

Revision to PIANC WG184 – Design Principles for Dry Bulk Marine Terminals

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Summary

In March 2019, PIANC Working Group (WG) 184 released a report titled 'Design Principles for Dry Bulk Marine Terminals' as a reference to cover current technology, vessel types, and bulk handling equipment in use. During the final review process for the current WG184 document, working group members had flagged the need to keep the document updated to be consistent with documents from new working groups and to incorporate developments in materials handling. Subject to PIANC approval, it is proposed to reform the working group to update the WG184 document to keep it current, to refine the content and make it more succinct.

Keywords: terminal planning, trans-shipment, bulk handling, berthing and mooring, marine and onshore works

Introduction

Subjects proposed to be updated in the PIANC WG184 report [1] include:

- Bulk shipping fleet characteristics
- Fenders and mooring equipment
- Bulk handling systems and equipment
- Automation
- Trans-shipment
- Dry bulk shipping hazards
- Landside infrastructure
- Environmental and social concerns
- Case studies

Working Group Composition

The original WG184 working group included representatives from Australia, United Kingdom, Netherlands, Canada, Spain and Indonesia with the chair from Australia. Where possible, the original group members should be included. However, it would be desirable to invite representatives from other countries with an interest in bulk ports.

Proposed Updates and Changes

Bulk shipping fleet characteristics

The bulk shipping fleet characteristics included in the WG184 report were current to 2017. Fleet characteristics have changed since that time and this section requires updating.

Fenders and mooring equipment

Working Group WG211 is currently updating the WG33 report – Guidelines for the design of fender systems [2]. This will be particularly relevant as berthing velocities for large ships are not well covered in WG33 which was referenced in the WG184 report. WG231 for mooring bollards & hooks: selection, maintenance and testing is currently in progress. This is also relevant for dry bulk marine terminals.

Bulk handling systems and equipment

This section of the WG184 report mainly covers mineral ores and should cover processed mineral and powder products in more detail. The coverage of processing and value-added services should be reviewed and expanded. Further detail on dust and spillage control should also be added to this section due to the increased importance of environmental performance.

Automation

There have been further developments in the automation of dry bulk marine terminals since the original WG184 report was issued. For example, BHP is currently implementing fully automatic shiploading at Port Hedland and is planning to fully automate its 8 shiploaders by 2023 [3].

Trans-shipment

Transshipment is a developing area and further research into available systems should be carried out.

Dry bulk shipping hazards

Hazardous dry bulk cargoes are products that can pose a significant risk to health, environment and safety if not managed correctly. They may pose health and physical hazards to humans, pollution hazards to the environment, hazards to the safety of the ship transporting the cargo, physical hazards to the ports when loading/unloading cargo, or any combination of these. The working group needs to ensure that the standards in this area are current.

Landside infrastructure

This section requires review and updating.

Environmental and social concerns

This section requires review and updating to ensure that the recommendations are aligned with current practice.

Case studies

The original WG184 document contains case studies on the following terminals.

- FMG Herbert Elliot Port, Port Hedland
- Port Warratah Coal Services, Kooragang, Newcastle
- EBHI, Gijon, Spain
- EMO, Rotterdam, The Netherlands
- EBS Europoort, Rotterdam, The Netherlands
- EBS Laurens haven, Rotterdam, The Netherlands
- MARA Offshore Floating Terminal, Indonesia
- Gwangyang, South Jeolla Province

These case studies should be updated. Further case studies for ports handling process minerals should be included.

Conclusion

The WG184 document should be updated to ensure that it reflects current practice for the design of dry bulk marine terminals. These facilities are major investments for national and international trade and having comprehensive design guidelines assists owners, operators and engineers in meeting best practice.

References

[1] PIANC WG184. (2019). Design Principles for Dry Bulk Marine Terminals.

[2] PIANC WG33. (2002). Guidelines for the design of fender systems.

[3] Williams, A. (2nd June, 2022). BHP tests automated shiploaders at Port Hedland, Daily Cargo News (DCN).