

# 10th Philippine Ports and Shipping 2019

## Manila



PETER THOMAS



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# The Challenges!



Faster Turn Around / Automation



Lower Operating Costs



Highest Equipment Availability / Utilization



Higher Capacity



Reduced Emissions



# Some topics to help the future!

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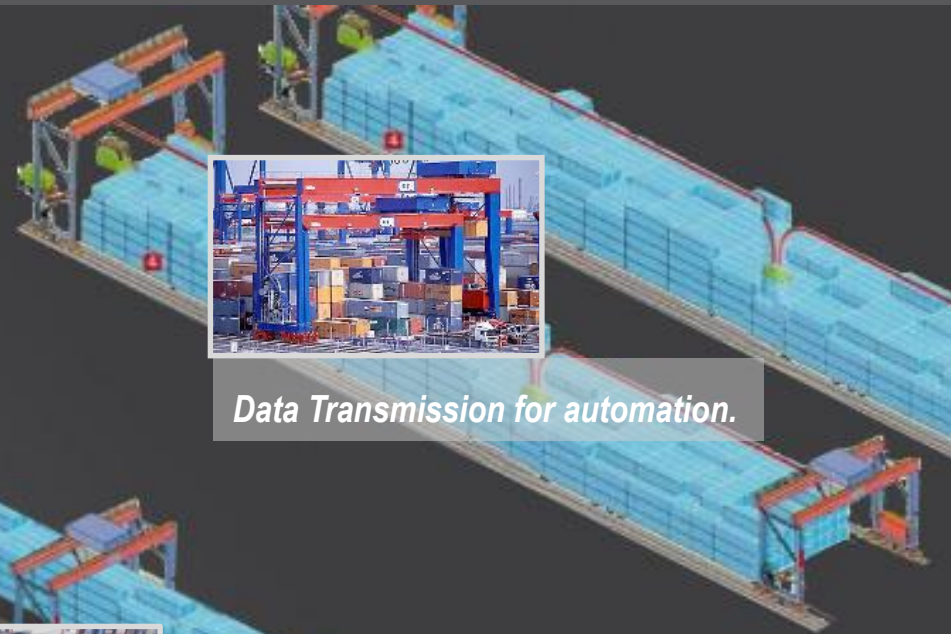
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Energy & Data Transmission Systems



*Smart products for reliability.*



*Data Transmission for automation.*



*Battery Technologies for efficiency.*



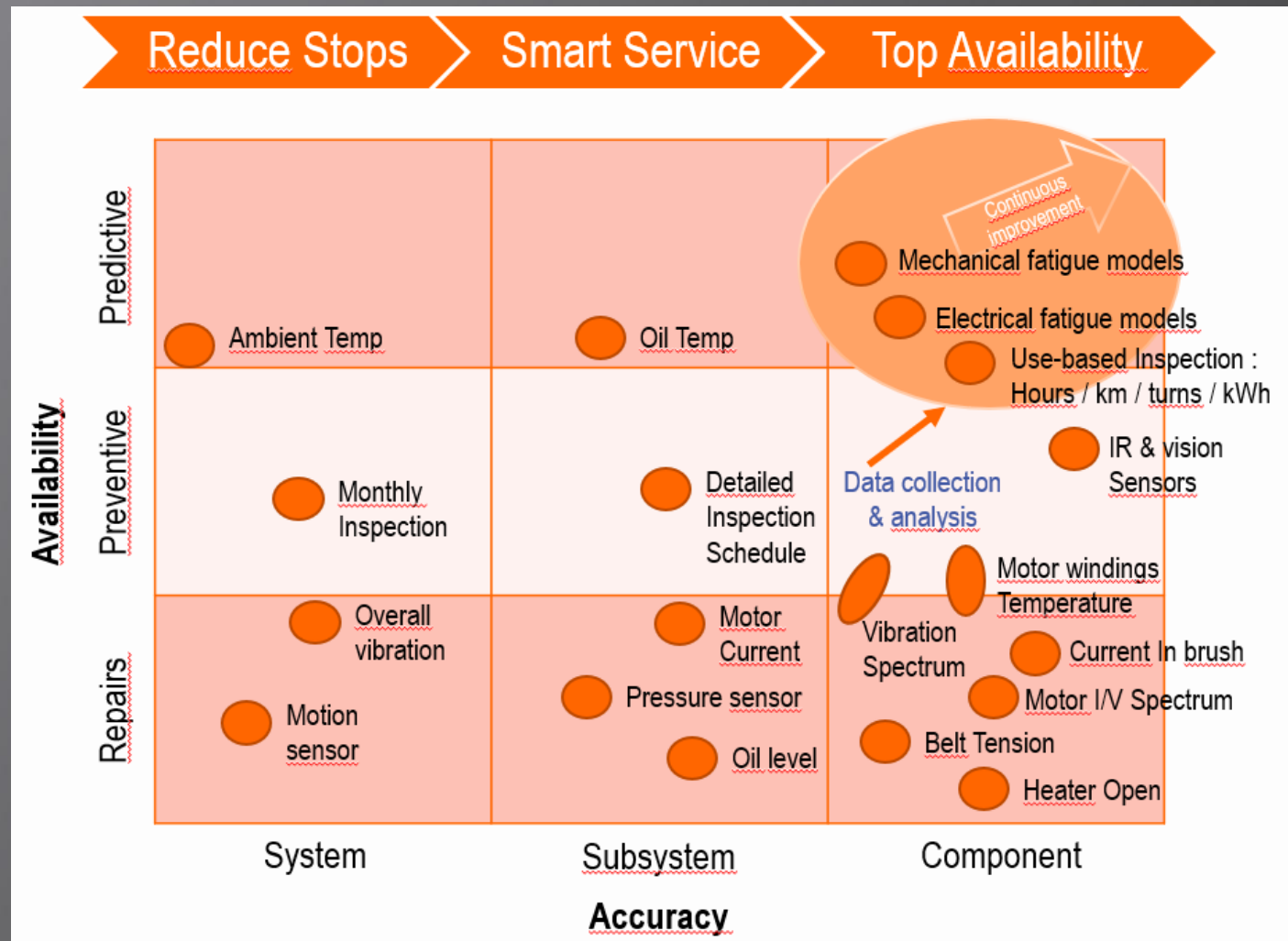
*Electrification Of Yard Equipment.*



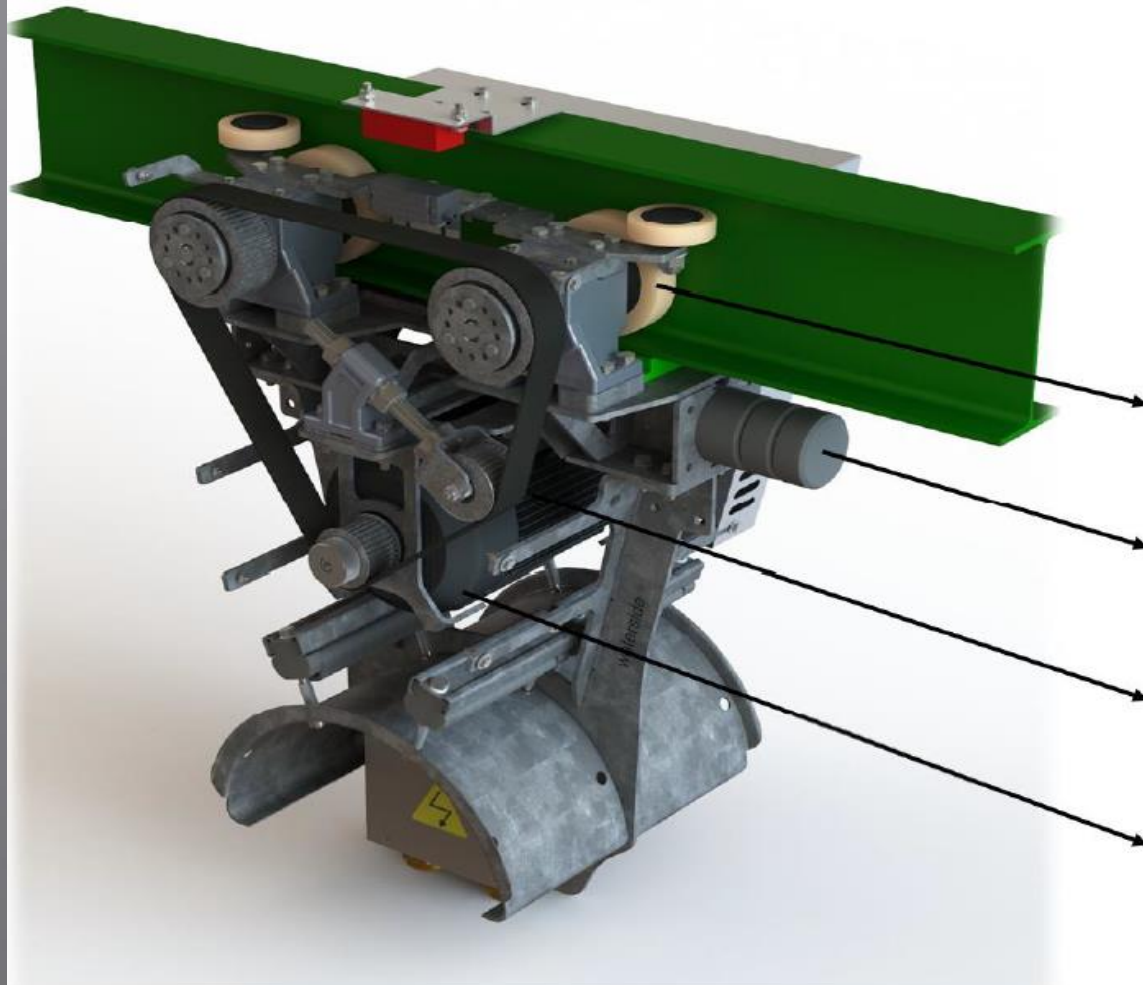
## What it is?

- Upgrading of existing, or new equipment which has sensors, functions and AI support to enable higher reliability, efficiency and lower operating costs.

# Example of smart product functionality



# smart products for Quay Crane Festoon



Accelerometer



Gyroscope



Magnetometer



Humidity sensor



Pressure sensor



Temperature sensor



Acoustic sensor



Digital light sensor

Relevant Parts	Parameter for Predictive Maintenance - Calculation	Sensor for Failure Detecting
Roller	Travel distance / Working hour / Humidity / Temperature	Accelerometer Gyroscope Acoustic Sensor
Buffer	Acceleration / Working hour / Humidity / Temperature	Accelerometer Gyroscope Acoustic Sensor
Belt	Acceleration / Working hour / Humidity / Temperature	Accelerometer Gyroscope Acoustic Sensor
Motor	Travel distance / Working hour / Humidity / Temperature	Accelerometer Gyroscope Acoustic Sensor

# Electrification of yard equipment

## What it is?



- Upgrade of RTG from Diesel Genset to reduce emissions, operating costs and downtime with :

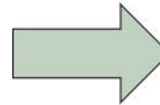
### Motorized Cable Reel Solutions

- ✓ Manual or automatic cable connection to grid power



### Conductor Rail Solutions

- ✓ Manual or automatic connection to grid power



### Hybrid Solution

- ✓ Hybrid with a big battery pack and a small onboard genset



### Zero Emission Solutions

- ✓ Full E-RTG
- ✓ Battery E-RTG
- ✓ Fuel Cell Battery E-RTG



New possibilities with  
**Battery** solutions

# Electrification of yard equipment

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# Electrification of yard equipment



## HYBRID BENEFITS

- Battery pack supports more than 30 container moves without recharging
- Regenerative energy during container lowering is fully utilized to charge the battery
- Up to 60% fuel saving compared with conventional genset
- Less Refueling operations
- Reduce maintenance cost
- Reduce considerably the environmental impact (CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, particules + noise)
- RTG maintains full operational flexibility (e.g. block changes), no changes in operation
- Independent from power grid
- No yard infrastructure is necessary

# Electrification of yard equipment



## HYBRID



Battery housing mounted under sill beam

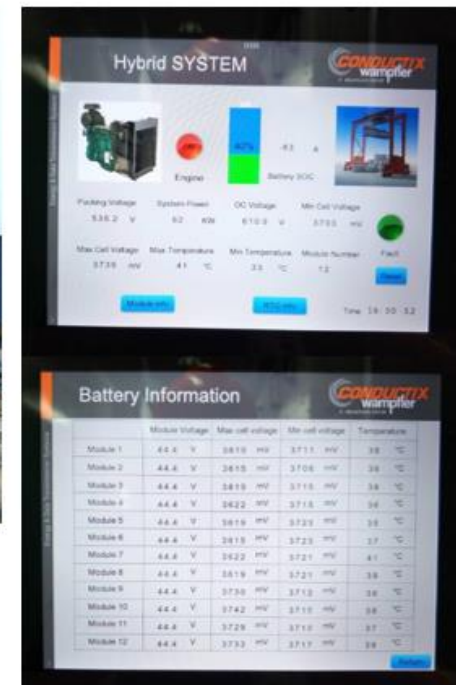


Battery modules inside the housing



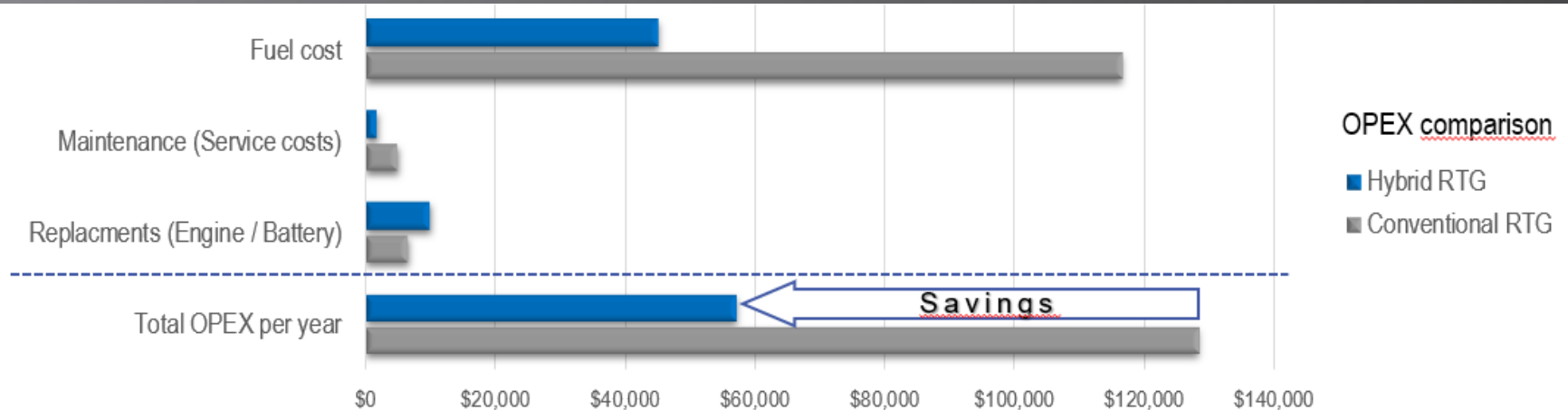
Small diesel genset mounted under sill beam

- Equipped with a big battery pack powering **all** movements
- Small size genset to charge the battery when needed (e.g. 100kW)
- Hybrid power pack connected to the DC/DC bus



HMI Touch Panel

# Electrification of yard equipment



	Sample case	Conventional RTG	Hybrid RTG	Savings
		18l/h	7l/h	
<b>Fuel saving per year</b>	10 moves/h, 18 h/day, 300 days/year, 1.03 USD/l	100,116 USD/year	38,934 USD/year	<b>61,182 USD/year</b>
<b>Maintenance service per year</b>	100 USD/h	50h/year -> 5,000 USD/year	20h/year -> 2,000 USD/year	<b>3,000 USD/year</b>
<b>Replacements (Engine / Battery)</b>	15 years operation yearly average	6,670 USD/year	10,000 USD/year	<b>-3,330 USD/year</b>
<b>Yearly saving per RTG</b>				<b>60,852 USD/year</b>

Thank you and come see us at Booth 52



Focus Markets – Container Handling