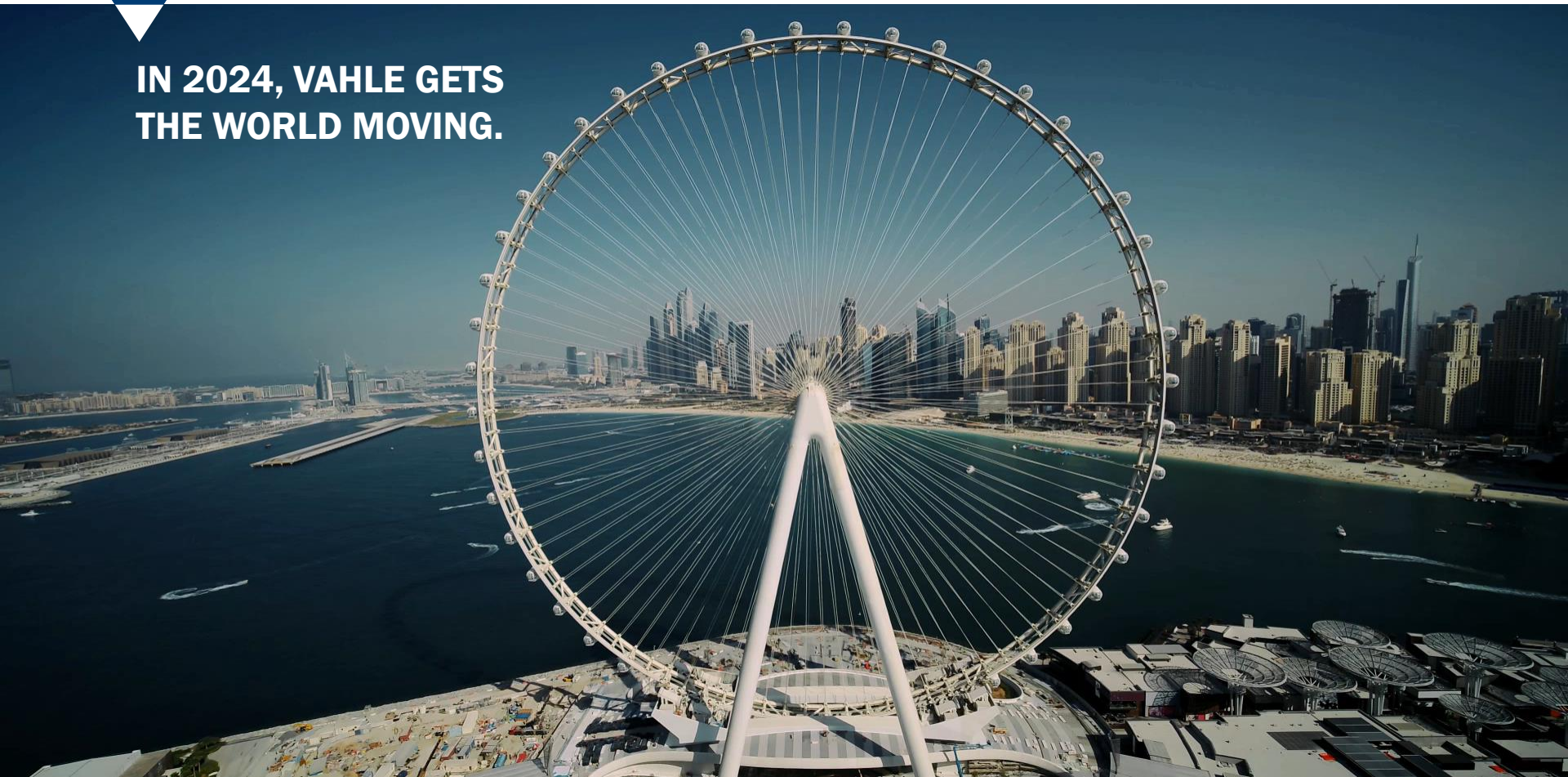
ACHIEVING SUSTAINABLE PORT OPERATIONS: INNOVATIONS AND MILESTONES AT MODERN TERMINALS LTD.


IN 2024, VAHLE GETS
THE WORLD MOVING.

Simplified Container Terminal Overview

Container Terminal Automation

Step by step approach

1.0 ELECTRIFICATION

Insulated conductor rails 1000V, 1000A with aluminium/ stainless steel

2.0 POSITIONING

Precise position feedback with a contactless reading head

3.0 DATA COMMUNICATION

Interference-free and safe data & video

2020 - 300 Mbps

2023 - 600 Mbps

2025 – 1 Gbps

4.0 - AUTOMATION

Combination of electrification, positioning and data communication for remote control

Case study – Hong Kong | P.R. of China– Modern Terminals Ltd.

Innovations and Milestones

2011 – 2013

Brownfield

Electrification of 94 retrofit RTGCs

Electrification of 8 new RTGCs

Container Blocks

66 blocks (14 km busbar installation)

Case study – Hong Kong | P.R. of China– Modern Terminals Ltd.

Innovations and Milestones

CASE STUDY:

RTG Conversion

MTL continuously seeks better ways to enhance its efficiency and reduce its dependency on non-renewable fossil fuels. After converting 44 of its RTGs into Hybrid-RTGs in 2009, the company began to adopt E-RTGs in 2011 in order to reduce fuel consumption and emissions. It had replaced 81 of its fleet of 101 RTGs with E-RTGs by the end of 2012. Eventually, 94, or more than 90% of all its RTGs, will be E-RTGs, making it the largest E-RTG fleet in Hong Kong. There is zero direct CO_2 emission by E-RTGs during their operations in the terminals. When compared to a traditional diesel-powered RTG, an E-RTG's CO_2 emission(Footnote 2) is reduced by about 60%.

CO_2 Emission per TEU (Hong Kong Business Unit Only)

Goal:
To reduce CO_2 emissions by 30% between 2006 and 2015

Case study – Hong Kong | P.R. of China– Modern Terminals Ltd.

Innovations and Milestones

Green Terminal Model

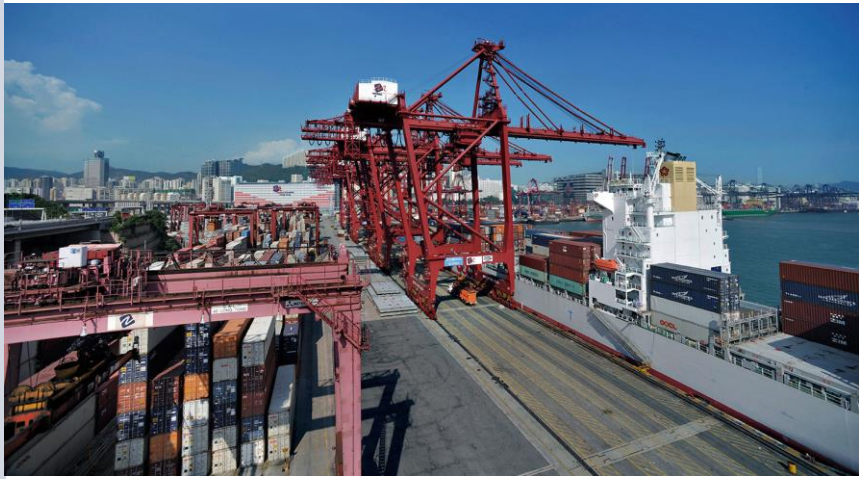
STRATEGIC REVIEW
To identify key environmental considerations in the region before planning and construction of terminals

BUSINESS DEVELOPMENT
To identify key environmental requirements of the government, local community as well as business partners, and to assess and prioritize risks associated with port construction and operation

BUILDING THE INFRASTUCTURE
To integrate environmental design solutions into port infrastructure and facilities to address identified environmental risks and challenges

BUILDING THE BUSINESS
To set up a system to monitor and review terminals' performance, and to implement environmental value proposition during our business building phase

OPERATING THE BUSINESS
To implement ongoing monitoring and reviewing of management systems for continual improvement



Electricity-powered Rubber-tyred Gantry Cranes (E-RTGs) Conversion

By the end of June 2015, there were some 200 Rubber-tyred Gantry Cranes (RTGs) across our business units in Hong Kong and mainland China. To reduce associated emissions, the Group has been progressively replacing traditional diesel-fuel powered RTGs with hybrid RTGs and E-RTGs. All of our 94 RTGs in HKBU were converted to E-RTGs with engines compliant with EU Stage IIIA emission standards by the end of 2014; DCB has already been using a full fleet of E-RTGs since it commenced operations in 2007; in TIG P2, E-RTG conversion has taken place in 2008, covering 95% of all RTGs. In 2014, the replacement of eight E-RTGs in HKBU contributed to the reduction of over 850 tonnes of CO_2e emission.

STEPPING UP ENERGY SAVING AND EMISSION REDUCTION EFFORTS

We always strive to reduce our energy consumption and emissions by deploying equipment with the latest technology or powered by green energy. With the completion of conversion of all our diesel-powered Rubber-tyred Gantry Cranes (RTGs) to Electricity-powered RTGs (E-RTGs) in 2014 in Hong Kong, we have made significant achievements to reduce emissions. In the last ten years, we have reduced our carbon emissions per twenty-foot equivalent unit (TEU) from 14.39 kg to 10.12 kg, translating into a reduction of 27,500 metric tonnes in 2017 comparing with 2008 emission performance. Our efforts to reduce energy consumption and carbon emissions continue.

Case study – Hong Kong | P.R. of China– Modern Terminals Ltd.

Innovations and Milestones

2023/2024

Brownfield

Electrification of 14 new ZPMC RTGCs

In 2 batches

In addition, we have procured 14 Eco-RTGs for our operations in Hong Kong which will be delivered in 2024. The new Eco-RTGs, supported by newer technology, will be replacing 18 existing Electricity-powered RTGs (E-RTGs) to further reduce direct emissions as they will operate purely on electricity.

Automation of Port Equipment

Upgrade any Yard Crane | Increase the flexibilty

AVAHLE

Festoonless STS

Technical benefits

- ✓ Minimize weight movement
- ✓ High trolley speed, up to 600 m/min
- ✓ No influences by wind / heavy rain / ice
- ✓ No cable loops and no storage area
- ✓ Extremely low maintenance

Operator´s benefits

- ✓ Faster container handling through speed increase of the main hoist (trolley & lift)
- ✓ Higher container stacking level
- ✓ High availability and absolute reliable
- ✓ Optimized Total Cost of Ownership

RMG/ASC with busbars

Technical benefits

- ✓ Reduce weight on board of the ASC and cost of the ASC
- ✓ Reduce cost of control system
- ✓ Increase speed & performance
- ✓ Extremely low maintenance

Operator´s benefits

- ✓ Faster container handling through increased travel speed
- ✓ High availability and absolute reliable Data Communication & Positioning system
- ✓ Optimized Total Cost of Ownership

AeRTGCs

Technical benefits

- ✓ Flexible yard operation
- ✓ Automatic connection system
- ✓ Autosteering
- ✓ Seamless synchronisation
- ✓ Reduced GenSet maintenance cost (if any)

Operator´s benefits

- ✓ Flexible yard operation
- ✓ Optimized OPEX by reduced fuel & idle time
- ✓ Reduction of CO^2 and Noise pollution
- ✓ Smart / Predictive Maintenance
- ✓ Optimized Total Cost of Ownership

YOUR VISION COUNTS:
WE ARE READY

MEET US AT:
BOOTH B16