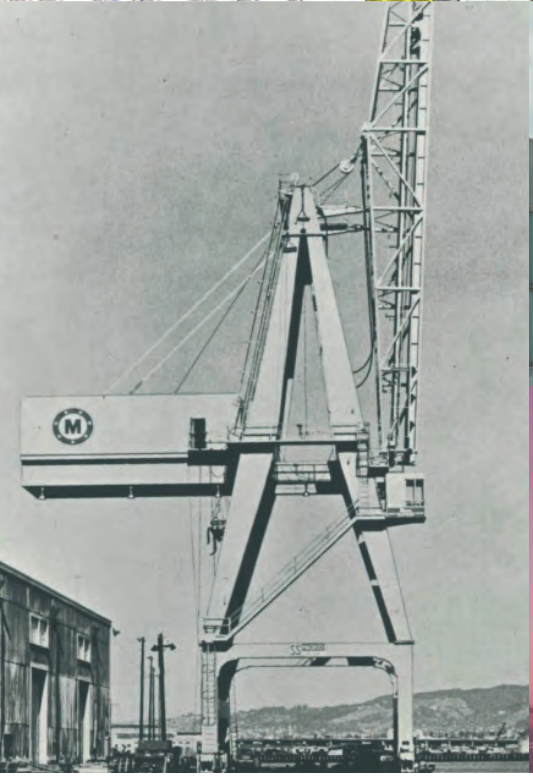
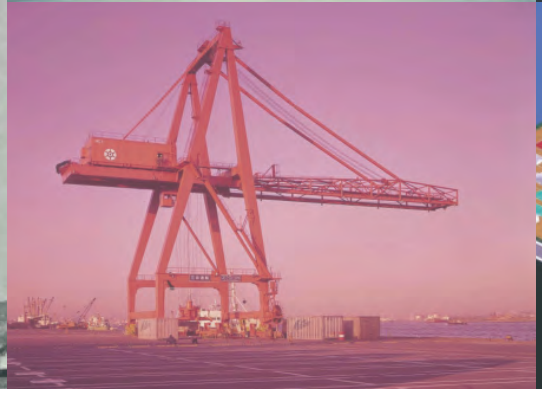
MITSUI

LOGISTICS SYSTEMS



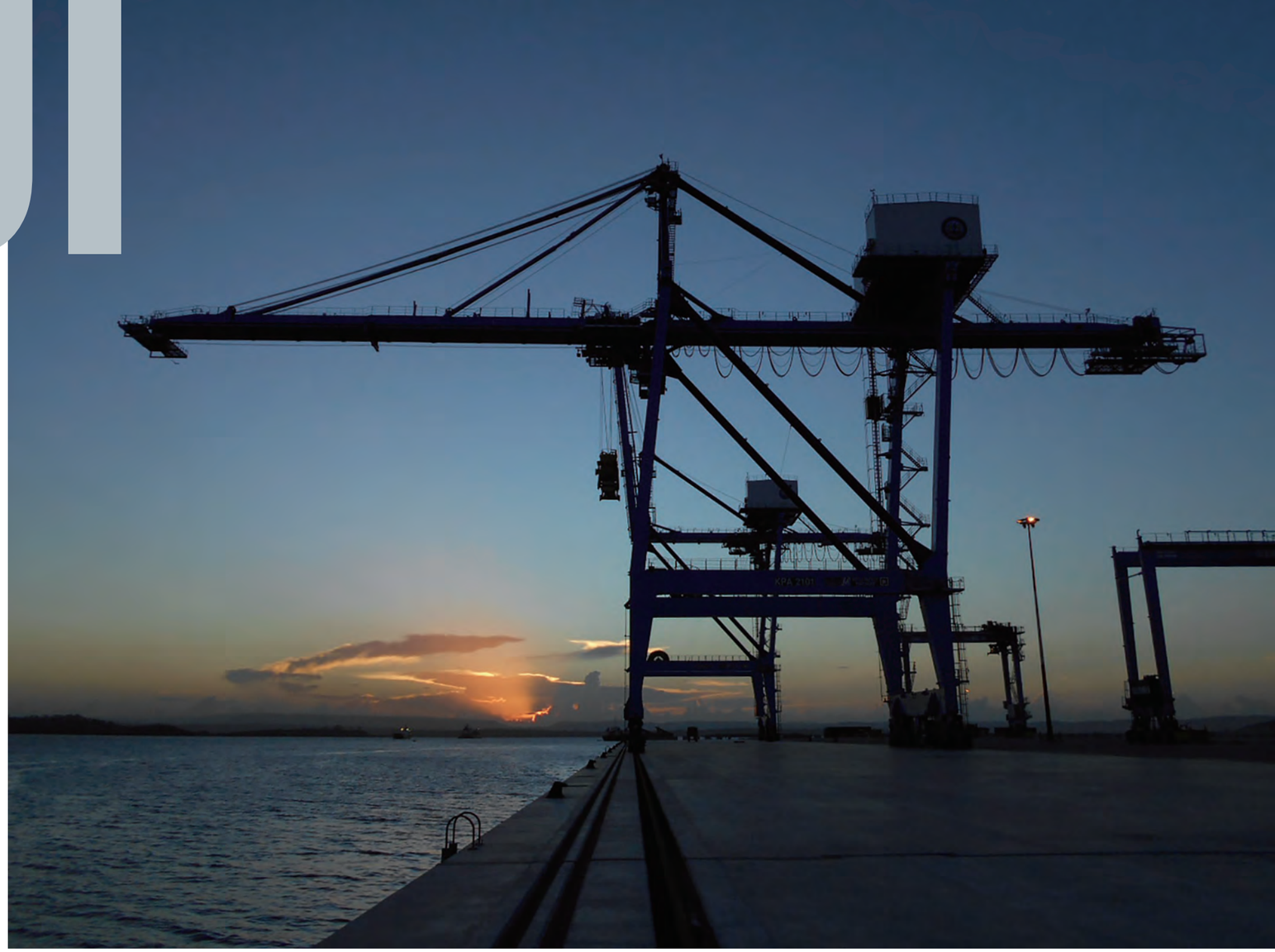


MITSUI E&S

MITSUI

Established and Reliable Technology Supporting the Global Logistics.

Since the 1930s, MITSUI E&S Co., Ltd. has started to manufacture cranes.
(formerly Mitsui Engineering & Shipbuilding Co., Ltd. and Mitsui E&S Machinery Co., Ltd.)
Then, we fully entered into the container crane business in the 1960s.
We have delivered more than 2,000 units of container cranes to the ports throughout the world to support the fast-changing global logistics since the delivery of our first container crane in Japan to Kobe port in 1967.
We manufacture and deliver not only crane hardware such as container cranes and industrial cranes, but also software including the container terminal management system.
Our wide range of products contributes to the various aspects of our customer's efficient operation.



MITSUI E&S
MITSUI E&S Co., Ltd.

Contents

LOGISTICS SYSTEMS

History of MITSUI-PACECO® Cranes

since 1961

MITSUI-PACECO® cranes have been developed day by day in the long history with various types of cranes utilizing the shipbuilding technologies.

1961 Technical License Agreement with PACECO® Inc.

1967 Delivery of First Portainer®

1968 Delivery of First Transtainer®

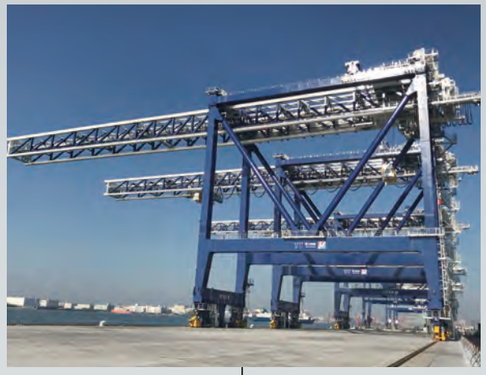
1994 Demonstrative Experiments of Automated Container Terminal (AGV, Remote Controlled Transtainer®, and Portainer®)

2001 Delivery of First Portainer® with Earthquake Seismic Isolation Device

2003 Commencement of Manufacturing at Oita Factory (Transferred from Tamano Factory in Okayama)

2014 Delivery of 300th Portainer®

2017 Delivery of Portainer® with Shuttle Boom



2023 and more Delivery of First NZE (Near Zero Emission) Transtainer®

Tokyo | Japan

Rated Load	61.0t	Hoist Speed	90/180m/min
Outreach	58.0m	Trolley Speed	240m/min
Lifting Height	48.6m	Gantry Speed	45m/min
Span	30.5m	Spreader	Twin-20ft Lift
Feature	Articulated Boom		

Kobe | Japan

Rated Load	65t	Hoist Speed	90/180m/min
Outreach	63.1m	Trolley Speed	240m/min
Lifting Height	44m	Gantry Speed	60m/min
Span	30.5m	Spreader	Twin-20ft Lift
Feature	Earthquake Seismic Isolation Device		

Klang | Malaysia

Rated Load	65.0t	Hoist Speed	90/180m/min
Outreach	67.0m	Trolley Speed	240m/min
Lifting Height	52.0m	Gantry Speed	46m/min
Span	30.48m	Spreader	Twin-20ft Lift

Hawaii | United States

Rated Load	65.0t	Hoist Speed	90/180m/min
Outreach	44.2m	Trolley Speed	245m/min
Lifting Height	36.6m	Gantry Speed	48m/min
Span	30.48m	Spreader	Single Lift

Yatsushiro | Japan

Rated Load	30.5t	Hoist Speed	60/150m/min
Outreach	36.5m	Trolley Speed	180m/min
Lifting Height	32.5m	Gantry Speed	45m/min
Span	16m	Spreader	Single Lift
Feature	Earthquake Seismic Isolation Device		

Tokyo | Japan

Rated Load	65.0t	Hoist Speed	90/180m/min
Outreach	63.0m	Trolley Speed	240m/min
Lifting Height	40.0m	Gantry Speed	45m/min
Span	43.5m	Spreader	Twin-20ft Lift
Feature	Earthquake Seismic Isolation Device / Shuttle Boom		

Gebze | Turkey

Rated Load	61.0t	Hoist Speed	80/180m/min
Outreach	63.5m	Trolley Speed	240m/min
Lifting Height	43.5m	Gantry Speed	45m/min
Span	30.0m	Spreader	Twin-20ft Lift
Feature	Hatch Cover Stand		

Tanjung Priok | Indonesia

Rated Load	65.0t	Hoist Speed	90/180m/min
Outreach	65.0m	Trolley Speed	240m/min
Lifting Height	46.0m	Gantry Speed	45m/min
Span	30.48m	Spreader	Twin-20ft Lift

Portainer®

MITSUI LOGISTICS SYSTEMS

Portainer®

Feature 01 Large Scale Container Crane and Highly Efficient Cargo Handling

The global market demands larger size of Portainer® (Ship-to-Shore) cranes and highly efficient container handlings as container vessels become larger.
The largest Portainer® which we have ever manufactured has 70m outreach, 53m lifting height, and in-house manufactured twin-20ft lift spreader.

>> **Point 01** Adaptation of Large Container Vessel

>> **Point 02** In-house Manufactured Twin-20ft Lift Spreader

Point 01

Point 02

Feature 02 Mono Box Boom Structure

Adapting the mono box boom structure achieves lighter weight yet higher rigidity.
It also makes the wind receiving area smaller which enables the wheel load lighter.
The structure provides a wider walkway, compared with the twin box structure.

Feature 03 Self Propelled Trolley

Adapting the self-propelled trolley system reduces the maintenance works with fewer traverse ropes and enhances responsiveness of the operation.

Feature 04 Traveling Unit Drive

Applying the traveling unit drive with a motor and a reducer all-in-one, without open gears, improves the efficiency of maintenance works.

Feature 05 Centralization of Devices on Girder Platform

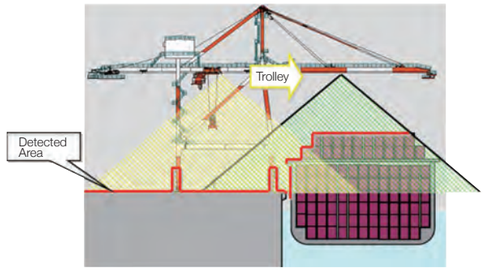
The devices are centralized on the end of girder so that our Portainer® facilitates an easy access and enhances the maintenance efficiency.

Feature 06 Walk-in Type Control Panel

The walk-in type control panel facilitates an access and increases the air-conditioning efficiency through its minimized volume.

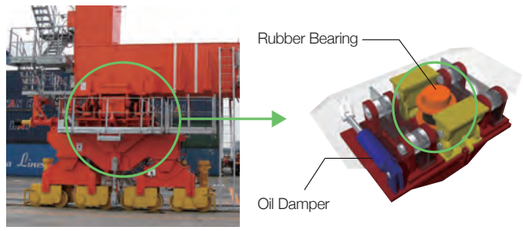
Option 01 Operation Assist System (Ship Profiling System)

Detecting the position of obstacles by 2D laser sensors reduces the failures and improves the efficiency of cargo handling.



Option 02 Earthquake Seismic Isolation Device

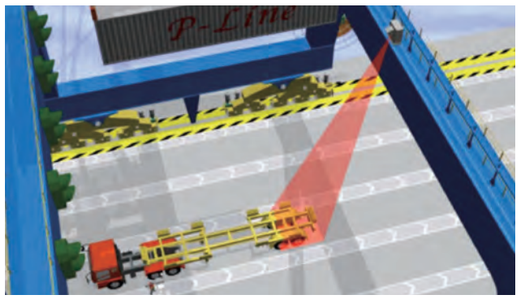
The earthquake seismic isolation device (rubber bearing type) minimizes the damage from an earthquake.



Earthquake Seismic Isolation Device (Rubber Bearing Type)

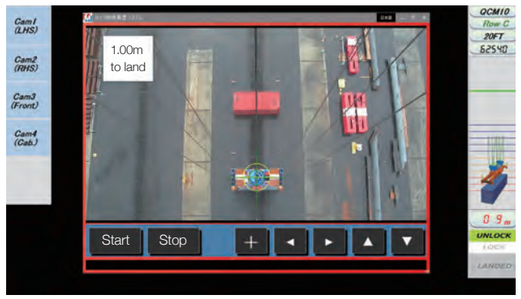
Option 03 Chassis Position Detection System

Detecting the position of chassis supports to stop at the proper location.



Option 04 Operating Assist Monitor

Detecting the center position of the container and the spreader to assist the alignment at container handlings.



Yokohama | Japan

Rated Load	50.8t	Hoist Speed	23/52m/min
Span	23.47m	Gantry Speed	90/135m/min
Lifting Height	18m	Eco Feature	Hybrid
Stacks	1 over 5	Anti-Sway	Torque Motored

Tokyo | Japan

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	23.47m	Gantry Speed	90m/min
Lifting Height	18m	Eco Feature	Near Zero Emission
Stacks	1 over 5	Anti-Sway	Torque Motored

Klang | Malaysia

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	23.47m	Gantry Speed	90/135m/min
Lifting Height	21m	Eco Feature	EVSC*
Stacks	1 over 6	Anti-Sway	Torque Motored

*Engine Variable Speed Control

Long Beach | United States

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	22.56m	Gantry Speed	90/135m/min
Lifting Height	21m	Eco Feature	Near Zero Emission
Stacks	1 over 6	Anti-Sway	Torque Motored

Shimizu | Japan

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	23.47m	Gantry Speed	90/135m/min
Lifting Height	15.24m	Eco Feature	Electrified (Cable Reel)
Stacks	1 over 4	Anti-Sway	Torque Motored

Hakata | Japan

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	29.45m	Gantry Speed	90/135m/min
Lifting Height	15.24m	Eco Feature	Electrified (Bus-bar)
Stacks	1 over 4	Anti-Sway	Torque Motored

Ho Chi Minh City | Vietnam

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	23.65m	Gantry Speed	90/135m/min
Lifting Height	18m	Eco Feature	Electrified (Cable Reel)
Stacks	1 over 5	Anti-Sway	Torque Motored

Los Angeles | United States

Rated Load	40.6t	Hoist Speed	23/52m/min
Span	23.47m	Gantry Speed	90/135m/min
Lifting Height	21m	Eco Feature	Hydrogen Driven
Stacks	1 over 6	Anti-Sway	Torque Motored

Transtainer®

MITSUI LOGISTICS SYSTEMS

Transtainer®

We offer a wide variety of container cranes such as electrified Transtainer® and hybrid Transtainer®, so that we can provide customers with the suitable system depending on their container terminal layout and operation.

01 Electrified (E-RTG)

MESecoTT

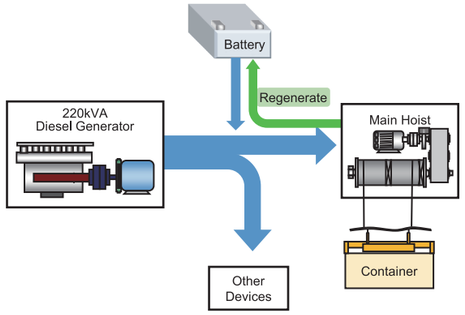
01 On-Board Cable Reel

02 Bus-bar

03 Cable Reel Carrier

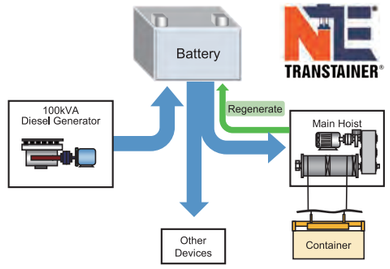
02 Lithium Ion Hybrid

System



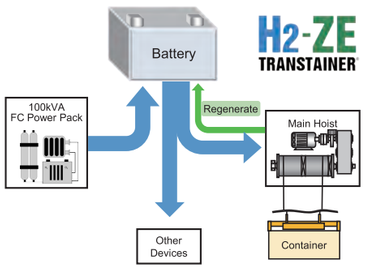
03 Near Zero Emission

System



04 H2 Zero Emission

System

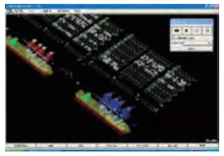


05 Remote / Automation

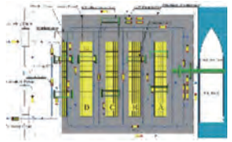
MES SmartTT

Transtainer® for Developing Automated Features

Remote Control Console



Computer Simulation



Terminal Layout Plan

Rail Mounted Gantry Crane for Slab Handling

Industrial Crane for Steel Product Shipping

1500T/H Unloader

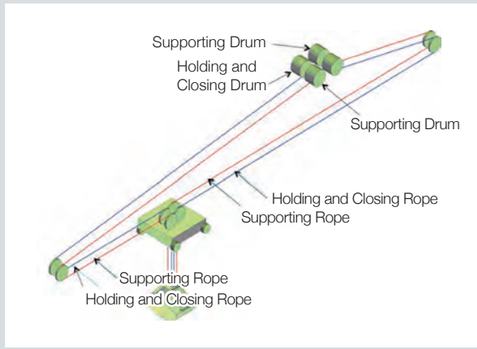
Industrial Crane

Features of Industrial Crane

Feature 01 4-Drum Type Rope-Towed Trolley System

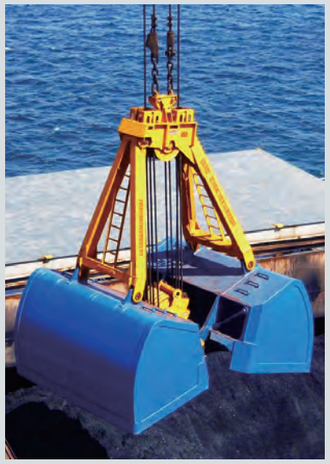
The complex structure of the traverse rope for the conventional rope towed trolley typed unloader is changed to a simple design for achieving easier rope maintenance.

- ›› **Point 01** Saving the maintenance cost by reduced quantities of the wire rope
- ›› **Point 02** Reducing downtime of Unloader through the shortened time for rope replacement
- ›› **Point 03** Realizing lightweight and less maintenance works through the simple structure

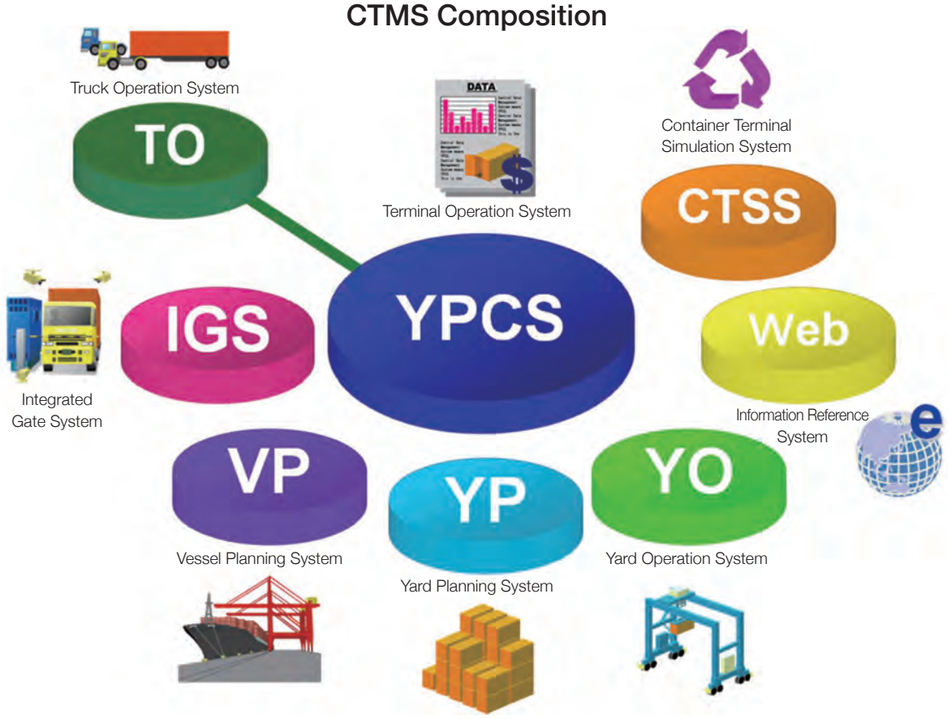


Feature 02 Lightweight yet Durable Grab Bucket

It seemed necessary for the conventional grab bucket to be heavyweight to grab a bulk cargo.
However, we form a partnership with a world-class bucket manufacturer who has an extensive experience in supplying lightweight yet durable buckets.
By adopting it to the 4-drum typed unloader, a significant weight reduction and an energy saving are realized.



CTMS Composition



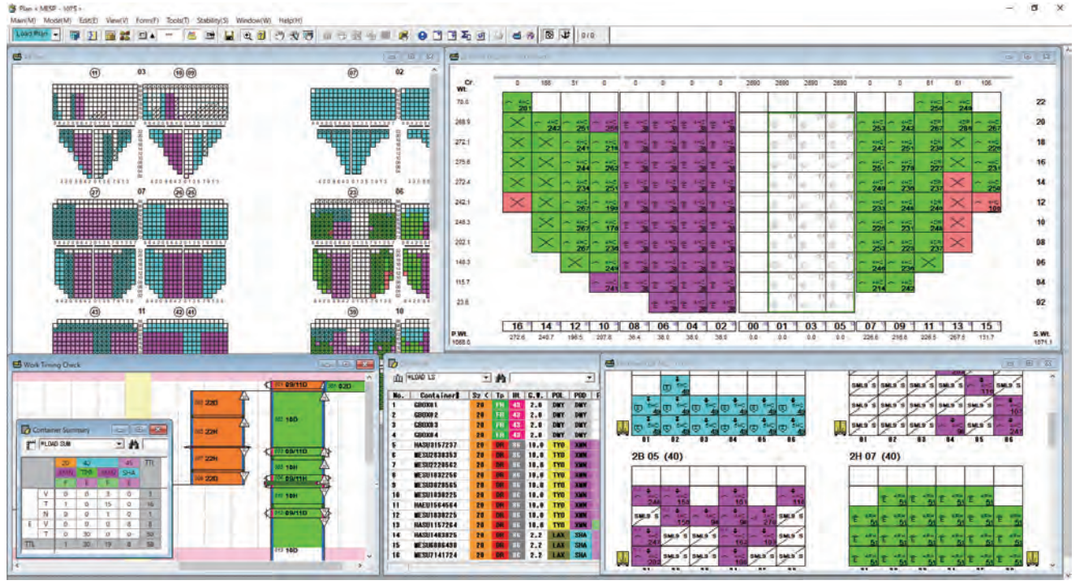
Our total solution from software to hardware accomplishes the optimization of the container terminal operation and the related business.

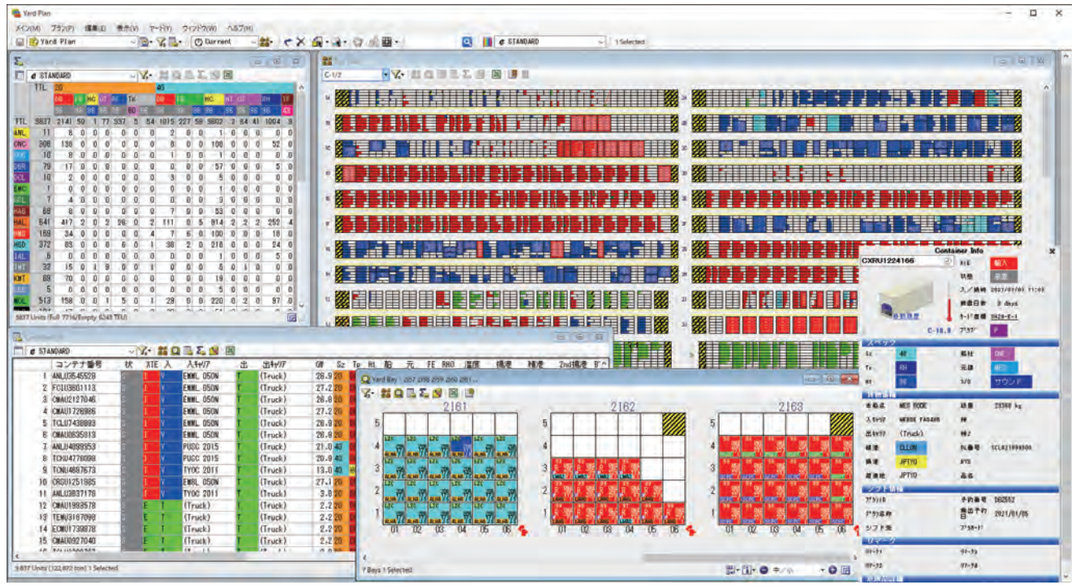
›› **Point 01** We provide you with the suitable system through the combination of the software package based on our extensive experience and the state-of-the-art hardware.

›› **Point 02** The drastic cost reduction in terminal operation can be achieved by the advanced function and the user-friendly system operation for the operational efficiency.

›› **Point 03** The proven and reliable CTMS functions such as the information disclosure system on the internet greatly improve your customer service.

›› **Point 04** Our detailed maintenance support enables the reliable and secure system operation.





CTMS

CARMS
Crane Advanced Remote Monitoring System

Next-Generation Container Crane Remote Monitoring System

Key Point

- ✓ Data accumulation in the MES cloud
- ✓ AI and machine learning for detecting signs of breakdown
- ✓ Centralized management of multiple cranes incl. competitor's crane

Simultaneous Browsing

- Crane Owner
- Crane User
- Maintenance Worker
- MITSUI E&S

Conventional Maintenance

- ✓ Maintenance worker can figure out where the failure is, only on-site.
- ✓ Part replacement can be done after a failure arises.

Result

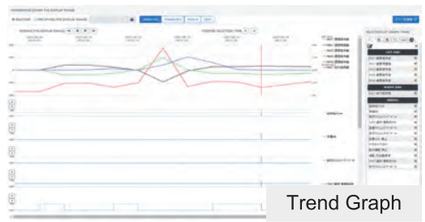
- Recovery from a failure takes much time.
- Downtime of a crane is prolonged.

Feature

i. Real-time monitoring of crane status through the web browser
ii. Alert notification for failures
iii. Result confirmation of preventive maintenance such as anomaly diagnosis
iv. Troubleshooting from remote locations

Screen Image

System Screen



Trend Graph

General Feature

- ✓ Power Consumption
- ✓ Failure History
- ✓ Wind Data
- ✓ Driving Status
- ✓ Equipment Status
- ✓ Power Circuit Diagram
- ✓ Maintenance Information
- ✓ Cargo Handling Report
- ✓ Overall Port Information
- ✓ Cargo Handling Information

Add-Ons Feature

- ✓ Inverter
- ✓ Reducer
- ✓ Wire Rope*
- ✓ Traverse Rail*

(*under development)

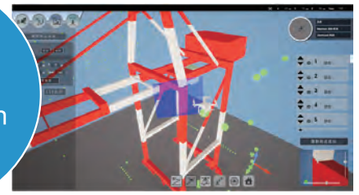
- ✓ Motor
- ✓ Structure:
  - Remaining Life
  - Dron Inspection

DRONE SNAP

The application creates the flight route file which is used for automated drone flight and shooting.

Automated operation from flying to shooting

Picture Shooting
Approx 30 min
Picture: 262 shots



Flight route creating with 3D model

Prior confirmation of shooting image

- Drone flight and shooting are completely automated to achieve an efficient and safe inspection.
- The automated flight route is easily created by using the 3D model.
- The highly accurate picture taking is realized regardless of drone operator's skill.

Comparison between 3D model image and real photo

Advantages of DRONESNAP

- ✓ Stable quality is achieved as the pictures are taken from the same angle of view by anyone.
- ✓ No operating skill is required and anyone can easily take the required pictures for an inspection.
- ✓ Easy year-to-year comparison due to the pictures from the exactly same angle of view.

Compatible Models of Drone

DJI
- ❖ MATRICE 300RTK
- ❖ MATRICE 30/30T
- ❖ Mavic 3 Enterprise (RTK)

ACSL
- ❖ SOTEN (RTK)

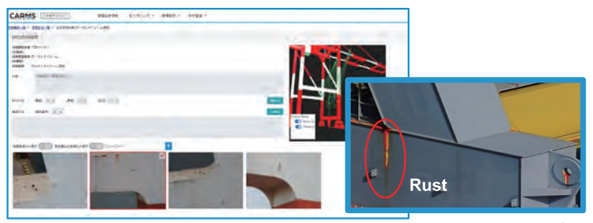
SONY
- ❖ Airpeak S1 (RTK)

*Compatible models are under expanding.

Contact : mes-drone@mes.co.jp

DRONESNAP Cloud

Taken pictures by a drone are easily managed through the cloud application.



Automated image sorting, comparison with previous results, and automated rust detection by AI are available.

CARMS

OITA FACTORY

MITSUI E&S Oita Factory has the annual manufacturing capacities of 36 units of Portainer® and 70 units of Transtainer®, and supplies the cranes to the ports around the world. We perform the entire process such as designing, manufacturing, assembly, and commissioning in Oita Factory to ensure the high product quality. We obtained ISO 9001 and ISO 14001 certifications in 2003, under the philosophy of “contribution to the realization of sustainable society in harmony with the environment.” Besides, we established Transtainer® for the automated development/demonstration as well as its experimental area on the premises to meet the customer’s demand for the automation.

Panoramic View

Upper Structure Jack-Up Tower

Indoor Assembly

Jib Crane

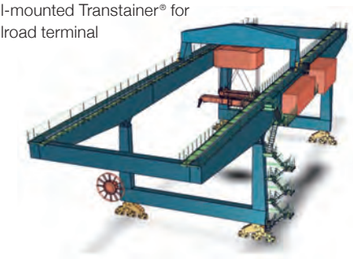
Research & Development

We actively work on developing the new technologies to supply the suitable new products for a variety of the customer needs. Specifically, we have released the new concepts in the container crane business to lead the future of the container logistics industry, in cooperation of PACECO® CORP. At the same time, we have developed the products with the new technology which are focused on the high efficiency, the high technology, the sustainability and the safety.

Semiautomated double trolley Portainer® for high efficiency of cargo handling in the automated container terminal

- Supertainer
- Buffer Station
- Large-sized Portainer®
- Yard Chassis Dynamic Assignment System

Automatedly / remotely operational rail-mounted Transtainer® for railroad terminal



- Rail Shuttle
- Automated Transtainer®
- Operation Assist System
- Automated Terminal Operation Management System

High Efficiency

High Technology

R&D

Sustainability

Safety

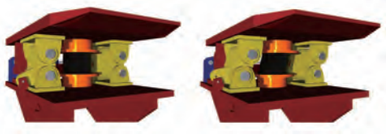
Near Zero Emission Transtainer® achieves zero emission by replacing its power supply to hydrogen FC, in consideration of future hydrogen society

- Hybrid Transtainer®
- Electrical Transtainer® with Auto Plug-in/out
- Sun Shield Device for Reefer Container
- Transtainer® Automatic Arrangement System

Anti-seismic device with easy maintenance adopted to massive earthquake

Normally

On Earthquake

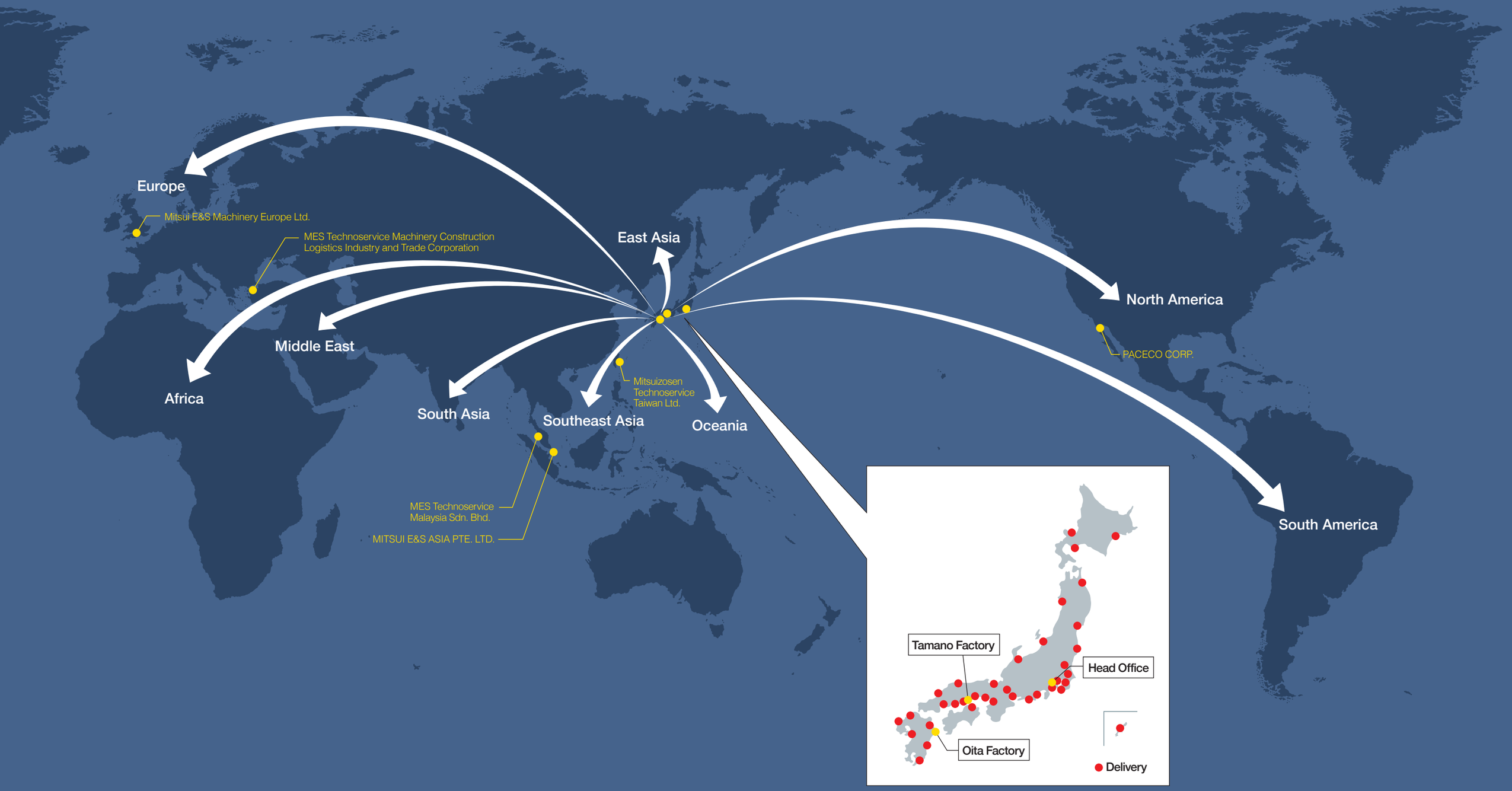


- Anti-Seismic Portainer®
- Anti Collision Sensor
- Chassis Hanging Prevention
- Remote Crane Management System

Factory

Delivery Records and After-Sales Service

We have delivered over 400 units of Portainer® and 1,600 units of Transtainer® to the ports around the world. Our products have established a long-standing good reputation from the customers through our efforts to keep improving our excellent skills, quality, as well as after-sales structure. We always support our customers by offering prompt repair service and on-site maintenance as a whole MITSUI E&S group in order to provide the best quality and service.



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Business & Products　Oita Factory