



KITTIWAKE

monitoring innovation

Potable Water Quality

Established Legislation Framework

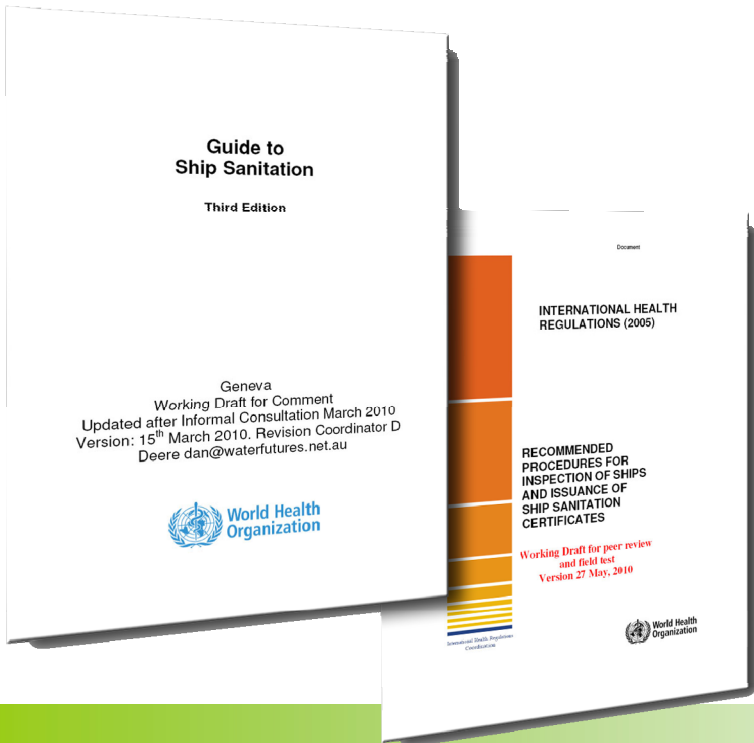
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Legislation Framework

International regulations regarding the Potable Water Quality Monitoring and Control were driven by the World Health Organization (WHO) via its International Health Regulations (IHR).

Soon enough adapted for on-board potable water, as part of the overall Ship Sanitation guidance of WHO.

Monitoring and control compliance procedures are laid out in the WHO guidance for Ship Sanitation Certificates (SSC).



A number of international regulatory bodies cascade their guidance adopting the fundamental principles defined by WHO.

Thus among others, ILO, MCA through MGN's, HPA, etc. are outlining the imperatives on monitoring and control of Potable Water quality on ship, with strong reference to WHO detailed guidance on Ship Sanitation.

The overall framework is regularly revised with new revisions and more detailed guidance, becoming more and more specific and strict.

Ship Sanitation Guidance



The **World Health Organization** on the reference book titled “**Guide to Ship Sanitation**”, defines in detail the testing requirements and obligations of the operator, in regards to **Potable Water**.

Part I: Mandatory monitoring and verification activities *(excerpt from pg.27)*

By far the greatest risks in drinking-water are associated with microbial contamination from human excreta sources.

Monitoring source water at the port is carried out to ensure water is safe.

Recommended parameters to be monitored include:

- **escherichia coli (E. coli) or thermotolerant (faecal) coliforms,**
- **disinfectant residual,**
- **corrosion-related contaminants,**
- **turbidity,**
- **heterotrophic plate count (HPC) and**
- **aesthetic parameters**

E. coli or thermotolerant (faecal) coliforms are utilized as the indicators of potential contamination from pathogens associated with human excreta. Total coliforms are not necessarily indicators of faecal contamination, but may reflect a lack of general cleanliness.

E. coli and thermotolerant (faecal) coliforms should be measured using generally accepted analytical techniques.

HPC should be measured to provide an overview of the general status of microbial life in the system.

Monitoring and verification activities



Part II: Roles and Responsibilities of the Ship Operator *(excerpt from pg.28)*

The ship operator's role is to provide a safe water supply to passengers and crew fit for all intended purposes.

Water on board should be kept clean and free of pathogenic organisms and harmful chemicals.

Responsibilities are:

- to **monitor** the water system, particularly for microbial and chemical indicators
- to **share** sampling **results** with stakeholders
- to **report** adverse results to the competent authority where required
- to **take corrective actions**

Adverse results should also be communicated to the crew and passengers when and where necessary.

Where there are methods or materials advised by WHO for particular tests, then these should be applied

IMPORTANT:

The term “**Fresh Water**” used in ILO Conventions and MLC should be interpreted as “**Potable Water**”

Marine Guidance Note 397



MCA's **Marine Guidance Note 397**, outlines the legal framework, introducing a discrete section specifically for Fresh Water (*Part 2, pg.12*).

Article 3 on “**Disinfection**” states:

- 3.1 Chlorine should be present above 0.2mg/l
- 3.2 Silver dose levels; it is the testing that will confirm proper dosing maintained
- 3.4 UV should not be relied upon as the only means of sterilization
- 3.5 Temperature monitoring is required to ensure effective thermal disinfection of hot water system; i.e. using thermometer with immersion and surface contact probe

Article 4 on “**Water Making Plant**” states:

- 4.0 Water making by distillation system should also dose chlorine as a biocide

Legislation reflection to Kittiwake Test Kits

Kittiwake's Marine Potable **Chlorine** Test Kit:

- Contains all chlorine testing requirements associated with each part of the ship (i.e. tanks and water outlets)
- Quantifies the chlorine levels at fresh water tanks and outlets.
 - Should be sampled and measured at least daily (according to UK Health Protection Agency Guidance - 3-4 times a day)
 - Also, whenever water is bunkered
 - Tank chlorine levels should be increased between 1 and 5ppm to ensure 0.2ppm at all outlets
- Quantifies the high chlorine levels at superchlorination events
 - Superchlorination of the system is required every 6 months.

Kittiwake's Marine Potable **Bacteria** Test Kit:

- Contains simple methods of determining:
 - Coliforms and e.coli (WHO guideline levels are zero CFU per 100ml)
 - Coliform/e.coli testing should be done each time water is bunkered to ensure quality and prove no contamination has occurred
 - Heterotrophic plate count to recommended levels
 - 0-100 CFU/ml ideal
 - 100-1000 CFU/ml acceptable
 - 1000+ requires immediate superchlorination
 - Note: Heterotrophic Plate count is an excellent test for ensuring pipework integrity. Frequent testing of different outlets across the water network will show any "spike" high results that would indicate localized contamination of the system. This is likely to come from the inability of superchlorine levels to sterilize scaled pipes - thus allowing bacteria to proliferate to potentially harmful levels. A high HPC test together with the absence of any chlorine at a particular outlet should instigate examination/descale/replacement of that pipework section. Testing HPC immediately after filter units will also show if the unit has become infected.



Kittiwake's **Silver Ion** Test Kit:

- Kittiwake's silver ion test kit will measure free ionic silver only - not precipitated silver.
- It is the appropriate kit for onboard testing, as it is just ionic silver that is biocidal.
- WARNING: Laboratory tests will provide a total silver result, which may explain why systems treated with silver ionization often host high bacteria levels. The operator falsely believes the system contains the correct ionic silver levels when it does not.

Bibliography

Document Title	Published by	on
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2. Guide to Ship Sanitation	WHO	Mar-2010
3. Marine Guidance Note No.397	MCA	Jul-2009
4. Implementation of Ship Sanitation Control Certificate	WHO	Jun-2006
5. ILO Convention No.178	ILO	Oct-1996
6. Guidelines for Drinking Water Quality	WHO	Jan-1997
7. Marine Guidance Note No.061	MCA	Feb-1998
8. World Health Assembly No.58 - Health Regulations	WHO	May-2005
9. Ship Sanitation Control Certificate	US Navy	Jan-2010
10. Vessels Requiring Ship Inspection Certificates	APHA	Feb-2010



All documents available in our [on-line](#) library

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