SHIBATAFENDERTEAM

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9th Philippine Ports & Shipping 2017

RECOMMENDED PROCEDURES FOR THE MAINTENANCE OF MARINE FENDERS

SHIBATAFENDERTEAM GROUP

HEADQUARTERS	Hamburg, Germany
PARENT COMPANY	Shibata Industrial, Japan
OFFICES	Germany, France USA, Malaysia
PRODUCTION	Rubber fender production in Japan and Malaysia Own steel fabrication facilities in Germany Foam Filled Fender production in Germany and the USA
TURNOVER	~ 40 Million USD
PROJECT SIZES	> 5 Million USD / project > 200 fender systems / project
ACHIEVEMENTS	ISO 9001 / ISO 14001 PIANC Type Approval for std. range

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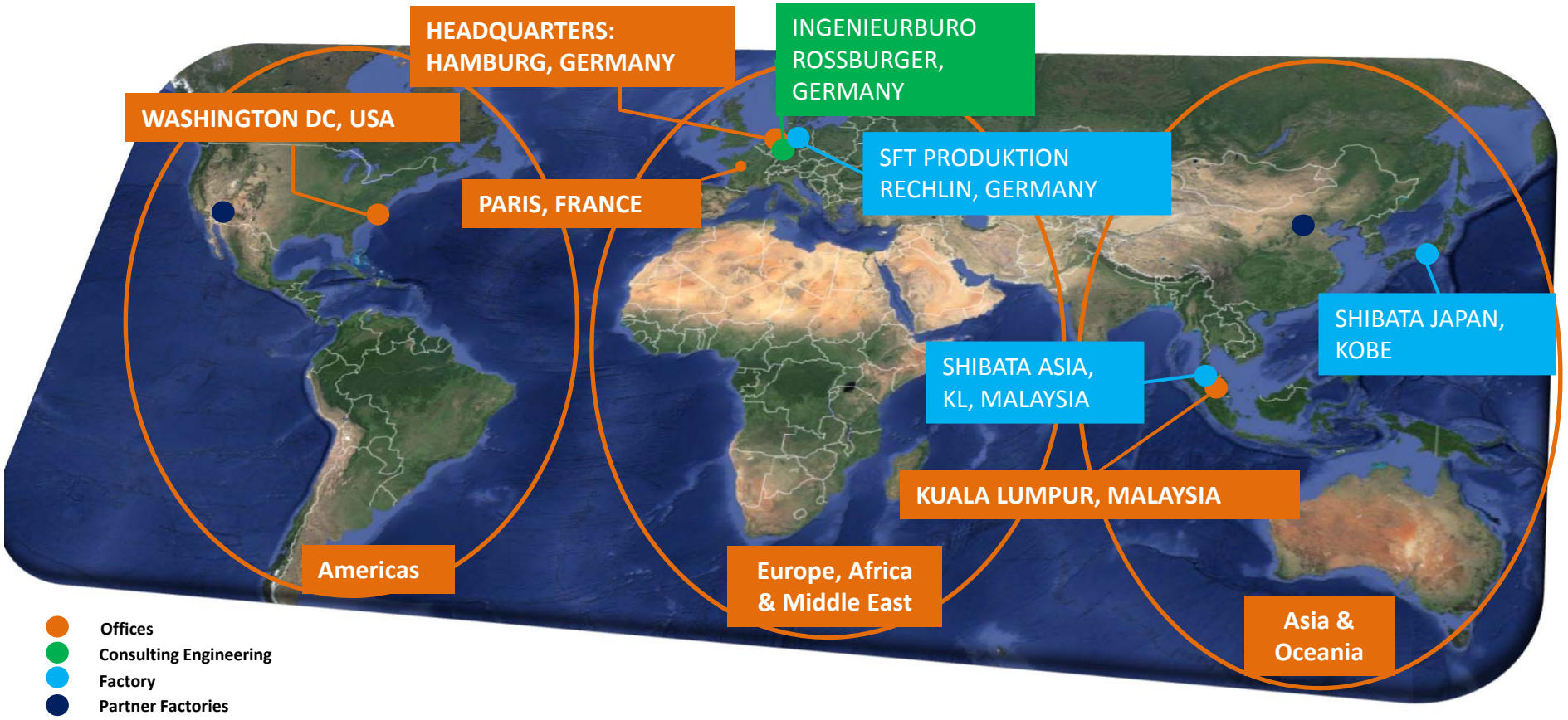

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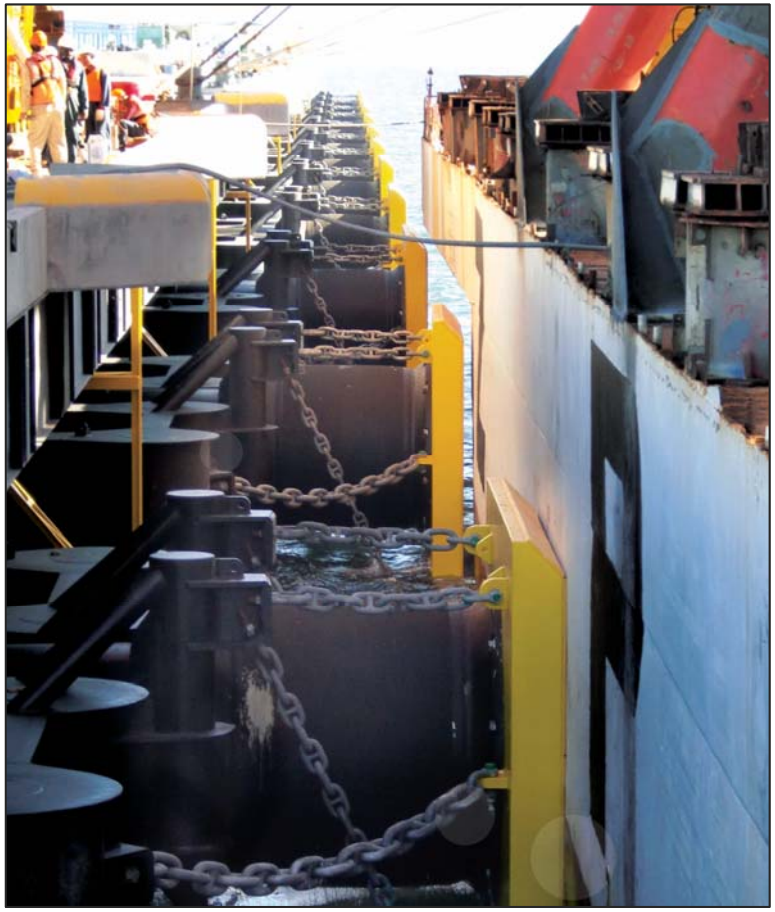
Our strengths

- More than 50 years experience in the supply of fenders
- Worldwide regional offices experienced in Sales, Engineering and Project Management
- Comprehensive network of representatives
- Fabrication facilities in Malaysia (Rubber), Germany (Steel, HDPE, Foam Fenders) and Japan (Rubber)
- ISO Certified company and PIANC Certified products
- Certified designs in partnership with Peter Rossburger engineering
- Complete range of products

EXAMPLE CELL AND CONE FENDERS



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

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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

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

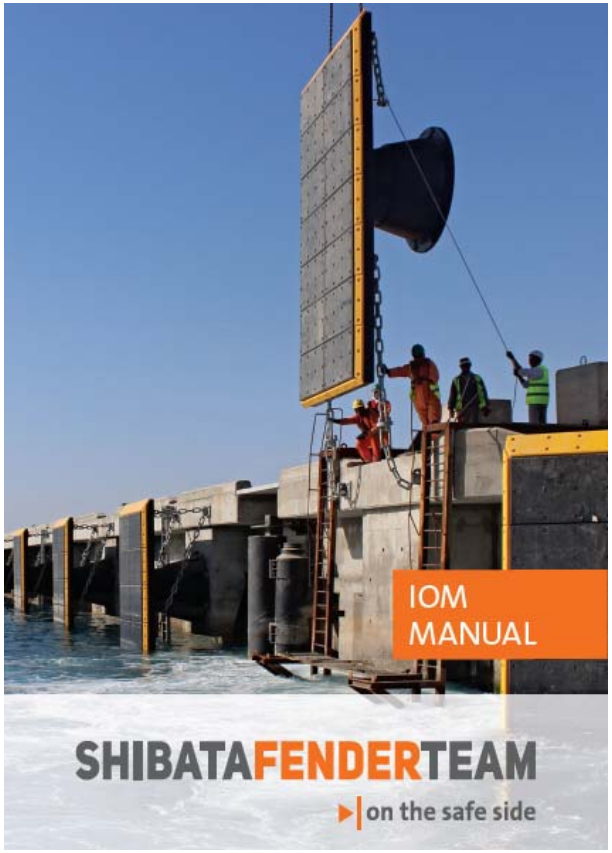
- Ports with smaller draft had a higher rate of damaged fenders
- Berths catering to General Cargo and Workboats had a higher rate of damaged fenders

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

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



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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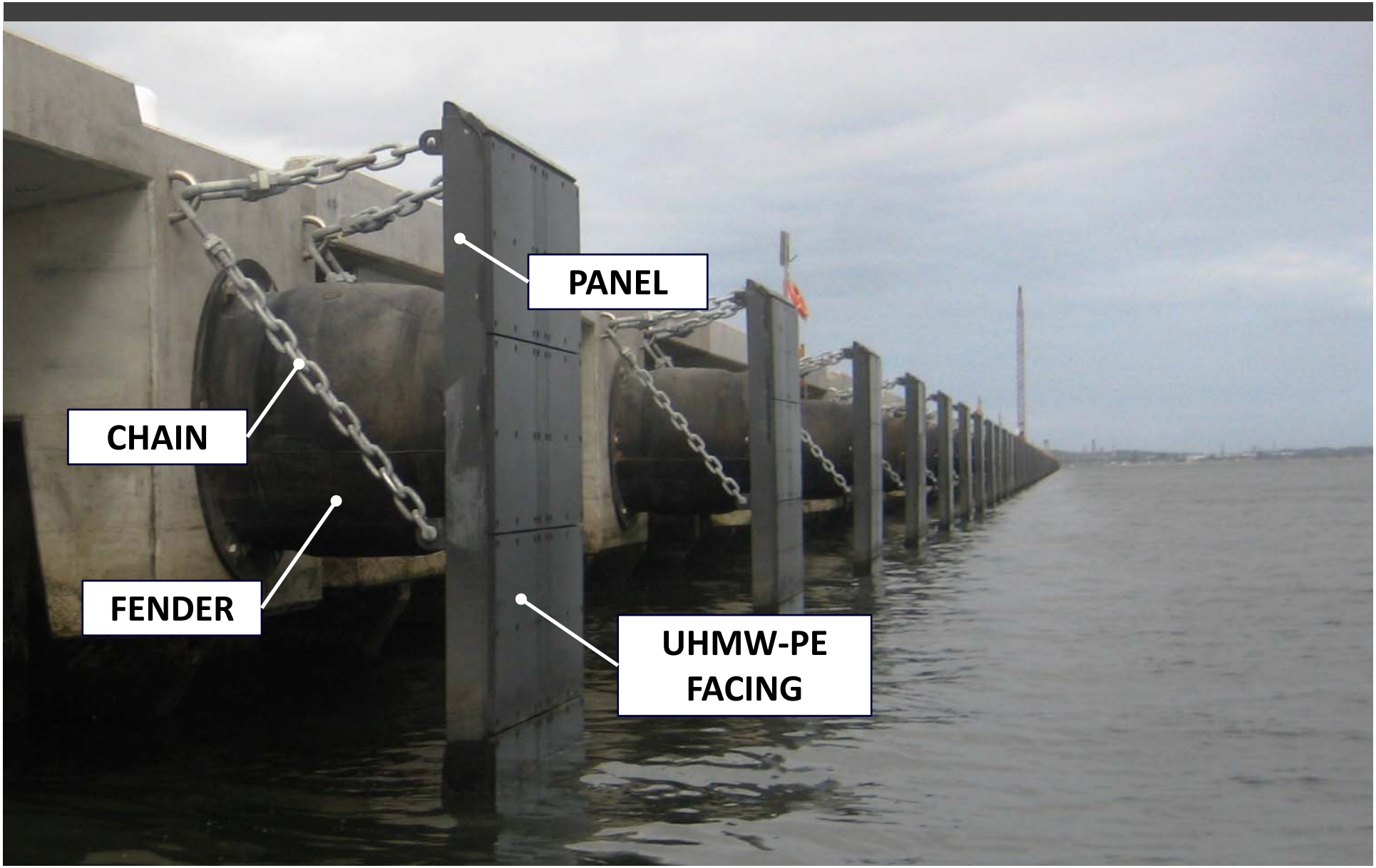

INSPECTION AND MAINTENANCE PROGRAM	Level 1	Level 2	Level 3
	close visual inspection	Interim maintenance	Major maintenance or overhaul
Rubber fenders	Every year	4–6 years	15–25 years
Steel panels (frames)	Every year	4–6 years	15–25 years
UHMW-PE face pads	Every year	4–6 years	15–25 years
Anchors & bolts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

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

Recommended Operating Spares

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

"A STITCH IN TIME SAVES NINE"

A maintenance program will:

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

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FOR COPIES OF EITHER DOCUMENTS:

REVIEW OF MARINE FENDER PERFORMANCE

or

SHIBATA INSTALLATION, OPERATION AND MAINTENANCE MANUAL

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