What you can do to improve drinking water safety

The drinking water supply system and its elements
• Avoid standing water in seldom-used areas, such as the medical station or unused cabins – implement a flushing regime.
• Strictly comply with the maintenance instructions applicable to the elements of the drinking water supply system (e.g. hydrophore system, water hardener, water heater, UV light disinfection device and chlorine dosing system).
• Clean the UV light disinfection devices at regular intervals. From time to time you should replace the bulbs in accordance with the manufacturer’s instructions.
• If applicable, hire an expert firm to service your drinking water supply system.

Bunkering drinking water
• Only use suitable, approved drinking water hoses with sealing caps to store potable water.
• Ask the water supplier for a water quality report before you bunker potable water.
• Store all water treatment equipment (hoses, fittings, fixtures, disinfection agents) at least 45cm [17.7in] above the ground.

Cleaning and disinfection
• Clean and disinfect all aerators, showerheads and hoses regularly to reduce the risk of bacterial/biofilm growth and other types of contamination.
• Use heated water to flush all fittings, fixtures and showerheads (one after the other, at 70°C for at least 3 minutes) at regular intervals to kill Legionella bacteria.

Temperatures
• Set the water heater to the correct temperature (flow pipe > 60°C, return pipe > 55°C) to prevent Legionella bacteria from growing in the system.
• Ideally, the temperature of the whole cold-water system should be < 20°C; at no time should it be > 25°C! (Insulation present!)
Water Systems are “living” Systems

Water is the habitat of a wide range of microorganisms and is particularly vulnerable to contamination. However, only some bacteria in potable water are known to be pathogenic to humans and/or may cause health problems after ingesting them.

The water supply system is a “living” system. If you touch the inside of a water tank after a few weeks, you will feel a slimy surface - the so-called biofilm - that consists of a range of different bacteria. That kind of biofilm, which you will also find in your potable water system, is considered normal.

Colony-forming units (CFU)

- If CFU are detected, the water supply system may be microbially contaminated from the treatment station all the way to the potable water installation.
- An increased colony count does not indicate the presence of specific pathogens.
- Possible causes may be: inferior treatment, pipe bursts, biofilm formation all the way to standing water in the pipe system.

Coliform bacteria

- The term comprises faecal coliforms as well as “environmental” coliforms (naturally present in the environment).
- The presence of coliforms does not necessarily indicate faecal contamination however, it does point to a potential contamination problem in the potable water system.
- For instance, coliforms may multiply if the materials used in the water supply distribution system are unsuitable, water temperatures are > 20°C and/or in anaerobic conditions.

Escherichia coli (E. coli)

- Present in the intestinal flora of humans and animals
- The presence of E. coli indicates that the water is contaminated with excreta (most likely recently), which means that other faecal pathogens may be present too.
- Drinking the water may, in certain cases, cause serious illnesses (e.g. diarrhoea).

Pseudomonas aeruginosa

- P. aeruginosa has a remarkable ability to form biofilms; it usually grows at temperatures of between 4°C and 42°C.
- Drinking water contaminated with the bacterium can contaminate other (water-carrying) areas, e.g. medical devices, showers, whirlpools, etc.
- A significant increase in P. aeruginosa can be an indication of stagnation problems in the potable water installation.
- It can cause a number of infections, e.g. in open acute and chronic wounds, burns or contact lens care.

Enterococci

- Present in the intestinal flora of humans and animals
- The presence of enterococci indicates that the water is contaminated with excreta, and it is likely that other faecal pathogens are present too.
- If only enterococci are found, the contamination is likely to have happened some time ago.

Microbiological Laboratory Parameters to determine the Quality of Potable Water

Get qualified professionals to do the sampling

Drinking water samples must be collected by experts who have the equipment needed for the task. Make sure that only qualified professionals trained at a laboratory certified to ISO 17025 take the samples. The best approach would be to install taps specifically designated as sampling taps at various locations in the potable water system, in particular at each drinking water tank. Sampling taps must be clean and should bear an identification number. They are preferably made of metal without rubber sealing, fitted with an aerator and labelled “for drinking water sampling only”.

Check your drinking water regularly!

Every time the potable water quality is tested, the results will only indicate the water quality as measured on that day. Contamination may change the level of quality within just a few days. You should therefore monitor the drinking water supply system and regularly test the water quality. To ensure early identification of contamination within your potable water system, we recommend you hire qualified professionals who test the quality of your drinking water at least once a year.

More information on drinking water management and drinking water quality on ships is available on the WHO website at:
http://www.who.int/water_sanitation_health/publications/en/