

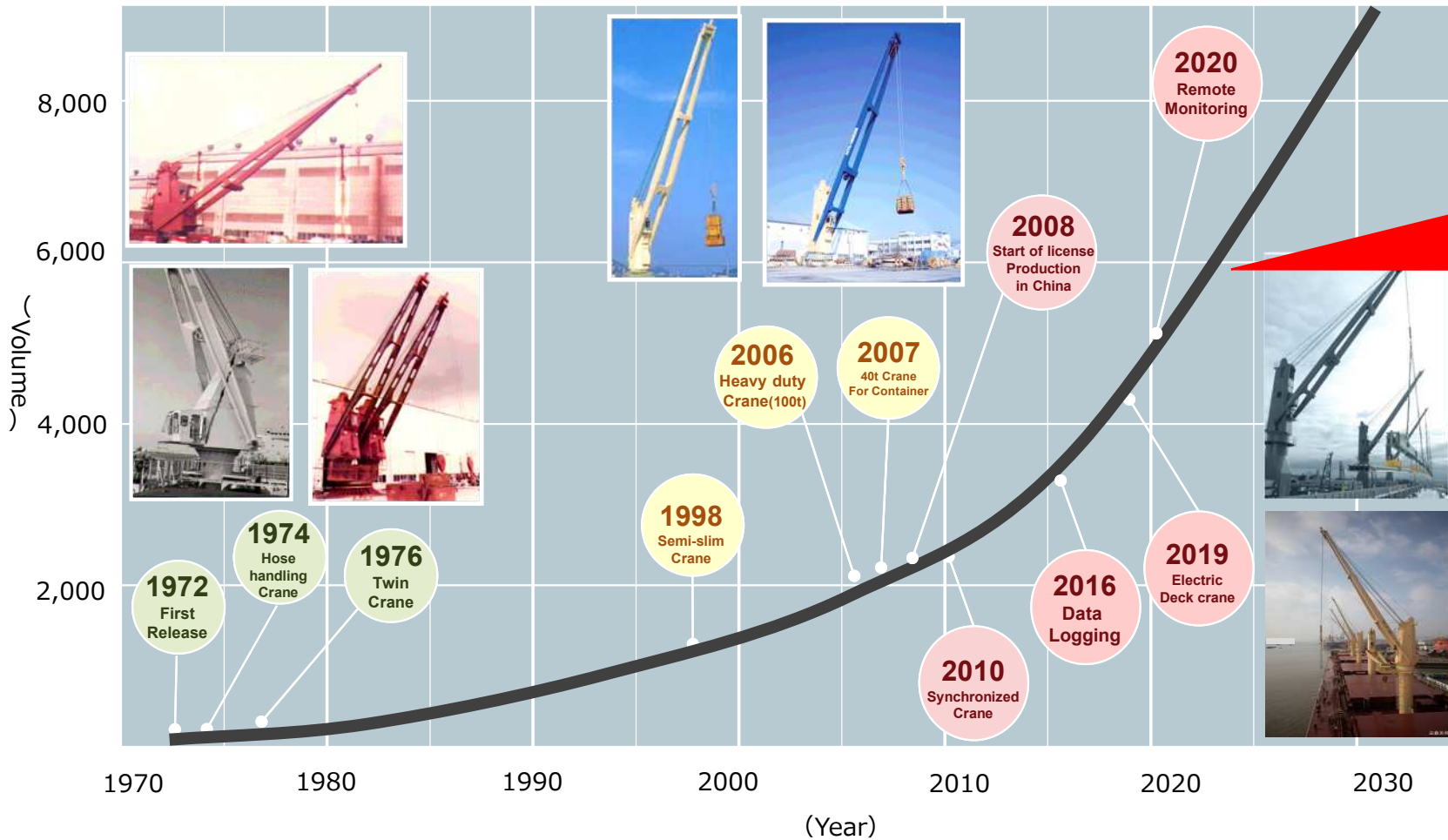
# Introduction of Mitsubishi deck cranes and Option for specific cargo handling

2024/3/21 MHI-MS20240321YKE

Mitsubishi Heavy Industries Machinery Systems, Ltd.

# 1. Introduction of MITSUBISHI deck cranes

## 【History of Mitsubishi deck crane】



In 2023, Inclusion of 9,000 units delivery breakthrough!!

# 1. Introduction of MITSUBISHI deck cranes

**Mitsubishi, as a top market share manufacture, will continue to support the world's maritime transport by providing best quality products.**

☞ **Stable supply** to two major markets, Japan and China

⇒ 【Jiangsu Masada Heavy Industries Co., Ltd】

- Licensing (2008~)
- Consignment Production (2018~)



☞ **Flexible response to customers' needs**  
with simple design and a variety of options

⇒ **SMART UP-GRADE**

Jiangsu Masada Heavy Industries, ↗  
which licenses and consigns production.→



☞ **After service network with global reach**

After-sales service technical exchange meeting  
with overseas Authorized Repair Agents.→



## 2. Mitsubishi deck crane's merit and lineup

### 【Advantages of Mitsubishi deck crane】

#### Reliability based on a simple design concept

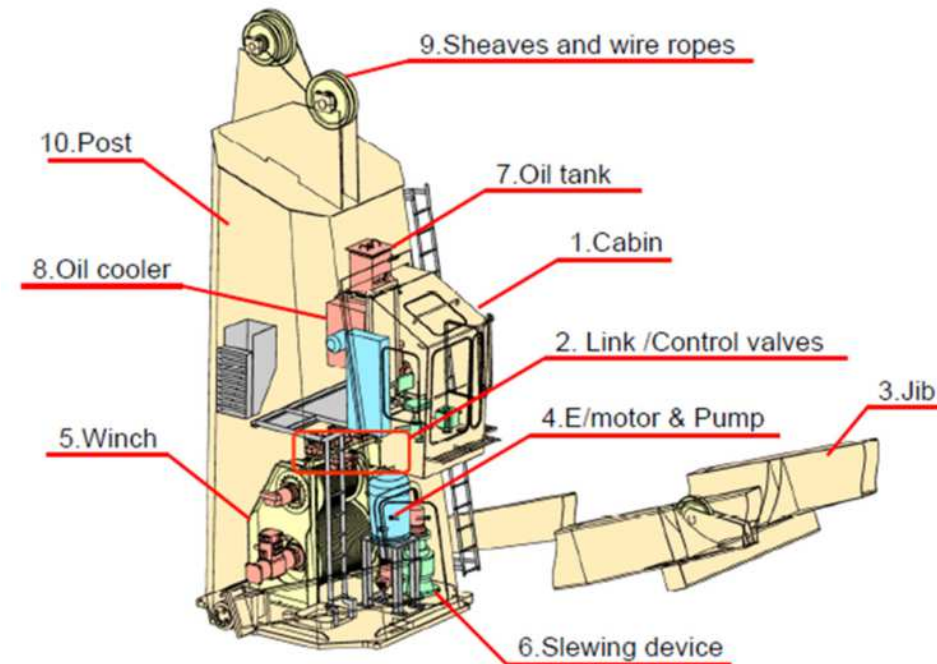
- Intuitive operation with mechanical link operating handle
- Simple hydraulic system adopted

#### High maintainability





- Location of major components at low crane posts for easy access.
- Split bearing box for easy replacement of sheaves

#### High functional cranes that can use operational record data.

- Data Logging  
⇒ Compatibility of "Reduced life-cycle cost" and "High functionality".

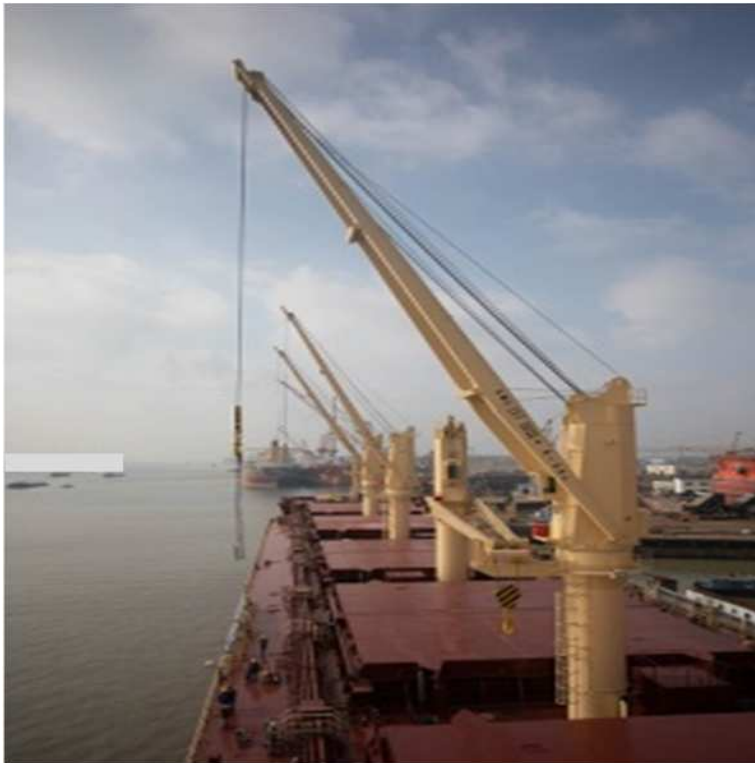


## 2. Mitsubishi deck crane's merit and lineup

Standard Type	Heavy Duty Type	Slim Type For Container	Electric (VFD) Type	Twin Crane
				
30T	50T	40T	36T	60T(30T*2)
36T	100T			70T(36T*2)
40T				

### 3. Latest initiatives

#### 1) Reducing environmental impact: Mitsubishi electric deck cranes with excellent energy efficiency



☞ Adopts Variable Frequency Drive system and high-efficiency motors, inverters.

☞ **Power consumption reduced by up to approx. 40%**  
through regenerative power. (compared to Electro-hydraulic deck crane )

☞ **No use of hydraulic oil**  
✓ No hydraulic circuits and no hydraulic oil  
⇒ Environmental pollution free

- ✓ First deck crane already delivered in 2019.
- ✓ Adopted by later series ships.



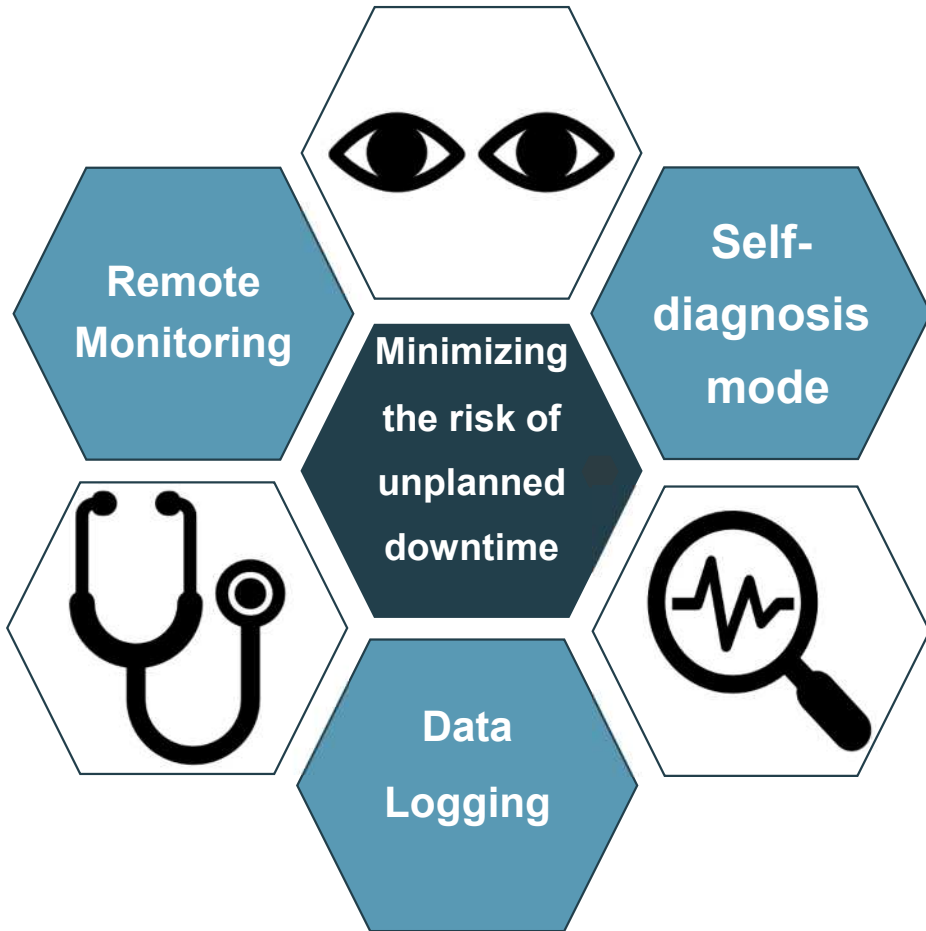
## Environmental initiatives





# 3. Latest initiatives

## 2) Minimize the risk of downtime by unexpected mechanical problems



CONDITION

OPERATION MODE

HOOK GRAB BRASS MODE P/S TEST MODE

SPEED & PRESSURE

[HOIST] PRESSURE 7%  
[HOIST] SPEED 0%  
[LUFF/SLEW] PRESSURE 14%  
[LUFF] SPEED 0%  
[SLEWS] SPEED 0%

SAFETY DEVICE

OVER LOAD	OIL TEMP HIGH	OIL LEVEL LOW
OIL TEMP LOW	MOTOR OVER LOAD	
[P] SLACK OF WIRE	[H] UPPER LIMIT	[P] LOWER LIMIT
[L] SLACK OF WIRE	[L] UPPER LIMIT	[L] LOWER LIMIT
DIFFERENTIAL LIMIT	[L] REST LIMIT	[L] LOWER2 LIMIT

EVALUATION

OPERATION EVALUATION

SMILEY FACE > < X X

SIMULTANEOUS 2-OPERATION 14%  
SIMULTANEOUS 3-OPERATION 0%  
HIGH PRESSURE 0%

OPERATION HOURS

HOOK	9 [HRS]
GRAB	0
IDLE	3
TOTAL	15
HOIST	6 [HRS]
LUFF	2
SLEW	2
TOTAL	10

AVE. CARGO CYCLE 0 [C/CY/HRS]

AVE. RAPID OPERATION 0 [NUM/HRS]

AVE. RAPID PRESSURE CHANGE 0 [NUM/HRS]

Condition and usage centrally managed on PC in the bridge.

Also displays load handling times by mode and by operation.

## 4. Smart Upgrade (1)

# SMART UP-GRADE

Various options are available for the individual needs arising from the customer's cargo operation environment.

### Propose the best customization

- Responding to the needs of each handling
- Improve the cost-benefit performance



### Increased functionality of cranes

- High performance of standard specifications
- Next generation management using cargo handling data.  
⇒ Data Logging Advance(DLA)

Less "life-cycle cost"

Less "Claims from stevedores"

Expansion of "Support for CREW"



## 4. Smart Upgrade (2)

### 【Data Logging Advance(DLA)】

(Standard Specification)

- Recording
- Uptime
  - Operating mode
  - Handling Operation



**Oil pressure**  
**Operating speed**



### 【Load Indicator for Cabin】

- Visual confirmation of the lifting load.
- **Easy** and **inexpensive** to install



- Alarming (prevention) of overloading
- **Providing the evidence for overload operation for stevedore claims.**



### *Introduction to various plans*

(References for the part of SMART UPGRADE Options)

### 【Line Filter Unit (For Cleaning Hydraulic Oil)】

- Two types of products are available.  
( In-Line type / Off-Line type )
- Portable / Simple installation
- **Up to 3μ** can be captured!!



Reduction of risk of **hydraulic equipment damage** and **hydraulic oil costs.**

### 【High Cycle Corresponding type Control valve】



- Enhanced neutral function also incorporated inside the control valve.



**Improved parts durability against repeated operation.**

## 4. Smart Upgrade (for deck crane's trouble :case1)

### Enormous expense for the Unexpected Downtime is big issue...



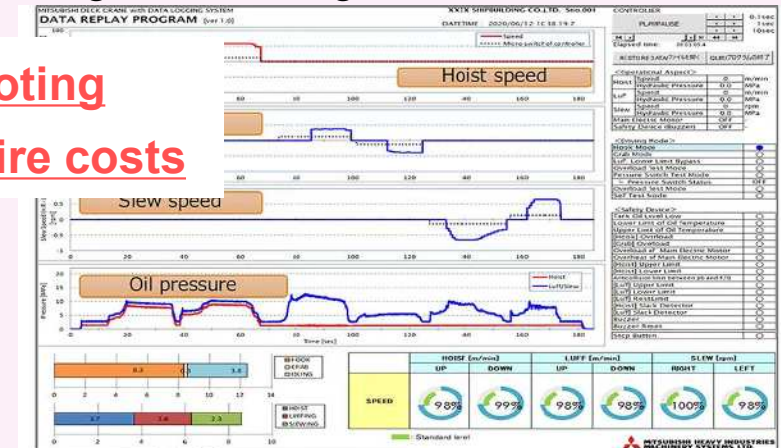
Engineer and ship crews are seeking for the proper and quick technical advises for the trouble shooting.  
→ It is essential to identify the cause of trouble remotely and to minimize the recover period.

### Data Logging Advance(DLA)

✓ Recording of operating data during trouble.

👉 **Quick trouble shooting**

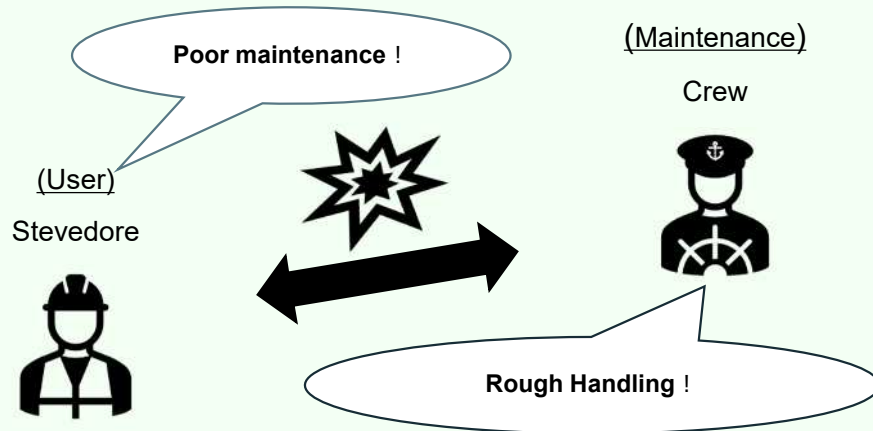
👉 **Reduction in off-hire costs**



## 4. Smart Upgrade (for deck crane's trouble : case2)

### Off-hire costs occurs when cargo handling stops ...

- Ambiguity of responsibility for the trouble cases.  
⇒ Maintenance issue or Operation issue?



### 💡 If an load indicator is adopted...

- ✓ Visual confirmation of the lifting load from cabin
- ✓ It helps to identify the cause of the following troubles.

- 👉 Alarming (prevention) of overloading
- 👉 Prevention of the stevedore's claim
- 👉 Early identification of pump's deterioration

- Display of pressure gauge and rated pressure to convert drive pressure to load during hoisting operation.



## 4. Smart Upgrade (for deck crane's trouble : case3)

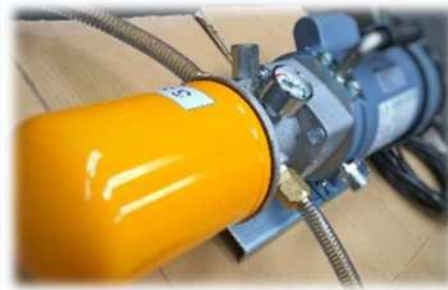
### Concerns about hydraulic oil cleanliness control...

✓ Serious contamination of hydraulic oil can lead to damage the hydraulic equipment... (By the time found the serious oil contamination, it is too late...)

#### 💡 If **off-line filter** unit is adopted...

👉 Hydraulic oil management with Just one unit of Off-line filter!

- Up to 3 $\mu$  can be captured.
- Better cleanliness than NAS class grade 7<sup>th</sup>.
- Portable / Simple installation



#### 💡 If **in-line filter** unit is adopted...

👉 Adopted at High pressure line, enables cleaning during loading. No work by the crew is required at all!!

- Moisture can also be captured.
- Better cleanliness than NAS class grade 8<sup>th</sup>.
- Applicable to both newbuilding vessel and vessel in service.



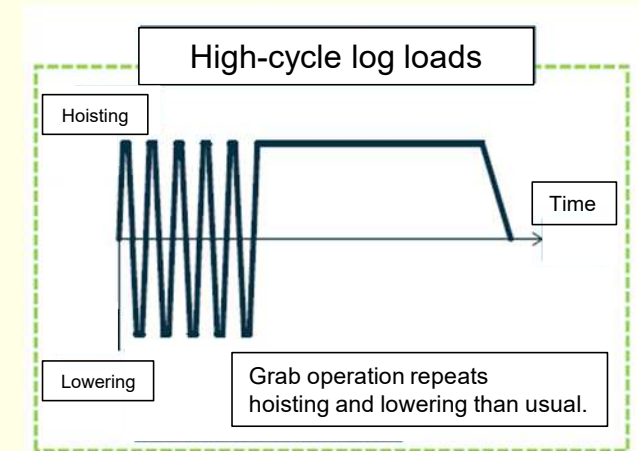
## 4. Smart Upgrade (for deck crane's trouble : case4)

### Concerns about component abrasion due to high-cycle operation of log operation...

High-cycle operation of log operation (Repeated operations of hoisting and lowering)

⇒ Tens of times higher load than normal handling may lead to...

- ☞ Early wear of parts (Ex: Broken spring in control valve)
- ☞ Attenuation of neutral function for control handle
- ☞ Stevedore claim and off-hire



### 💡 If High Cycle Corresponding type Control valve is adopted...

- Enhanced neutral function also incorporated inside the control valve.  
⇒ No need to care for existing neutral function !

☞ Preventing problems and reducing maintenance costs

## 5. Conclusion

Please feel free to contact **Mitsubishi** if you have any queries!!

### Examples of user's voice

### Value provided by Mitsubishi

Want to reduce problems with cargo handling.

**SMART UP-GRADE**

Deck cranes need to be procured with a stable delivery date.

Production system as a manufacturer  
with the top market share

Needs new technology to support cargo handling.

Data Logging & Remote Monitoring

Environmental considerations also need to be taken into account...

Electric deck crane







For enquiries about Mitsubishi Deck crane, please use the QR code below.

(New Product / Product Information)



(After Service / Machine trouble)



Mitsubishi Heavy Industries Machinery Systems, Ltd.