

# Onboard Ballast Water Sampling for Compliance Control



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# Content

- Overview of sampling studies
- Comparison of sampling method performance, i.e. sequence vs. entire time
- Sampling for compliance control (IMO sampling requirements)
- Recommendations/Summary



# Sampling Experience

- Sampled more than 250 vessels during several ballast water sampling studies
- En-route daily sampling studies
- Sampling method comparison
- Undertook more than 40 sea voyages to check performance of ballast water treatment systems
- Recent study on sample representativeness with Matej David

EMSA Ballast Water Sampling Workshop, Lisbon, February 2010



# Sampling Purpose

- Academic interest
- Awareness raising
- Risk assessment
- Performance tests of ballast water treatment systems
- Compliance control with ballast water management requirements





# IMO BWM Convention

- Regulation D-2 of the BWM Convention stipulates that ships meeting the requirements of the Convention must discharge:
  - less than 10 viable organisms per cubic meter greater than or equal to 50 micrometers in minimum dimension, and
  - less than 10 viable organisms per millilitre less than 50 micrometers in minimum dimension and greater than or equal to 10 micrometers in minimum dimension, and
  - indicator microbes, as a human health standard.

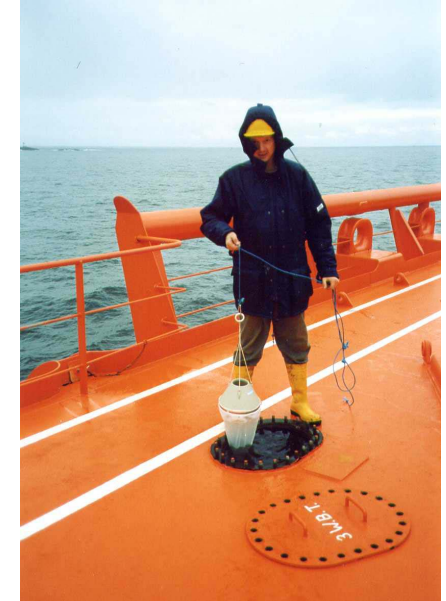
# IMO Sampling Guideline

- Guidance for compliance control sampling
- Still unresolved:
  - sampling access point (discharge line vs. in-tank sampling)
  - sample volumes
  - number of replicates (3 required???)
- IMO works on sampling guidance document



# Sampling Access Points

- Sounding, air pipes
- Fire-fighting system
- Manholes
- Ship's ballast water pipe
- Cargo holds





# Sampling at discharge vs in-tank

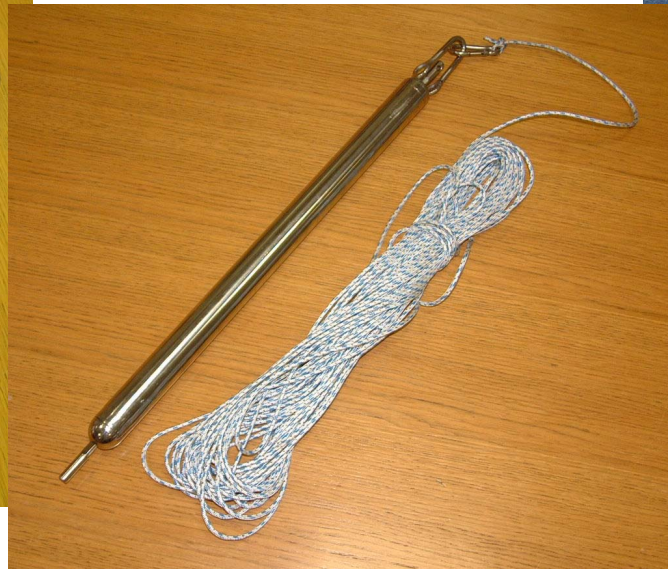
- As per the Convention discharge sampling seems most logical (ships shall discharge < D-2)
- Issues with this
  - no in-line sampling points
  - tanks emptied by gravity
  - high risk vessels should not discharge water in port (unwanted species would be discharged during in-line sampling)
- Consider in-tank sampling





# New Devices for In-tank Sampling

- Designed for the purpose of ballast water sampling during Slovenian sampling study



# Advantages

- “Unlimited” pumping head
- Independent from ships ballast water operations
- Method to be used via manholes or sounding pipes
- Sounding should be easily accessible





# New Device for In-line Sampling

- New sampling device for the concentration of organisms  $>50\ \mu\text{m}$
- Device collects water and concentrates organisms simultaneously
- Flow-meter indicates the volume of water sampled
- In less than 30 minutes up to 2.5 cubic meters of water were sampled





# Advantages

- Includes flow-meter
- Collects and filters water at the same time
- Easy to carry
- Replaceable cod-end with replacement filter sieve
- During longer sampling times open cod-end tap to extract organisms every 10 minutes to ensure optimum survival

