INNOVATIVE BALLAST WATER MANAGEMENT

Bawat's take on Ballast Water Management
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Bawat's take on Ballast Water Management by Kim Diederichsen, CEO
INTRODUCTION

Business Concept
Develop, type approve and bring to market optimal technologies for ballast water management

Ownership
• MP Investment Management A/S
• The Danish Maritime Fund
• Homarus Holding A/S
• Return ApS
• Management

Management
• Klaus Nyborg, Chairman BoD
• Kim Diederichsen, CEO
• Ole Lüthcke Christensen, CTO

Company established in 2011

Certificates
• IMO Type Approval by DNV-GL - October 2014
• IMO Type Approval by BV - May 2015
• ABS Certificate of Design Assessment – June 2015

• U.S. Coast Guard AMS - February 2015
• U.S. Cost Guard Type Approval testing ongoing
IN-LINE BWMS VS BAWAT BWMS

**IN-LINE BWMS**
Two Step Treatment Process

**BAWAT BWMS**
One step treatment process
SEAMEN’S LIFE HAS CHANGED

• Always busy while in port – cargo operation has priority and time is of essence
• Port State control and Vessel inspection by authorities
• Vessel bunker operation often conducted while in port – full attention required!
• Provision and spares are taken onboard
• Maintenance and service work conducted.
BAWAT BWMS

• Ballast water treatment is taken to sea and conducted while sailing – thus reducing risk and workload while in port.
• While sailing crew will prepare the vessel for upcoming cargo and ballast operations.
• Depending on the vessel type and trading pattern different operational treatment methods are valid.
THERE IS ALWAYS HEAT AVAILABLE

Exhaust gas

Jacket water

Scavenge air

100 % Main engine power

24%

47%

7%

18%

1%

4%

Shaft

Scavenge air

Jacket water

Lub oil cooler

Radiation

Exhaust gas
THERE IS ALWAYS HEAT AVAILABLE FOR BWMS
BAWAT PASTEURIZATION TECHNOLOGY

Regeneration section

Heating section

Retention section

67°C

72°C

40 secs
When ballast water has passed through the Bawat system ballast water can be discharged in compliance with BW discharge standards.
The Bawat BWMS can be applied in different configurations:

- ‘Circulation Treatment’ within a ballast water tank.
- From sea chest to a ballast water tank.
- From one ballast water tank to another ballast water tank.
- From a ballast water tank to overboard.
The Bawat BWMS is based on a unique technology that exploits on-board waste energy to treat ballast water in-voyage.

It is an effective and green technology based on pasteurization and it comes with marked benefits in ballast water management.

- Efficient in all water turbidities, salinities and temperatures.
- Proven standard marine components only.
Bawat BWMS is 100% scalable
The system fits most vessel segments and sizes
Main components sourced from international high-end marine suppliers
NO in-house production reducing risk during peak of BWMS retrofit period
Partner set-up in 25 Countries and more to come…
The Danish Maritime Fund

The Danish Maritime Fund was established in 2005. The Fund's objective is to offer financial support to initiatives that can serve to develop the Danish maritime industry. This is done through financial support for research, technology and product development, training, recruitment and other types of initiatives with a maritime focus.
www.dendanskemaritimefond.dk

The Market Development Fund

The aim of the Market Development Fund is to promote growth, employment and export, particularly for small and medium-sized enterprises in areas where Denmark has particular strength and potential. These areas include conversion to green technology, health and welfare solutions, design and other creative professions, etc.
www.markedsmodningsfonden.dk

The Danish Green Investment Fund

The fund is provided with up to DKK 5 billion of loan capital to invest in various projects facilitating the sustainable development of society. Environmental considerations and commercial business are two sides of the same coin.
gronfond.dk

The Danish Nature Agency

Part of the Danish Ministry of Environment, the Danish Nature Agency implements the government's policies concerning nature and environment. The Nature agency aims to secure clean water, protecting and securing nature, planning for cities and landscape, outdoor activities and information to the public about nature, forestry and land management of the state forests, gaming and wildlife management.
www.naturstyrelsen.dk
BAWAT TECHNOLOGY VALIDATED BY HARD TO ACHIEVE EU INNOVATION FUNDING

Bawat’s BWMS is being viewed as a most promising candidate to underpin Europe’s competitiveness in the global marketplace.

The EU Horizon 2020 innovation grant, worth 2.4 million EUR, will enable Bawat to meet the goal of system type approval by the USCG.

"By having qualified for support from the European Union Research and Innovation Programme (Horizon 2020) we have become part of an exclusive group of innovators. We see this as a validation of our system and of our company. The EU Commission is trusting us to become a solid player in this dawning market," Kim Diederichsen, CEO, Bawat A/S.
USCG TA: TIMELINE

Pre-tests Readiness Evaluation

- Pre-tests successfully carried out during 2017 to optimize process parameters.
- Readiness Evaluation package submitted to USCG.

Land Based Tests

- 15 ‘bioefficacy’ tests in 3 salinities.
- Test period: approx. 2 months. System operated by DHI personnel.
- Tests supervised by Lloyd’s Register.

Ship Board Tests

- Hardware installed onboard X-Press Karakoram – commissioning ongoing.
- Tests to commence Q2-2018

USCG TA Expected Q1-2019
WHAT TO DO IF EVERYTHING FAILS?

• Discharge anyway?
  • Not really an option!

• If available use port reception facility?
  • Expensive and not flexible on location

• Bawat’s Mobile BWMS?
  • Mobile, flexible and not expensive
MOBILE BWMS

Based on the innovative pasteurization technology Bawat offers a mobile containerized solution for ports, terminals and shipyards.

Treats ballast water in a one-pass operation from ship to harbor using the vessels ballast pump.
MOBILE BWMS
BAWAT BWMS INSTALLED LPG TANKER
INSTALLATION ONGOING TSH DREDGER
TURN-KEY IN-VOYAGE INSTALLATION - CONTAINER VESSEL
THANK YOU

www.bawat.com