SHIBATA

*Marine Fenders Since 1961*

# 10th SOUTHERN ASIA
## Ports, Logistics and Shipping 2015

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

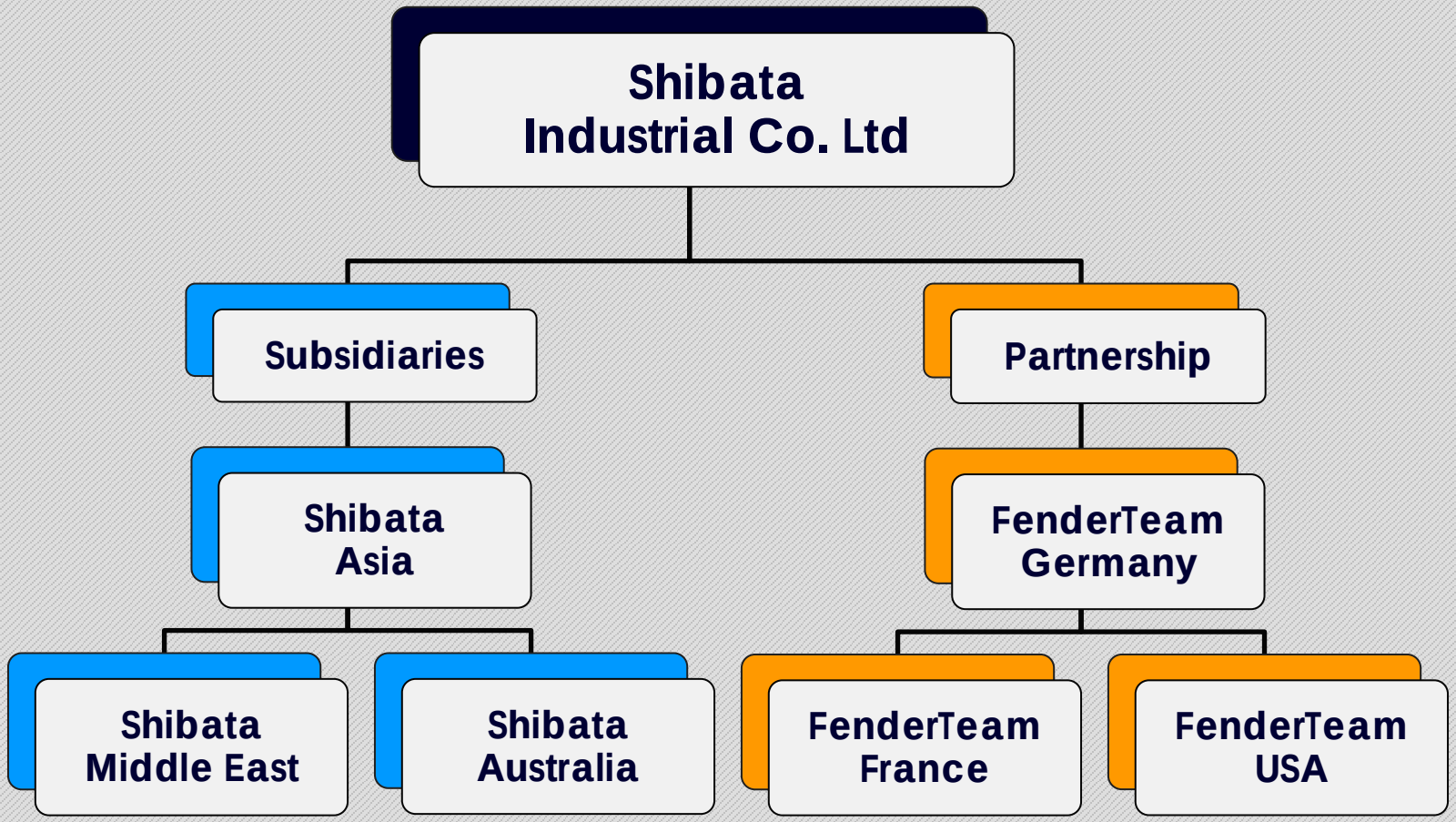
# SHIBATA AT A GLANCE

- 50 years experience manufacturing marine fenders
- Complete range of fenders (Cell, Cone, Arch, Floating, PMF)
- Fender sizes ranging from 150mm to 3000mm
- Extensive sales and support network
- Full technical support, pre and post sales
- Type Approved (CSS and SPC Types)
- Compression tested in accordance with PIANC : 2002
- Worldwide distribution network

# EXAMPLE CELL AND CONE FENDERS

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

## STRUCTURE



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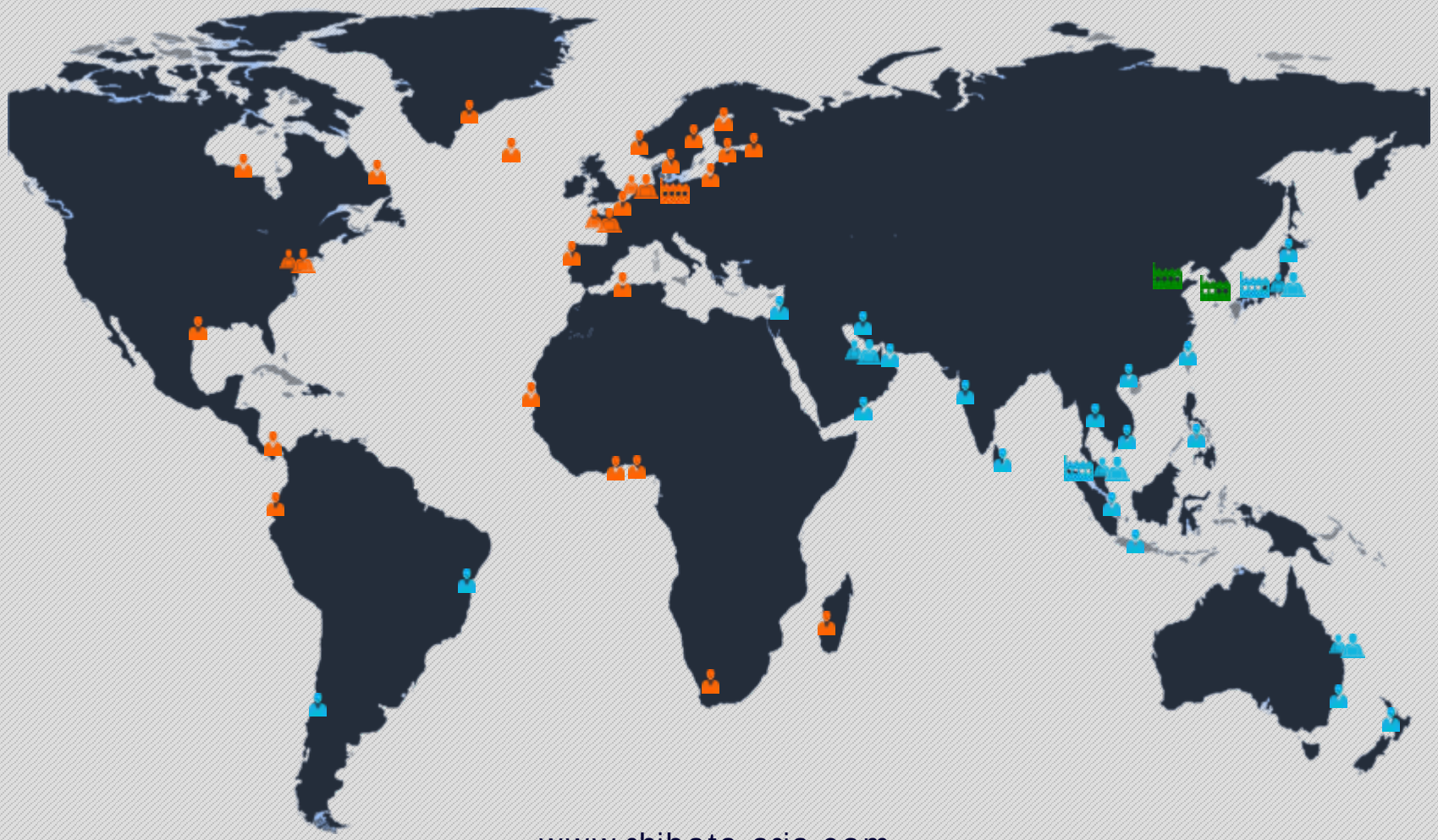
## SALES NETWORK



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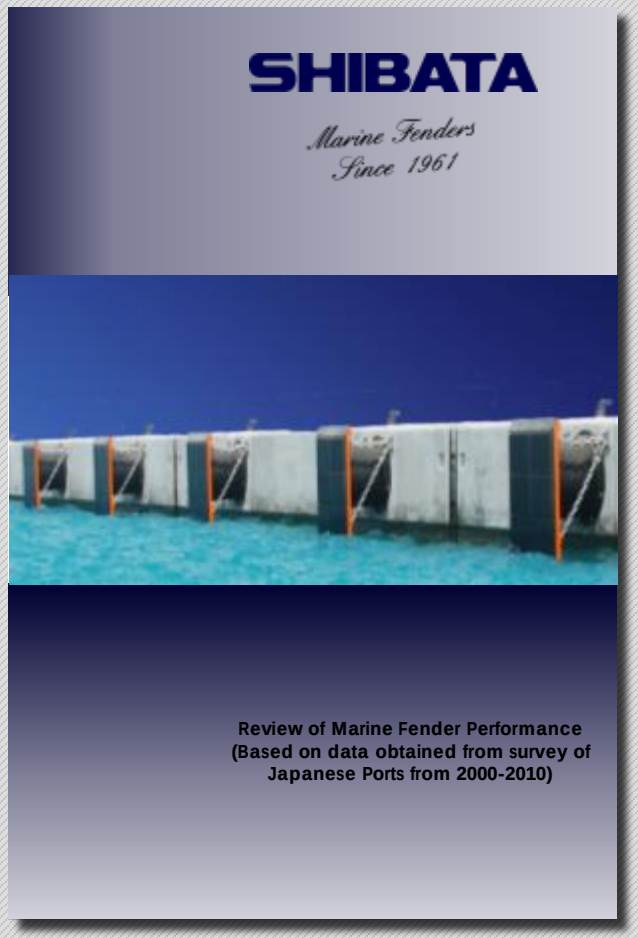


## Review of Marine Fender Performance

- Surveyed fenders at 778 Berths in Japan
- Survey ran from 2000 to 2010
- Visual inspection of fenders
- Condition of individual components recorded
- Vessel and berth type also recorded

# SCALE OF DETERIORATION

| Grade | Level of Deterioration | Expected Performance |
|---|---|---|
| 1 | No signs of damage or corrosion | Fender will be able to function adequately |
| 2 | Minor deterioration, non critical | |
| 3 | Small amount of damage, wear of fenders, corrosion of components | Fender able to function, but performance compromised |
| 4 | Moderate amount of damage, small cracks, damaged components | |
| 5 | Significantly damaged fenders, moderate cracks, damaged components | |
| 6 | Severely damaged fenders, large cracks, broken or missing components | Fender unable to function |

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## EXAMPLE 1


**GRADE 4**
**Damage to Fender**
**Compromised**
**Performance**

## EXAMPLE 2


**GRADE 5**
**Damage to Fender**
**Compromised**
**Performance**

## EXAMPLE 3

**GRADE 6**
**Extensive Damage to Fender**
**Limited Performance**

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

## Analysis of Data

- The reported rate of damage of fenders was collated, and analysed based on type of vessel, berth usage and vessel size and location

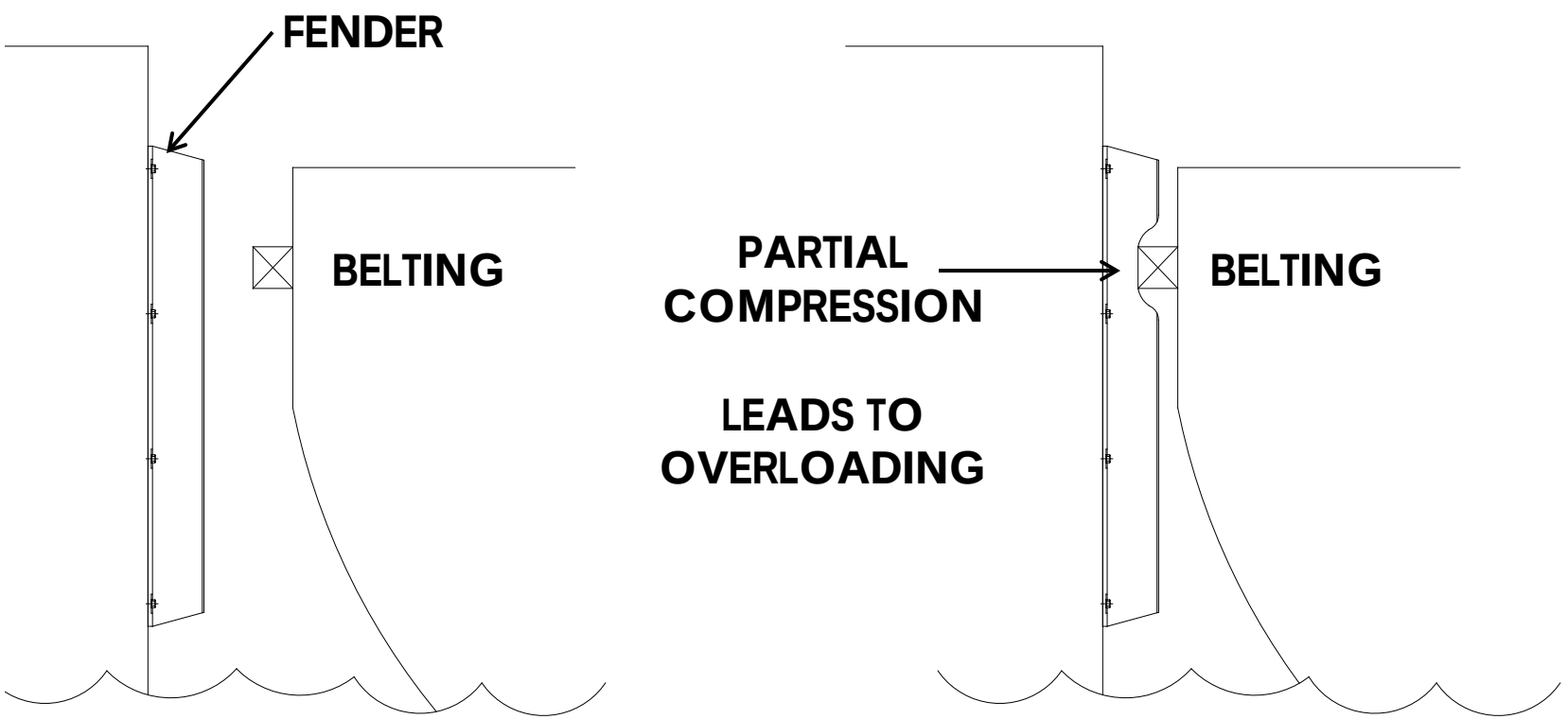
## Report Findings

- Ports with smaller draft had a higher rate of damaged fenders
- Berths catering to General Cargo and Workboats had a higher rate of damaged fenders

## Conclusion

- The rate of damage of fenders at berths with smaller draft (ie smaller vessels) and workboats is due to the partial compression of small fenders by vessel rubbing strakes and beltings, which overloads the fenders

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS



## Damage to the top of fenders is a clear indicator that fenders are being over-compressed

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

## Recommendations

- To ensure that operations continue efficiently and safely, ports should develop a suitable maintenance management system that includes regular inspection and grading of fenders.
- Based on the grading and evaluated functionality of the fenders, appropriate measures should be established to repair or replace fenders and components as required

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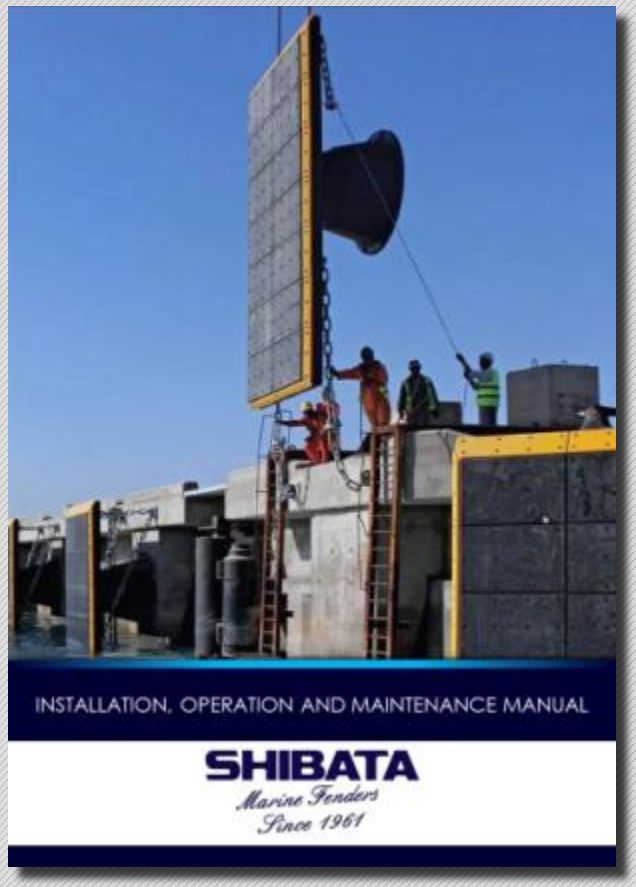


## Installation, Operation and Maintenance Manual

- Complete guidance for installation and operation of fenders
- Recommended practices for fender maintenance, including:
  - Inspection Periods
  - Inspection Checklists
  - Documentation and Reporting

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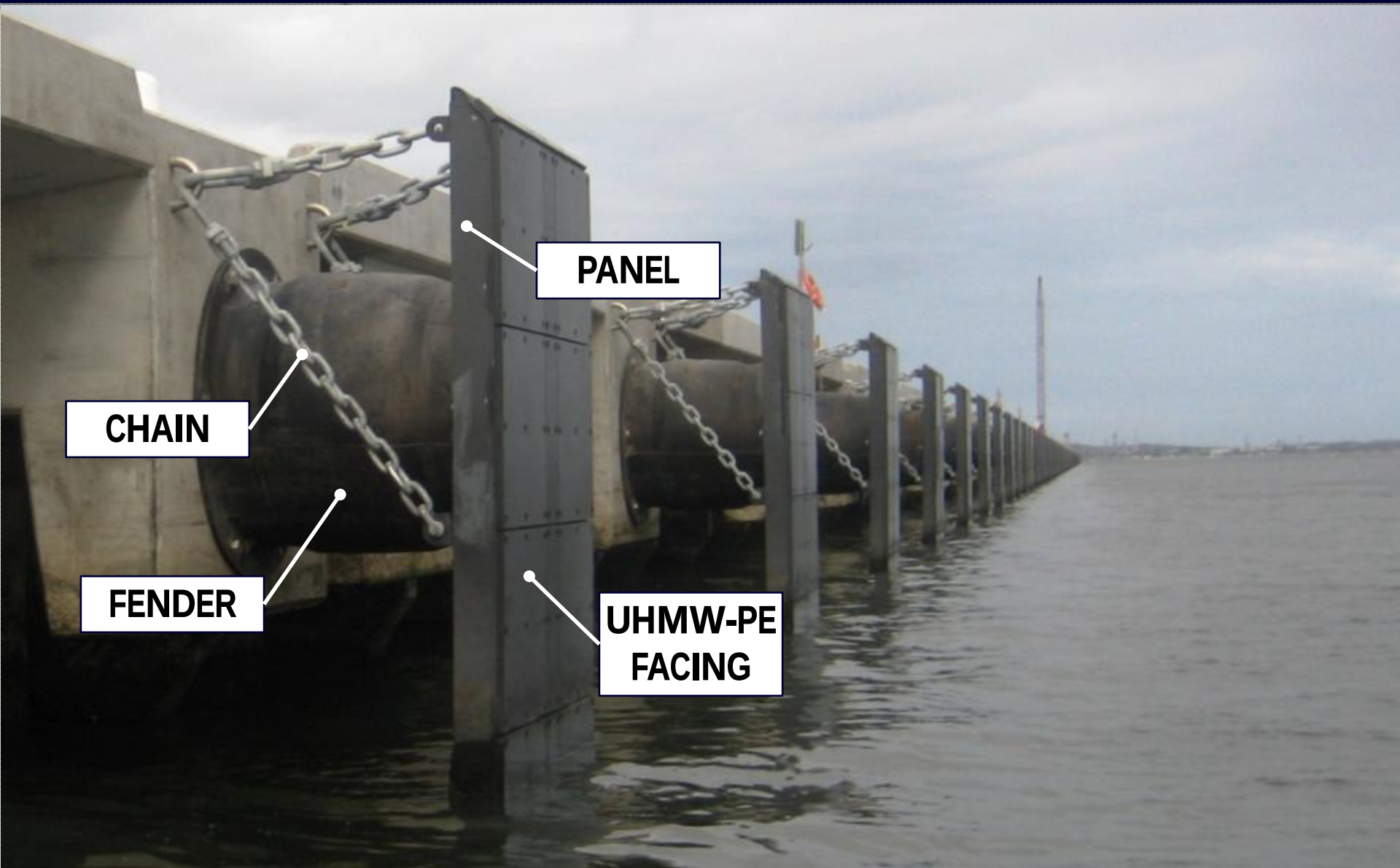

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# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

| INSPECTION AND MAINTENANCE PROGRAM | Level 1<br>close visual inspection | Level 2<br>Interim maintenance | Level 3<br>Major maintenance or overhaul |
|---|---|---|---|
| Rubber fenders | Every year | 4–6 years | 15–25 years |
| Steel panels (frames) | Every year | 4–6 years | 15–25 years |
| UHMW-PE face pads | Every year | 4–6 years | 15–25 years |
| Anchors & bolts | Every year | 4–6 years | 15–25 years |
| Chain Systems | Every year | 2–4 years | 5–10 years |

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# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

| COMPONENT | Vulnerability | Maintenance Required |
|---|---|---|
| Fender | Overloading<br>Long term strain<br>Corrosion (Steel Plates) | Repair minor cracks and exposed plates<br>Maintain support chains<br>Replacement if necessary |
| Steel Panel | Corrosion | Repair paint systems<br>Replaces anodes<br>Overhaul (re-blast and paint) |
| Chain Systems | Corrosion | Tighten adjusters<br>Replacement of components |
| Facing Pad | Wear | Replace damages and worn parts |

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

## Recommended Operating Spares

- Complete Systems (operate during overhaul)
- Components
  - UHMW-PE Pads (especially corner pads)
  - UHMW-PE bolts and washers
  - Chain Systems

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

## *"A STITCH IN TIME SAVES NINE"*

**A maintenance program will:**

- Ø Enable safe and efficient operations at the port
- Ø Reduce the potential for accidents
- Ø Increase the operational life of the marine fenders
- Ø Reduce operational costs

# RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

**FOR COPIES OF EITHER DOCUMENTS:**

***REVIEW OF MARINE FENDER PERFORMANCE***

**or**

***SHIBATA INSTALLATION, OPERATION AND MAINTENANCE MANUAL***

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