AAPA Facilities Engineering Seminar and Expo
2015
Presented by:
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Group Product Manager, MoorMaster
Strong **VACUUM COUPLE** between ship and shore with large vacuum pads
Cavotec MoorMaster™ - Basics

- Used in the safety conscious lifting industry for many years
- Proven safe and reliable technology
Cavotec MoorMaster™ - Basics

• Steel construction
• Neoprene rubber seal
• Effective sealing area = 2.55m²
• Suction force = 20 tonnes
• 26mm lip to seal around obstructions
• Tested by DNV
Cavotec MoorMaster™ - Basics

- Surface must be relatively flat
- Seal will adapt to minor obstructions
- Vacuum accumulator
- 10-20 minutes of attachment on poor surface in case of power failure
Cavotec MoorMaster™ - Globalisation and application development

MoorMaster™ units & installations – Existing & future

28 installations by Q3 of 2015

No. of installations
No. of MoorMaster™ units


1 1 1 2 2 4 4 5 6 8 7 10 9 14 14 15 18 30 34 40
Cavotec MoorMaster™ - Successful mooring (YTD Q1, 2015)

Over 90,000 successful moorings to date

Mooring Operations – Since 1998

More than 130,000 successful moorings as per Aug 2015
Cavotec MoorMaster™ - Project references

- MoorMaster™ first entered into service in 1999 at a ferry application in New Zealand. At this point, MoorMaster™ was a bold challenge to thousands of years of conventional mooring methods.

- Today, MoorMaster™ is a widely accepted technology that has performed over 110,000 mooring operations, with a near to 100% safety record, at ferry, bulk handling, Ro-Ro, container and lock applications around the world.

- Cavotec engineers continue to develop MoorMaster™ and are perfecting new ways the technology can be used to improve safety, operational efficiency and realise infrastructure savings.
### Cavotec MoorMaster™ - MAIN BENEFITS PORT SIDE

#### EFFICIENCY & OPERATION
- Cargo and crew transfer can start earlier
- Increased cargo throughput
- Improved utilisation of tug fleet: tugs leave ships much earlier and return just prior to departure
- **Cargo operation** less dependent on weather conditions
- Vessel creep during port stay eliminated
- Aid for development of STS Automation
- Restricted waterways not disturbed
- Improved utilisation of terminal length if berthing distances reduced
- Improved service for shippers

#### TIME
- Faster vessel **turnaround** enables larger number of ship calls
- Faster connection to **shore power**, where available

#### COST SAVINGS
- **Mooring gangs** not required
- Less **wear** and tear on fenders
- Vessels longer than berths can be moored with overhang, enabling substantial savings on quay extensions or dolphin investments
- In some cases, MoorMaster™ may eliminate the need for breakwater construction

#### ENVIRONMENT
- Reduced use of the vessel’s propulsion system and of tugs and line boats diminishes fuel consumption & emissions

#### SAFETY
- Personnel safety improved
- Personal injuries during mooring reduced to a minimum
- Potential reduction in insurance premiums
- Mooring load status constantly monitored and event logs can be reviewed
Mounting on a PERMANENT QUAY example
Mounting on a PERMANENT QUAY example
Mounting on FLOATING PONTOON example
Mounting on PERMANENT QUAY example
Mounting on PERMANENT QUAY example

UTAH POINT, PORT HEDLAND, WA
Mounting on DOLPHINS example
Cavotec MoorMaster™ – Locks installations

BEAUHARNOIS CANAL LOCK 4, CANADA

3RD EDITION – SCISSOR TRUCK
Cavotec MoorMaster™ – Locks installations

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BEAUHARNOIS CANAL LOCK 4, CANADA
In 2006 Cavotec was contacted by the US Navy through the Office of Naval Research (ONR) to investigate Ship-To-Ship mooring for various vessel combinations. This research and development has resulted in an order for 6x MM200E60 units with sea trails set for Q3 2015.

While the initial trials will see a fast catamaran moored to a barge in a sea state of 3 the system has been designed with flexibility and portability in mind and has capability beyond these first vessels and sea state.

Other technologies developed during this exercise include variable vacuum to suit various hull constructions, mounting inside a ISO container for easy portability, articulated pads to enable attachment to curved hull surfaces and 3D scanning and tracking to enable attachment to a Vessel that continues to experience significant movement.
Cavotec MoorMaster™ – Ship to Ship installations

SHIP TO SHIP BY US NAVY, USA
Cavotec MoorMaster™ – Ship to Ship installations

SHIP TO SHIP BY US NAVY, USA
Cavotec MoorMaster™ – Ship to Ship installations

SHIP TO SHIP BY US NAVY, USA

MM200L60
Cavotec MoorMaster™ – Container installations

PORT OF NGQURA BY TRANSNET, SOUTH AFRICA
Cavotec MoorMaster™ – Container installations

PORT OF NGQURA BY TRANSNET, SOUTH AFRICA
Cavotec MoorMaster™ – Container installations

PORT OF SALALAH BY MSC, MAERSK & OTHERS - OMAN
Cavotec MoorMaster™ – Container installations

PORT OF SALALAH BY MSC, MAERSK & OTHERS - OMAN
Cavotec MoorMaster™ – Bulk installations

UTAH POINT BY PHPA, PORT HEDLAND
Cavotec MoorMaster™ – Bulk installations

UTAH POINT BY PHPA, PORT HEDLAND

SHIP KEPT IN PRESET DISTANCE OUTSIDE FENDER LINE
Cavotec MoorMaster™ – Bulk installations

NARVIK BY LKAB, NORWAY
Cavotec MoorMaster™ – Bulk installations

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Cavotec MoorMaster™ – Bulk installations

NARVIK BY LKAB, NORWAY
Cavotec MoorMaster™ – WHAT WE WOULD LIKE TO KNOW

Vessels
- Size
- Cargo
- New / existing
- Beltings??

Tide
- HAT & LAT
- WRT the berth height

Wind
- If information not provided we assume about 40knots. Very rare for this to be inadequate.
- Wind rose required if wind is high
- NOTE: worst case is off berth quartering

Current & Waves
- If information not provided we assume this is minimal

Berth Plans
- Enables checking of mounting options / potential service enclosure locations
- Fender details

With the above information, in most cases a budget can be provided