Komatsu IR－DAY 2018

Parts Operation Reform

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Production Division

Outline of Spare Parts

What is "Spare Parts"

Parts used for inspection, maintenance, repair and service of construction and mining products

Importance of spare parts

Komatsu's products are "Asset for Production" of customers
(If machines stop, production/productivity decrease at sites.)

"Loss in customers' business directly impacts their profitability."

Mission of Parts Business

"Not to Stop Machines"

- **Supply necessary parts when it is needed**

"Keep High Machine Utilization"

- **Promptly Supply Parts when machine is down**

Characteristics of Construction/Mining Products

- **Asset for Production** : If machines stop, customers' business stop.
- **"Life of Machine" is extremely long.**

→ **Continuously supply parts for long time**

Operating Hours of Life

(Total operating hours from purchase to scrap)

Automobile

Consumer's goods

2,500 hours = "100,000km = 40km/h x 10years

Construction Equipment

Asset for Production

12,000hours = 10-15 years of life

2,500 hours	2,500 hours	2,500 hours	2,500 hours	2,500 hours

vs. Automobile **x5**

Mining Equipment

Asset for Production

75,000hours = 10-20 Years of life

2,500 hours	2,500 hours	2,500 hours	2,500 hours	2,500 hours	2,500 hours

vs. Automobile **x30**

Note: Operating Hours of Life is getting longer more.

Characteristics of Komatsu Products and Parts Supply

Wide Product Range

- Excavate, Dozing, Transport, Level, Crush, Tow etc.
- Very large size – very small size

Bull Dozer

D575A-SD 152.6 ton
858 kw (1,150 HP)

Towing power = 220 horses

General earth working model

D85EXi 30.5 ton
197 kw (268 PS)

D21P 4.3 ton
32.4 kw (44 PS)

Hydraulic Excavator

PC8000
3,000 kw (4,020 HP)
752.0 ton

1 bucket = 300 persons

Urban area model

PC200 19.8 ton
123 kw (168 PS)

"Instead of shovel"

PC01 0.3 ton
2.6 kw (3.5 PS)

Dump truck

980E
2,610 kw (3,500 HP)
625.3 ton

Pay load = 5,600 persons

Quarry site model

HD325 70.8 ton
386 kw (525 PS)

On-road dump truck (13 ton)

Various Working Environment

- Mine, Dam and road, Urban, Loading at port, Farm, Garden
- -60℃ - +50℃, Very cold/hot, Dry/wet area
- Jungle – Desert – Mountain area
- High – Low – Tunnel – Under ground (Land – River – Sea)

Long Product Life

- Construction: 15 years' parts supply after sales
- Mining: 25 years' parts supply after sales

Supply necessary parts at necessary timing at customers

Parts Business Organization

Organization for Equipment

Equipment Production Plants
- Procurement
- Inventory control
- Manufacturing
- Logistics

→ Production Div.

Equipment Sales/Marketing
- Marketing
- Pricing
- Distributor strategy
- Global contract

→ CE Marketing Div., Mining Div.

Organization for parts - FY2012

- Parts organization for total operation from procurement to distributor support

- Apply machine organization to parts
- Apply machine plant knowhow to parts

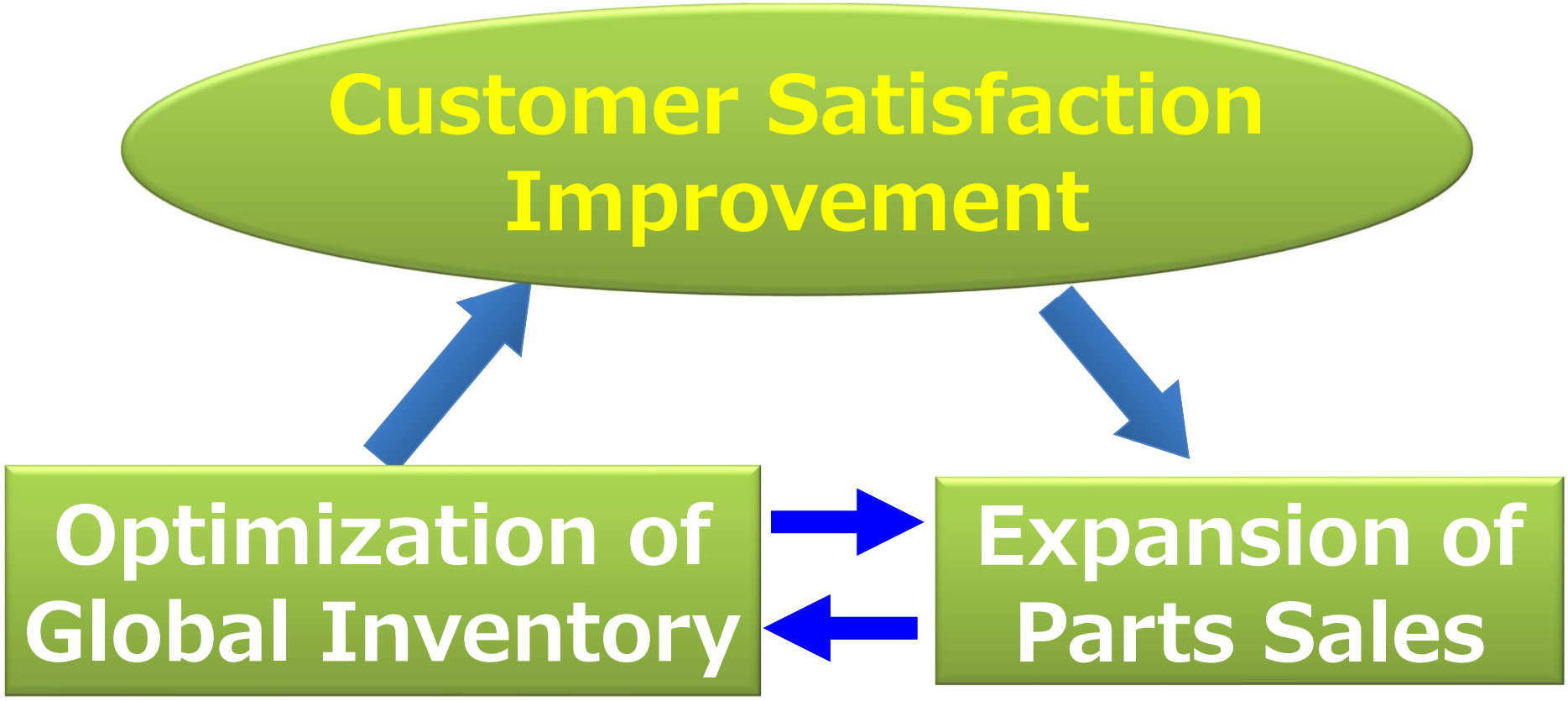
Marketing Div.

Parts organization
- Procurement
- Inventory control
- Manufacturing
- Logistics/Warehouse
- Reman
- Marketing
- Pricing
- Distributor support

Parts Operation → Production Div.
- Procurement
- Inventory control
- Manufacturing
- Logistics/Warehouse
- Reman

Parts Sales/Marketing → CE Marketing Div., After Marketing Div.
- Marketing
- Pricing
- Distributor support

Parts business reform concept



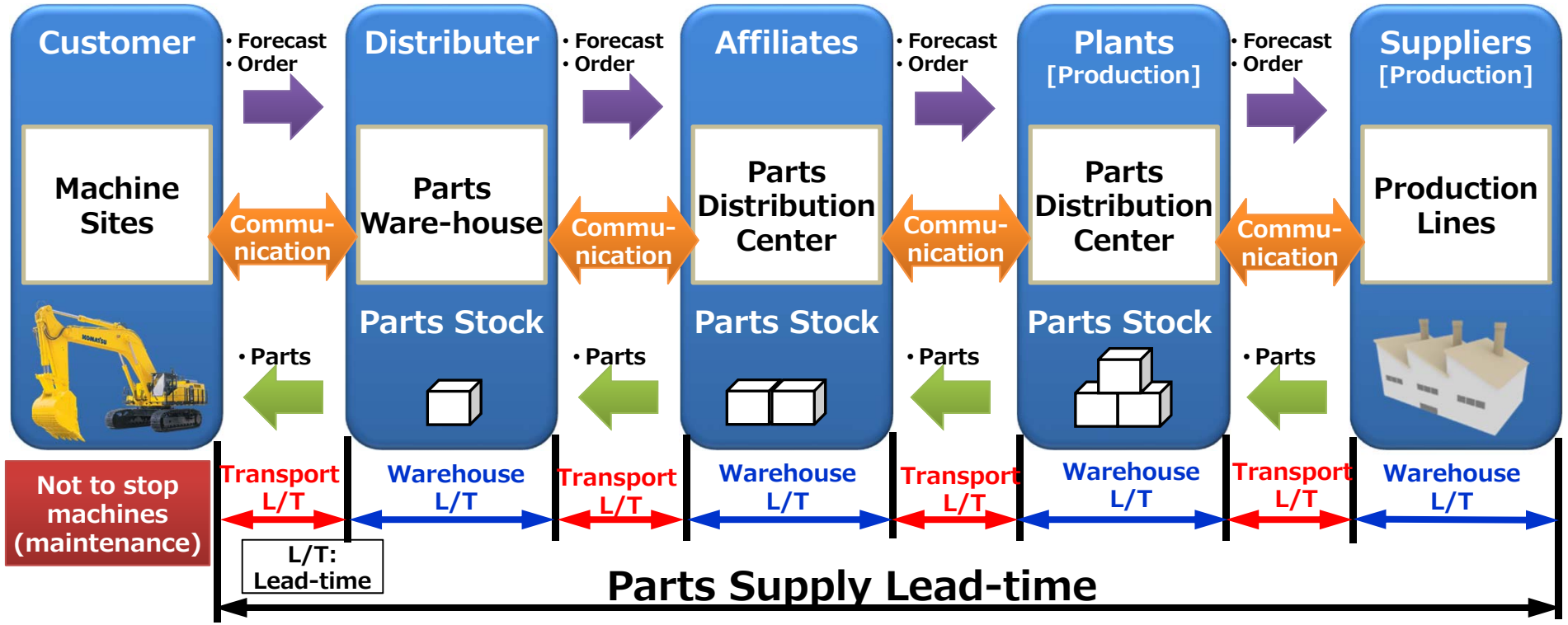
Activities to prevent stop of machines:

- **Global Communication among all Parts Operations**
- **Improve one by one by crossing departments group wide**

Improvement Parts Order & Supply Chain

- Direct Operation: Demand Forecast and Parts Order
- Shorten Lead-time by Process Improvement

Information
Parts Supply



[Improvement Activities]

- Globally unify demand forecasting, planning and ordering
- Communicate among distributors, parts distribution center and plants weekly/monthly basis.
- Monitor supply chain and solve problems immediately

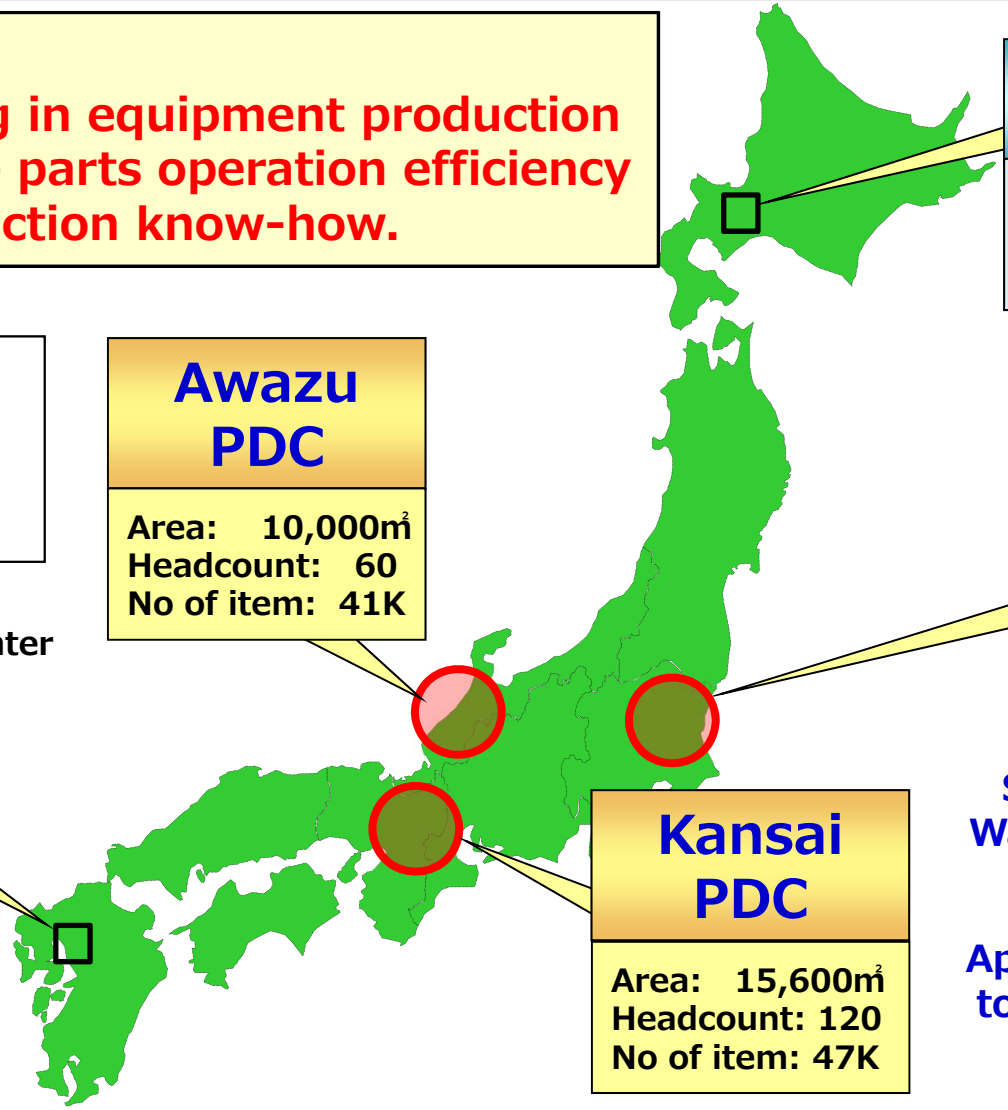
Parts Operation Reform

Parts Supply Network in Japan

[Concept]
PDC's are locating in equipment production plants to improve parts operation efficiency by utilizing production know-how.

[Japan total]
Area: 50,000㎡
Headcount: 400
No of item: 210K

PDC:
Parts Distribution Center



Hokkaido Depot
Area: 1,702㎡
Headcount 9
No of item: 12K

Awazu PDC
Area: 10,000㎡
Headcount: 60
No of item: 41K

[New]
Kanto PDC
Area: 22,000㎡
Headcount: 210
No of item: 97K

Kyusyu Depot
Area: 1,200㎡
Headcount: 9
No of item: 14K

Kansai PDC
Area: 15,600㎡
Headcount: 120
No of item: 47K

Standard Model of Warehouse Operation

Apply Standard Model to Komatsu Affiliates

- **Communicate weekly/monthly among Japanese Plants, Parts Operation Div. and Komatsu Customer Support.**

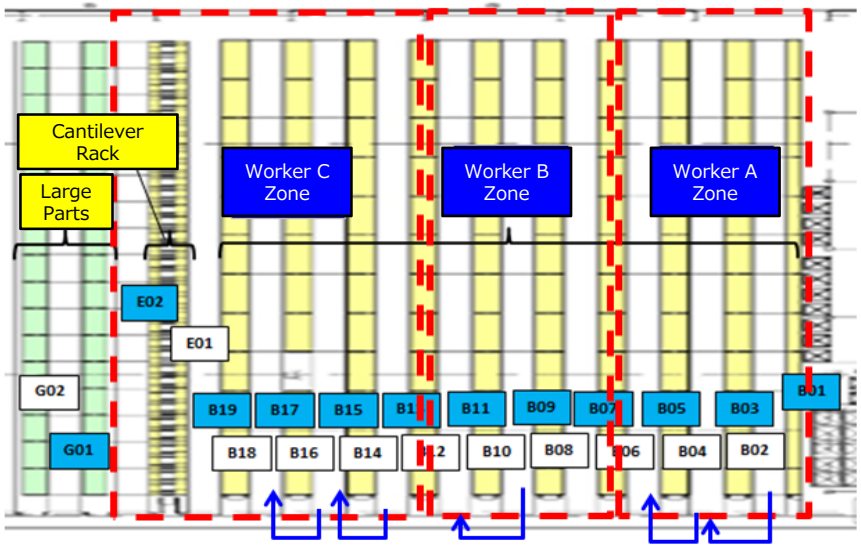
Kanto PDC Safety Features

■ Apply safety features to warehouse by Plant know-how

[Indicator for Man in Rack Area]

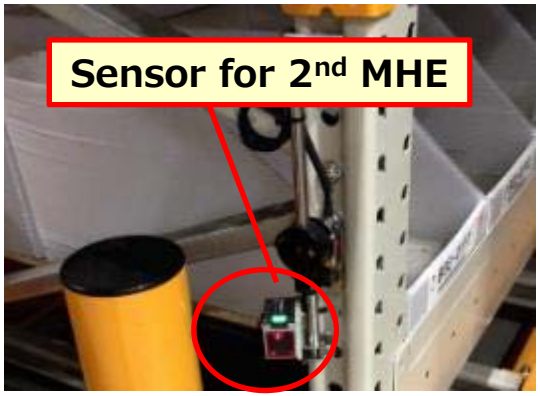
MHE: Material Handling Equipment

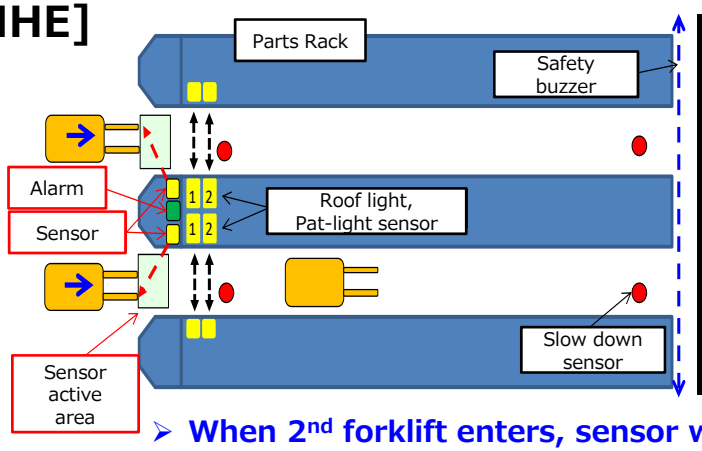
[Segregating Worker Operating Zone]

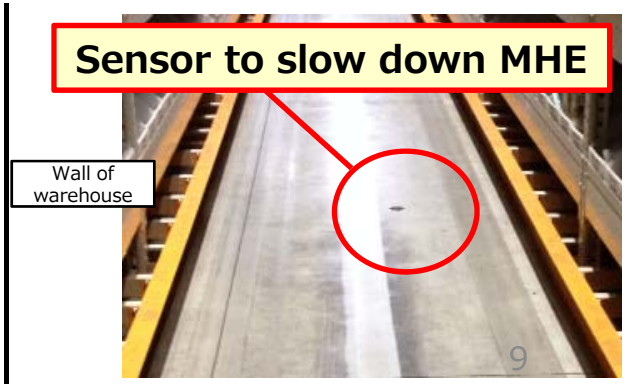


➢ **Set zone by worker, avoid interference each other**

[Prevention of multiple MHE]





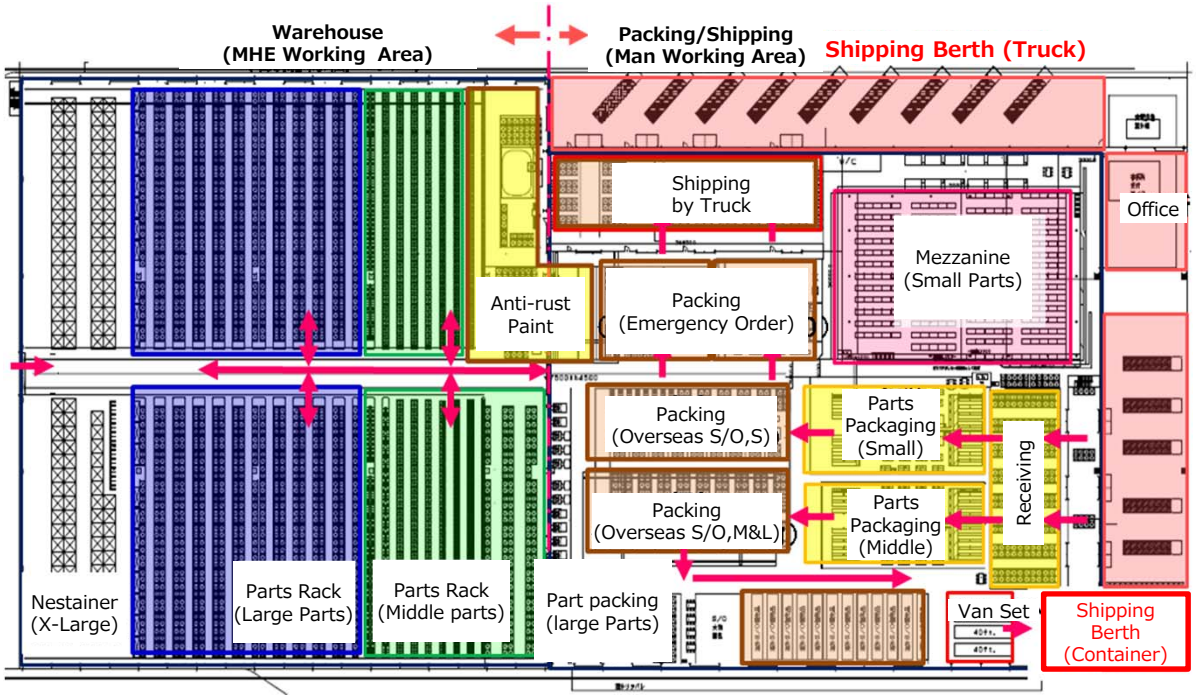


➢ **When 2nd forklift enters, sensor works and reduce speed automatically.**

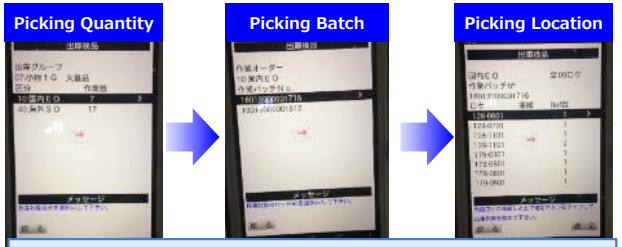
Kanto DC ICT devices

State of the art warehouse operation with latest ICT devices

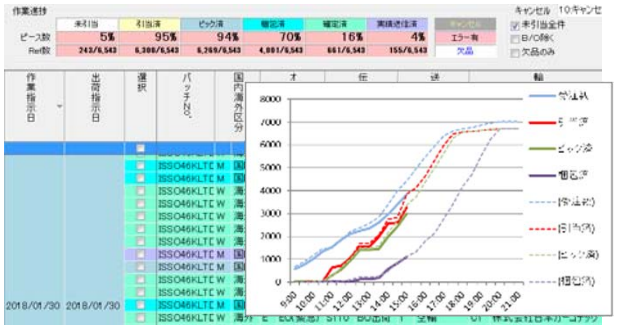
[Warehouse Layout]



Display Picking Priority

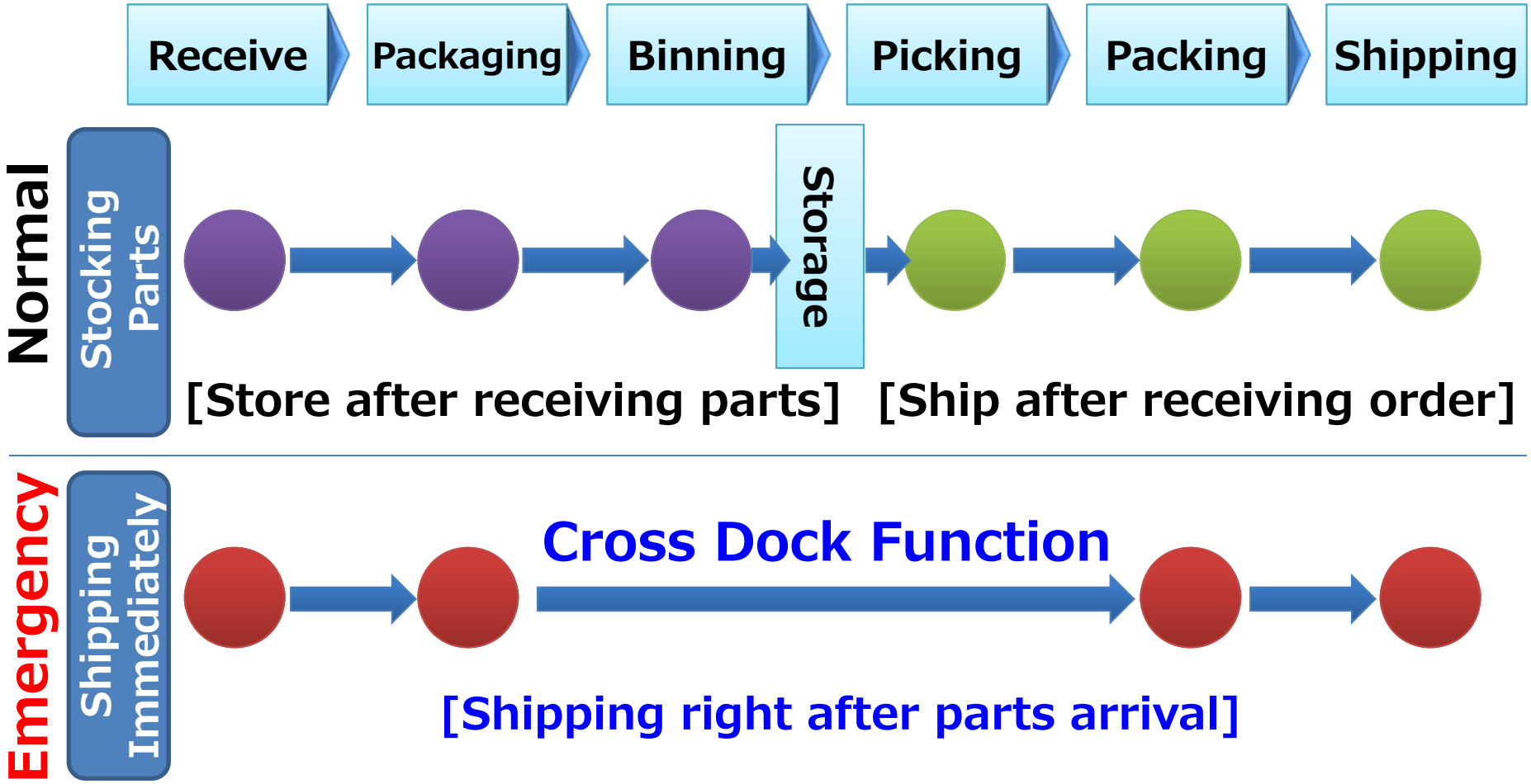


Working Plan/Status Control



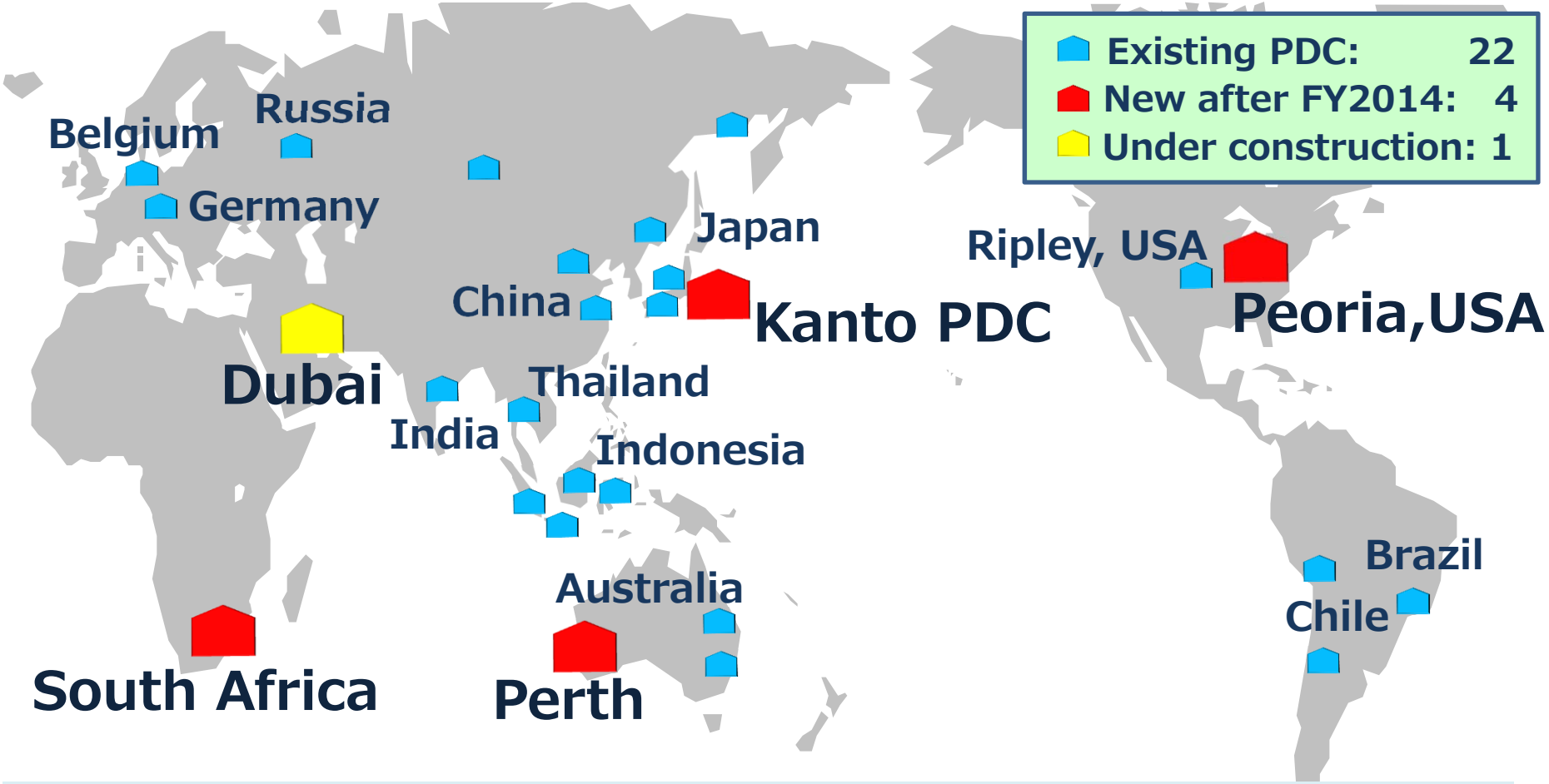
Warehouse Process improvement

- Shorten stocking period by procurement/shipping planning
- Minimize lead-time from receiving to ship for emergency case by cross dock function



Global Parts Operation Network

- Globally expand warehouse operation model of Kanto PDC to Komatsu affiliates



Merit: Simultaneously apply operation improvement world wide.
-> Continuously standardize operation by expanding model more.

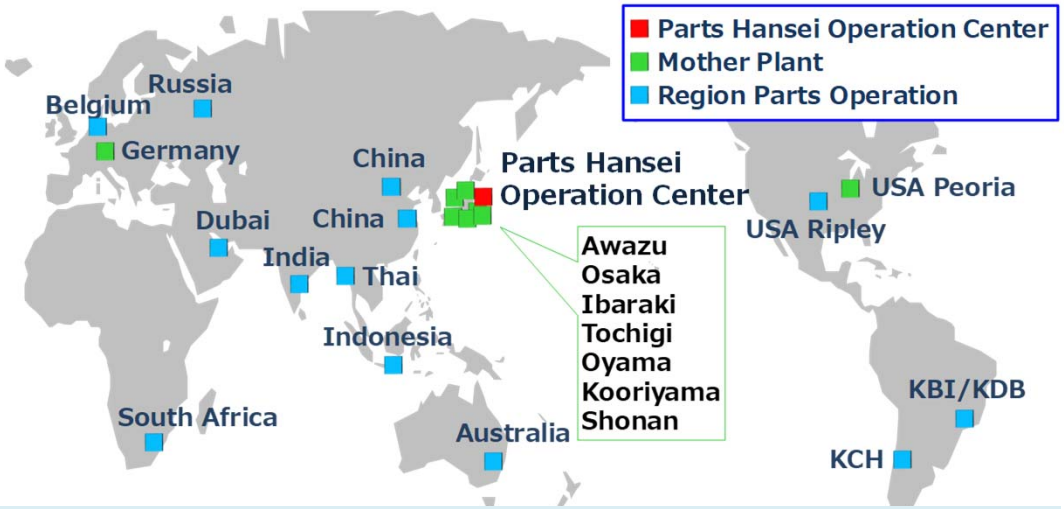
Parts Hansei Operation Center

- Monitor parts supply chain globally and find issue
- Optimize inventory by looking sales/production situation

→ **Quick Action**

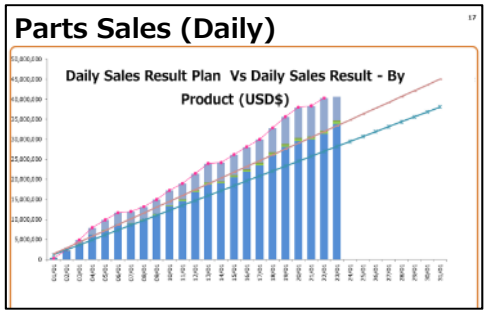
[Parts Hansei Operation Center]

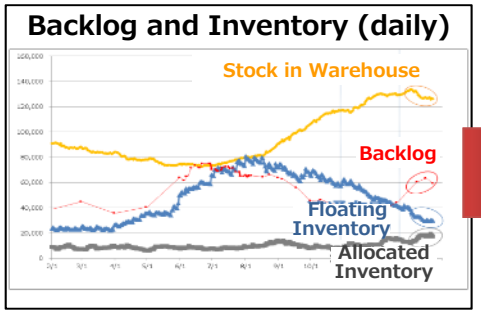
[Global operation network]



Weekly/monthly communication meeting among mother plants, Parts Operation Div. and overseas affiliates, to improve global operation.

[Han-Sei-Zai monitoring and actions]





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Actions

- Sales increased, and inventory reduced and then backlog was increased, then action was taken with affiliate to add more inventory and reduced backlog.