Workshop

indicitave test of Ballast Water

2nd of June 2014

Sönke Kobarg, bbe

Ten of the Most Unwanted

Marine plants, animals and microbes are being carried around the world attached to the hulls of ships and in ships' ballast water. When discharged into new environments, they may become invaders and seriously disrupt the native ecology and economy. Introduced pathogens may cause diseases and death in humans.

Cholera

North American Comb Jelly

Cladoceran Water flea

North Pacific Seastar

Mitten Crab

Zebra muscle

Toxic Algae Red/Brown/Green Tides

Asian Kelb

Round Goby

European Green Crab

Further information:
Global Ballast Water Management Programme
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www.globallast.imo.org

Photo credits: *Ship Discharging Ballast Water* – CRIMP, CSIRO Marine Research, Australia, *Zebra Mussel* – Sergei Olenin, *Cladoceran Water Flea* – Mirja Rosenberg, *Cholera* – Gloria Castle, *Comb Jelly* – Richard Harbison, *Asian Kelp & North Pacific Seastar* – CSIRO Australia, *European Green Crab* – T. Hutpani, *Toxic Algae* – D.R. Hoffman, *Mitten Crab* – Stephan Gollasch, *Round Goby* – David Jude

Concept, content and design: Steve Raaymakers and Liz Gould (designatlizgould.plus.com)

The species presented here are for illustrative purposes only. Their introduced ranges may be greater than depicted. There are numerous other examples of serious marine bio-invasions around the world.

Global Ballast Water Management Programme

GEF

undp

IMO

WANTED: Chinese Mitten Crab (aka: *Eriocheir sinensis*)

Crime

Known to burrow into riverbanks, presenting a hazard to river and other freshwater engineering projects. Out-competes many native species. The crab is capable of emerging from water and crossing dry land to enter new river systems.

Kiel-Canal
New home of the Chinese Mitten Crab

International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

Date of adoption 13 February 2004, London
Status **Not yet in force**

Condition for entry into force
12 months after the date on which not less than **30 States**, the combined merchant fleets of which constitute not less than **35% of the gross tonnage** of the world merchant shipping have deposited the requisite instrument of ratification, acceptance, approval or accession

Status of Ratification of the IMO BWM Convention (May 2014)

Country	% Tonnage	Parties to the Convention:
Needed: 30	Needed: 35%	Albania, Antigua and Barbuda, Barbados, Brazil, Canada, Cook Islands, Croatia, Denmark, Egypt, France, Germany, Iran, Kenya, Kiribati, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mexico, Mongolia, Montenegro, Netherlands, Nigeria, Niue, Norway, Palau, Republic of Korea, Russian Federation, Saint Kitts and Nevis, Sierra Leone, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, **Tonga**, Trinidad & Tobago, Tuvalu
Current: 39	Current: 30.38%	

Ballast Water performance standard (D-2)		
organisms	50 µm ~	less than 10 viable organisms/m3
	10 ~ 50 µm	less than 10 viable organisms/ ml
microbes	Toxicogenic Vibrio cholerae	less than 1 cfu / 100 ml or less than 1cfu / 1 gram (wet) zooplankton samples
	Escherichia coli	less than 250 cfu / 100 ml
	Intestinal Enterococci	less than 100 cfu / 100 ml

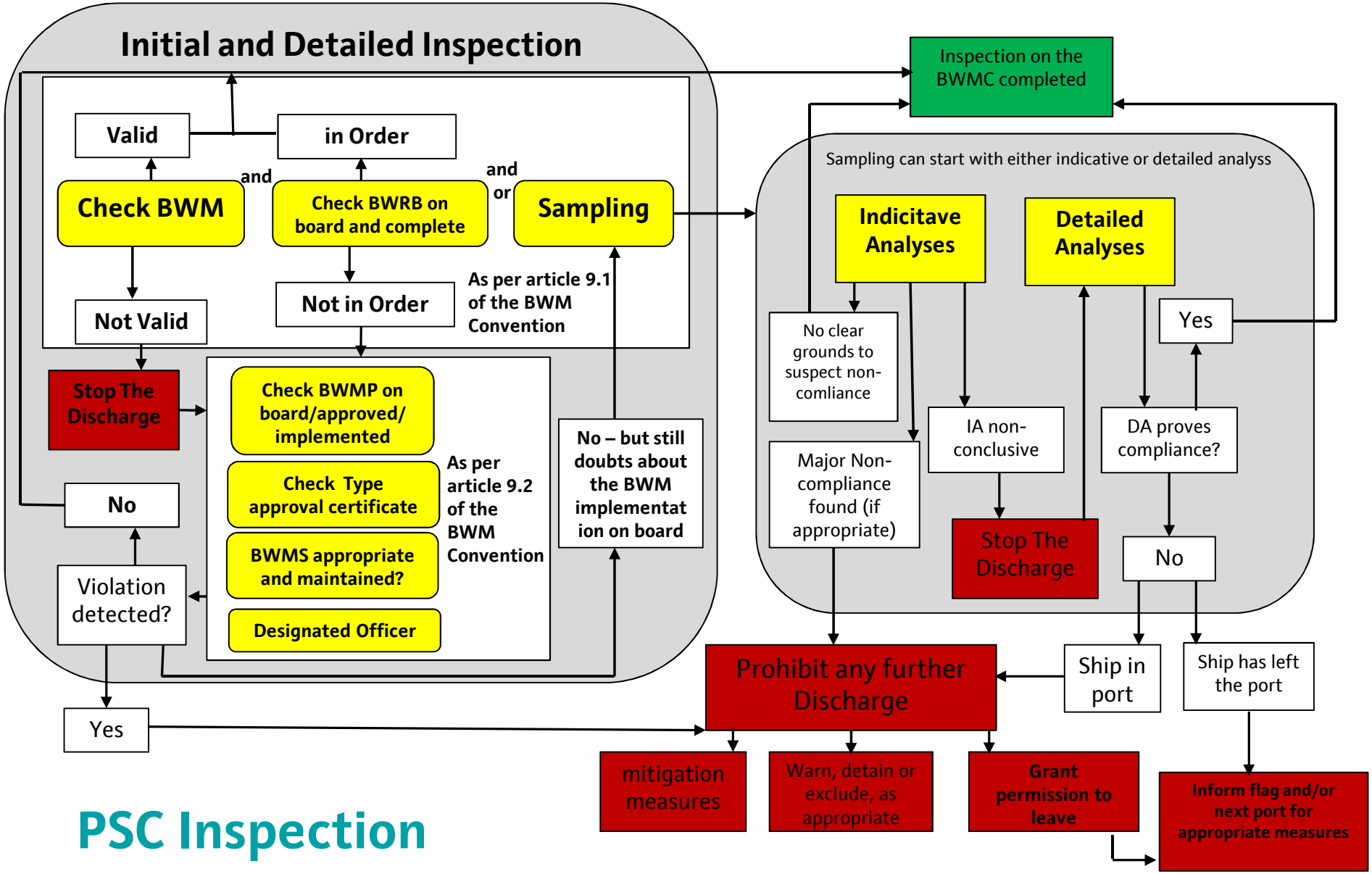
cfu : colony forming unit

Article 9 of BWM Convention

1 A ship to which this Convention applies may, in any port or offshore terminal of another Party, be subject to inspection by officers duly authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention. Except as provided in paragraph 2 of this Article, any such inspection is limited to:
(a) verifying that there is onboard a valid Certificate, which, if valid shall be accepted; and
(b) inspection of the Ballast Water record book, **and/or**
(c) a sampling of the ship's Ballast Water, carried out in accordance with the guidelines to be developed by the Organization. However, the time required to analyse the samples shall not be used as a basis for unduly delaying the operation, movement or departure of the ship.

Enforcement Regime Port State Control

Initial inspection
Documentation
IBWM Certificate
BWMP / Approved by Administration
Type test certificate / appropriate environment
Ballast Water Record Book
D-1 Sampling / Salinity
D-2 Analyses / **Indicative**
D-2 Analyses / Detailed



PSC Inspection Flow chart

Indicative analysis: means a compliance test that is a relatively quick indirect or direct measurement of a representative sample of the ballast water volume of interest.

Detailed analysis: means a compliance test that is likely to be more complex than indicative analysis and is a direct measurement of a representative sample used to determine the viable organism concentration of a ballast water volume of interest.

What is the truth?

		Indicative test method	
		OK	Not OK
Reality	OK	True negative	False Positive
	Not OK	False Negative	True Positive

What is the acceptable truth?

		Indicative test method	
		OK	
Reality	OK	Drink! Live!	Don´t drink! Pay money!
		Drink! Die!	Don´t drink! Don´t die!

can be accepted to some degree

Zero tolerance for false negative

Requirements for indicative test methods

- Fast
- Reliable
- Portable
- Easy to handle
- Able to distinguish between dead or alive
- Very low detection limit (close to „0“) because all indicitave test methods have high variability

Available indicative test methods

- Microscope
- ATP
- FDA
- PAM
- „modified PAM“
- ...

Candidates – no international standards yet.

Future and reality will choose the right method.