MLN 3.2

Revision No 0

DEPARTMENT OF ECONOMIC DEVELOPMENT

MLC Title 3.2 Food and Catering

This MLN provides guidance on compliance with Isle of Man (IOM) regulations which give effect to MLC 2006 Title 3.2. Implementation of these guidelines will be taken as evidence of compliance with the Isle of Man regulations.

The guidelines do not preclude the shipowner from demonstrating an equivalent or higher standard as an "alternative method" of evidence of compliance.

Documents referred to in this notice:

The Maritime Labour Convention 2006;

Certification of Ships' Cooks Convention 1946 (No.69);

Isle of Man Merchant Shipping (Crew Accommodation) Regulations 1978;

Recommendations on the Safe Use of Pesticides in Ships;

The Code of Safe Working Practices for Merchant Seamen;

ISO 15748-1: 2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 1: Planning and design;

ISO 15748-2: 2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 2: Method of calculation;

World Health Organisation - Guide to ship sanitation (third edition); and

HSE Approved Code of Practice and Guidance for the Control of Legionella Bacteria in Water Systems.

Most regulations and notices are available on the Isle of Man Government website: www.iomshipregistry.com or by contacting marine.survey@gov.im

Key Points

- All shipowners should provide free of charge food and drinking water of appropriate quality, nutritional value and quantity to meet the needs of those on board.

- Food hygiene principles and the provision and maintenance of fresh water must be applied regardless of the age, size and type of vessel.
- Bacterial contamination is the most serious risk to food and fresh water safety.
- Those preparing or serving food must be properly trained and demonstrate a working knowledge of the principles and practices of food hygiene.
- Prevention using a risk assessment and management approach is one of the most effective means of ensuring food and fresh water safety.
- The Isle of Man requires that "The Code of Safe Working Practices for Merchant Seamen" is carried on board ships registered in the Isle of Man. Detailed advice specific to galley operations is available in Chapter 14.
- The Maritime Labour Convention 2006 also covers standards for Food and Catering for ships to which the convention applies (Title 3.2 of the Convention) and this Maritime Labour Notice reflects that provision.

Guidelines for Compliance – Food and Catering

Part 1: Cook and catering staff qualifications.

Part 2: Food safety and hygiene including guidance on diet and nutrition.

Part 3: Water, including its supply, storage and distribution and directions on maintenance of water systems.

Part 1: Cook and catering staff qualifications

1. Cook and catering staff qualifications

Evidence of Compliance

1. The shipowner is responsible for making sure that no seafarer under the age of 18 is employed or engaged or works as a ship's cook.
2. It is the shipowner's responsibility to make sure that MLC ships operating with a prescribed manning of 6 or more seafarers, on voyages of more than 3 days or more than 36 hours from a safe port, carry a fully qualified cook.
3. A ship's cook should have evidence of qualifications as a ship's cook, such as:-
    1. National Vocational Qualification (NVQ) Level II in catering and hospitality; or
    2. certificates of qualification as a ship's cook issued by countries that have ratified the Maritime Labour Convention 2006; or
    3. certificates of qualification as a ship's cook issued by countries that have ratified the Certification of Ships Cooks Convention, 1946 (No.69); or

4. confirmation that they have been serving as a chef in a professional kitchen, commercial yacht or passenger ship and evidence that they have completed training in food and personal hygiene, food storage, stock control, and environmental protection and catering health and safety; or

5. confirmation that they have served as a ship's cook before the Maritime Labour Convention 2006 has been ratified by the Isle of Man and evidence that they have completed training in food and personal hygiene, food storage, stock control, and environmental protection and catering health and safety;

4. Where an MLC ship has a prescribed manning of less than 6 seafarers and a trading pattern where voyages are not more than 3 days or not more than 36 hours from a safe port then a fully qualified cook is not required. In such cases the training or instruction provided for all catering staff involved in the processing of food is required. *(paragraph 5 below)*

5. All catering staff involved in the processing of food should be properly trained and instructed for their position and have evidence of completion of a training course or of being instructed in food and personal hygiene and handling and storage of food. This should be available at the initial MLC inspection.

6. The Isle of Man Ship Registry can issue a dispensation in exceptional circumstances for a non-fully qualified cook to serve on a specific ship. The dispensation would only be valid for a specified limited period and for not more than one month from the date of issue.

Part 2: Food safety and hygiene including guidance on diet and nutrition

This Part covers construction, design, equipment and maintenance of galley areas, health and safety, diet and nutrition, food and personal hygiene, preparation, cooking and food service, storage and cleaning.

2. Design, construction, equipment and maintenance of galley areas

Evidence of compliance

1. Food areas should be designed, constructed, equipped and properly maintained to enable good hygiene and suitable health and safety standards. Materials used for decks, bulkheads, deckheads and doors should be durable, non-absorbent, smooth and easy to clean with no sharp edges or corners.

2. Work surfaces should be constructed from a suitable material such as stainless steel. Other durable, non-absorbent, smooth materials may be used as long as they can also be maintained in a good condition and are easy to clean and disinfect.

3. Decks should be anti-slip and be provided with gutters and scuppers to ensure effective drainage where necessary. Scuppers when used should be fitted with drain traps.

4. The design and layout should enable clear access below, behind or between equipment, or it should be properly sealed/integrated to prevent the accumulation of debris in inaccessible spaces. So far as practical, refrigeration units should not be located close to ovens or other large galley cooking units. There should be adequate working space to provide a safe working environment.

5. The ventilation system in the galley should be independent from other ventilation systems on board the ship and arranged to ensure an adequate supply of fresh air and the efficient discharge of fumes. The system should include a supply fan and an exhaust fan to draw off fumes from cooking appliances and discharge them into the open air.

6. The ventilation system should be adequate to maintain reasonable temperatures and humidity levels. Condensation particularly on deck heads can be a problem but with suitable mechanical ventilation this can be kept under control. Supplementary ventilation should be provided for particular hot spots. Ventilation ducting should be accessible and regularly cleaned to minimise the risk of fire.

7. An intervening air space should be provided between any WC and the galley/food preparation rooms.

8. Equipment should be adequate for the number of crew and fit for purpose. Equipment and utensils shall be fixed in place or stored safely to avoid damage or injury when the ship rolls. Equipment should be stored so as to protect it against contamination.

9. Dedicated hand wash basins with provision for soap and towels should be provided for the use of the catering staff. In addition dedicated sinks for food preparation and equipment washing should also be provided.

3. Health and Safety Issues

Evidence of compliance

1. The galley and store area working environment contains many obvious and potential hazards such as extreme surface and ambient temperatures, humidity, cleaning substances, electrical equipment, fumes and knives. Equipment such as deep fat fryers, are also potentially hazardous. Practical control measures should be in place to reduce the risk of injury in the catering environment, which should include:

    1. Anyone working in the catering areas should be provided with appropriate protective clothing and specialist anti-slip, protected toe cap footwear.
    2. Knives and other sharp utensils should not be left in a sink or washing-up bowl submerged in water.
    3. Stowage - items should be properly secured:
        i. Pots and pans should be secured during cooking and only filled to safe levels particularly in heavy seas.
        ii. Protective guards shall be fitted on mechanical fans, food mixers and other kitchen equipment with exposed blades or other dangerous parts.
        iii. Electrical equipment, including wiring in the galley and store areas should be regularly inspected by either a qualified member of the crew or a shore side contractor.
    4. Burns and scalds are common injuries. A first-aid box should be provided either in the galley or a suitable area convenient to the galley. The contents of the first-aid box should be checked and when necessary replenished at appropriate intervals. A notice stating the action to take if someone is burned or scalded should be prominently displayed in or close by the galley.

5. The use of anti-bacterial hand cleaners, moisturising cream and barrier creams should be encouraged to reduce the risk of skin infections, particularly dermatitis.

6. Detailed advice specific to galley operations is available in Chapter 14 of the Code of Safety Working Practices for Merchant Seamen.

4. Diet and Nutrition

Evidence of compliance

1. Shipowners are responsible for providing food and drinking water of appropriate quality, nutritional value and quantity that adequately covers the ship's requirements.

2. Shipowners are also responsible for providing seafarers with food and water free of charge during their period of engagement on board the ship.

3. A good variety of food provides a healthy diet. Meals should provide a balance of carbohydrates, protein, fat and fibre, vitamins and minerals. Food should be prepared and cooked with minimum levels of salt, fat and sugar. As a general guide:
    1. High energy food (carbohydrates) includes bread, potatoes, rice pasta, and breakfast cereals.
    2. High protein food includes fish, meat, poultry, eggs, milk and other dairy products (check the fat content of some cheeses).
    3. Vitamins and minerals are contained in fruit and vegetables, fresh, frozen, dried and canned, including fruit juice.
    4. Drinks – as with food a balanced intake is important. Not too much sugar, caffeine and calories. Water, fruit juices and low fat milk are all good alternatives.
    5. Provision should be made for any special needs because of religion, special dietary requirements, or customary dietary practices where certain rules or requirements in relation to some food or with the way the food is prepared must be observed.
    6. Catering staff should be aware of the dangers associated with food allergies. If a person with a food allergy inadvertently eats even a small amount of that food this can make them very ill or in extreme cases cause death. Some problem ingredients are peanuts, nuts, gluten, fish, soya, celery, mustard, sesame seeds and sulphur dioxide.

5. Food Hygiene

1. Hazard Analysis and Critical Control Point (HACCP) system

1. In the case of companies operating large passenger/cruise ships and other vessels with a substantial crew complement, the philosophy of the International Safety Management Code is likely to have been extended already to include food and fresh water safety and hygiene issues, based on a Hazard Analysis and Critical Control Point (HACCP) system. A HACCP system is a structured and documented hazard analysis system, identifying critical control points and specific actions to be taken at those points. HACCP is required under food safety legislation, and is applicable to food businesses. Such systems are based on a robust food safety policy and detailed procedures, all fully documented that will extend far beyond the primary advice contained in this MLN.

Evidence of Compliance

2. Food hygiene practice

1. Traditionally the basis for food hygiene standards has been the use of clean, well maintained catering spaces and the avoidance of unsanitary conditions. Even in clean, well-maintained galleys however, care must be taken not to handle food carelessly with insufficient regard to food safety. Good food hygiene is more than cleanliness; it requires food to be protected from the risk of harmful contamination by bacteria, chemicals and other foreign bodies from point of delivery to point of consumption. Bacterial contamination is the most serious risk to food safety and causes the majority of food poisoning cases but physical and chemical contamination may also occur accidentally, for example, from loose buttons, jewellery, other foreign bodies or from cleaning agents.

2. Good food hygiene requires the sourcing of safe food. In certain circumstances unsafe food will always remain unsafe regardless of the measures taken.

3. Examples of causes of food poisoning

1. Preparation of food too far in advance and stored at room temperature;
2. Cooling food too slowly prior to refrigeration;
3. Not reheating food to high enough temperatures to destroy harmful bacteria;
4. Using contaminated cooked food;
5. Undercooking;
6. Not thawing frozen meat for sufficient time;
7. Cross contamination from raw food to cooked food;
8. Storing hot food below 63°C;
9. Infected food handlers; and
10. Improper use of leftovers.

4. Bacteria

1. No catering environment operates without harmful bacteria being present at some time, and plenty of food is produced in environments where microbiological environmental levels are very low. A good HACCP system will prevent illness in these circumstances. Small numbers of certain bacteria such as Salmonellae can cause serious illness. Most pathogenic bacteria are destroyed by adequate cooking but harmful preformed bacterial toxin, mycotoxins and algal toxins are unaffected by heat. Pathogenic bacteria also thrive in cool, dry and anaerobic conditions. Raw meat is considered to be high risk because of the likely presence of E.Coli, Salmonellae, L. monocytogenes. Depending on the source viable cysts of intestinal parasites may also exist. Good practice before cooking or processing should prevent bacteria multiplying to the extent that would cause illness or food spoilage.

2. Bacteria levels rise rapidly in a warm moist environment on certain foods that support their growth, such as high protein foods. However foods with high levels of sugar, salt or other preservatives do not provide favourable growth conditions.

3. "High risk" foods, those most commonly implicated in food poisoning cases, are considered to be food that supports bacterial growth and is ready to eat without further cooking. For example:

   i. cooked meat, poultry and rice;

   ii. meat products such as gravy and stock;

   iii. milk, cream, eggs, and egg products; and

   iv. shellfish and other seafood.

4. Raw meat although a source of bacteria is not considered to be "high risk" because it is generally cooked before consumption.

5. People often harbour some types of harmful bacteria at some point - hands are particularly susceptible.

6. This MLN also provides guidance on other common sources of harmful bacteria such as insects, flies, rodents etc, dust and waste food an.

5. Bacterial Food Contamination

1. Contaminated food looks, tastes and smells completely normal unless it is so contaminated spoilage occurs. Bacteria levels in high risk food and raw meat will rise rapidly in warm conditions. Contamination usually occurs through recklessness, ignorance and people taking short cuts, and handling or storing food carelessly.

2. Bacteria can pass directly from the source to high risk food, for example raw meat can contaminate cooked meat where human, animal or insect intervention occurs. Cross contamination, where bacteria are transferred by some other means is a constant threat to food safety. The main "vehicles" are hands, hand and food contact surfaces, cloths and equipment. Other "vehicles" include water, other foods and insects.

6. Prevention of bacterial food poisoning

1. Food must be protected against contamination. High standards of personal cleanliness and food safety must be observed. Any existing bacteria already in the food must be prevented from growing to dangerous levels. Most bacteria can be destroyed by thorough cooking but not pre-formed toxins. To reduce the risk of food poisoning a range of control measures should be put in place covering:

   i. Personal hygiene;

   ii. Temperature control (keep food hot >63°C or cold <5°C);

   iii. Segregation of raw and cooked foods;

   iv. Ensuring no risk of cross contamination via hands, cloths etc;

   v. Thorough cooking;

vi. Adequate and proper cleaning; and

vii. Purchasing safe supplies and ensuring safe delivery.

7. Cross contamination with food allergens

1. It is important for catering staff to be aware of the risk of allergen cross contamination in situations where a seafarer has asked for food to be free of a certain ingredient to which they are allergic or intolerant. A number of steps can be taken to reduce the risk, including preparing the food from scratch, keeping surfaces clear of the allergen of concern, using separate utensils to prepare and serve the allergen free food, avoiding transference of crumbs or seeds from other foods and by using correctly labelled airtight containers.

8. Personal Hygiene

1. It is essential for food handlers to strictly observe and practice high standards of personal cleanliness. They should be clean and tidy and wear suitable light coloured protective clothing.

2. There must be adequate hand wash basins with soap and hand drying facilities available to the catering staff. Disposable towels or a hot air dryer are better than a traditional towel. Food handlers must wash their hands regularly and always on entering the galley, before handling any food or equipment, after smoking and/or touching hair, nose, mouth, dirty clothing etc. Hands must also be washed after visiting the WC, and in between handling raw and cooked food.

3. Toilets with hand wash basins should be situated near to, but separate from, the galley. Prominent signs about washing hands should be displayed.

4. Food handlers should avoid so far as possible direct contact between hands and food, by using tongs for example. Appropriate protective gloves may be worn but they can give a false sense of security.

5. Cuts, spots, sores, etc should be completely covered by coloured waterproof dressings.

9. Fitness to work

1. Anyone working with food with food poisoning symptoms, for example diarrhoea and vomiting, or suspected of carrying food poisoning organisms because of close contact with a confirmed case should be immediately excluded from any job which might expose food/water to the risk of contamination. If a food handler has suffered sickness and diarrhoea they should not handle food for at least 48 hours after the symptoms have ceased. Several other conditions require infected persons to be similarly excluded for varying lengths of time according to medical advice. Secondary infections associated with boils and septic cuts, respiratory infections from heavy colds may also require the suspension of food handlers until successfully treated.

10. Preparation and cooking

1. Defrosting of raw meat and poultry should be carried out in controlled conditions and not simply be left to thaw at room temperatures, particularly in a warm galley. Thawing should take place in a cool, clean area, separate from other foods that may be exposed to risk of contamination from thawed liquid. The food should be covered and stored in a container on a grille so that it is not resting in the thawed liquid. If there is a food handling room within the

cold stores area this may be used. It is important to check that meat or chicken etc is thoroughly defrosted before cooking.

2. Bacteria thrive in warm conditions, so raw meat, poultry, fish etc should not be left in the so called danger zone (5˚C - 63˚C) for longer than is absolutely necessary. A general rule when handling food during and after preparation would be a single period of up to 2 hours at room temperatures. In very high temperatures the handling period should be reduced to about 1½ hours.

3. Most harmful bacteria can be destroyed by thorough cooking. It is however acceptable to serve a "rare" steak, or beef and lamb joint if it is a whole cut or joint of meat and the steak or joint has been properly sealed over a high heat to destroy any bacteria that might be on the surface. The following types of meat can have bacteria distributed throughout the mass of the meat, they must therefore be cooked thoroughly:

   i. Poultry

   ii. Pork

   iii. Burgers, sausages, kebabs

   iv. Rolled joints using more than one cut

   v. Mincemeat

4. A skewer may be used to test that poultry and meat joints are thoroughly cooked; juices should run clear. A centre temperature of 75˚C is usually required and may be verified using a probe thermometer, the probe having been properly disinfected before use. Furthermore the thermometer's manufacturer's instructions must be followed and its accuracy verified.

5. Where practical, separate work surfaces should be set aside for the preparation of raw meat which should not be used for the preparation of foods that will be eaten without further cooking. If the same work surface has to be used, care must be taken to ensure it is cleaned and disinfected between handling raw and cooked meats or other ready-to-eat products. Separate chopping boards clearly assigned, generally, by colour may be used to maintain segregation.

11. Food Service

1. Ideally food should be consumed as soon as it is prepared /cooked but patterns of work and other unplanned factors can delay meal times. If there are significant delays, cold cuts can be stored in the fridge or in a chill display unit until the crew are ready to eat. Hot food can be safely left in the pot over a very low heat so long as it is regularly stirred to maintain a safe temperature of 63ºC or it can be stored in a hot press.

12. Leftovers

1. Cooling of high risk food must be done quickly to avoid potential health risks. Small amounts of food should cool relatively quickly but the process can be speeded up if necessary. For example,

   i. If available use a larder with a lower room temperature.

ii. Pour liquids into shallow pans and stir frequently.

iii. Split food into relatively small pieces or batches.

iv. Use an iced water bath.

2. Once cold, leftovers should be date marked and be suitably stored in a fridge and used within 2 days preferably served cold for example as part of a salad. If reheating is absolutely necessary food should be rapidly and thoroughly reheated, but only once. Reheated leftovers must have a core temperature of 75ºC.

13. Stores

1. Ships should have adequate storage facilities for all stores. If storage spaces are inadequate, stock levels should be reduced by taking on stores more frequently or if that is not possible, additional storage should be made available. All stock should be rotated as and when necessary.

14. Cold Stores

1. Safe temperatures for cold stores are generally considered to be 5˚C or colder and minus 18˚C or colder for chill and freezer cabinets respectively but a slight tolerance of one or two degrees is unlikely to create any significant risk to food safety. If cabinets do not have a means of checking temperatures, a suitable thermometer should be provided. Thermometers should be calibrated periodically but a simple check on a monthly basis, using boiling water (99ºC to 101ºC) or melting ice (-1ºC to +1ºC) will verify the accuracy of the thermometer.

2. In freezer units, the combination of high humidity and fluctuating temperatures (warmer than minus 10˚C) accelerate mould and other spoilage bacterial growth. Fluctuating temperatures may also cause an accumulation of ice deposits. Food should never be stored in front of cooling units as this restricts the circulation of air. Suitable packaging is essential to avoid the loss of moisture from the surface of food which can produce a freezer burn effect on exposed meat cuts or joints.

3. If defrosting is not an automatic process, equipment should be defrosted regularly to maintain its efficiency.

4. Although fridges and freezer cabinets should be maintained according to the ship's planned maintenance system, cooks and others working in the galley should regularly check the condition of door seals and closing devices as well as routinely monitoring temperatures.

5. Chilled raw food must always be kept apart from cooked food, for example, cooked food or milk that requires no further treatment before consumption. Separate refrigerators are preferred although if in the same unit, the raw food must always be placed at the bottom to avoid drip contaminating ready prepared food. Food should also be covered or wrapped to prevent drying out, cross-contamination and absorption of odour.

6. All refrigerated room doors should be fitted with means both of opening the door and sounding an alarm from the inside.

15. Dry Stores

1. Dry food stores should be dry, cool, (where possible around 10°C), well lit and ventilated. There should be adequate shelving and pallets to avoid stowage directly on to the deck. Care should be taken to ensure stock is used in strict date rotation and that supplies have the best

possible durability date. Perishable provisions should neither be ordered nor accepted in quantities greater than can be consumed before the expiry date. Daily checks should be made on short-life perishable food such as fresh fruit and vegetables.

16. Cleaning

1. To avoid a build up of dirt and waste, a "clean as you go" routine should be applied.
2. Trays, knives, cutting boards, food preparation machinery and work tops etc that come into contact with food should be thoroughly cleaned and disinfected. Mechanical dishwashers disinfect by virtue of the high rinse temperature. Where dishes are hand washed they should be left to dry rather than using drying cloths, as long as they are put away as soon as they are dry.
3. Cloths and towels are a perfect breeding ground for bacteria so they must be washed regularly or discarded. Mops and waste bins should also be regularly washed and stowed in designated places.
4. Galley spaces should be cleaned at the end of each working day. Time should be set aside to do a regular systematic thorough clean of all areas including cupboards, store rooms, the deck and bulk heads, extractor fans and canopies. Greasy ventilation ducting is a serious fire hazard and should therefore be cleaned regularly. The frequency of cleaning should be determined using a risk assessment process.
5. Care should be taken to protect food and equipment during cleaning operations. Cleaning products and equipment should be safely stored away, preferably in a designated locker.
6. Garbage and food waste segregation and disposal arrangements should maintain operational health and safety standards and be in accordance with the ship's garbage management plan.

17. Pests

1. Good housekeeping obviously minimises the risk of infestation and it is important to ensure that areas, particularly refuse areas are kept in a clean and tidy condition. Waste bins should be emptied regularly and lids should always be fitted unless they are being used. They should also be washed after emptying.
2. Flies, cockroaches and rodents present a serious hazard. Food suspected of being contaminated by rodents, flies or cockroaches must be destroyed.
3. A responsible member of crew should carry out routine inspections of food areas, particularly undisturbed areas. If pests are found appropriate action should be taken to eradicate or minimise the problem. This should include the use of a pest control book and if necessary the employment of a certified pest control agent.
4. Any treatments used should comply with the "Recommendations on the Safe Use of Pesticides in Ships".

Part 3: Water, including its supply, storage and distribution and directions on maintenance of water systems.

This Part covers fresh water loading and supply arrangements, disinfection, storage, distribution systems and maintenance.

6. General Requirements

Evidence of compliance

1. The shipowner is responsible for ensuring that water provided to the ship does not contain anything which is likely to cause sickness or injury to health or which renders any water unpalatable. In addition, a supply of hot, fresh water and cold drinking water should be provided to any sink, hand wash basin or other washing facilities in a galley.

2. Improperly managed water is an established infectious disease transmission route on ships. Outbreaks of illness have been associated with contaminated bunkered water, cross connections between potable and non-potable water, improper loading procedures, poor design and construction of potable water storage tanks and inadequate disinfection. Evidence from outbreaks indicates that sewage is one of the more common sources of the pathogens that cause waterborne disease outbreaks on ships. Care must therefore be taken to manage water properly as detailed in this part.

3. The most effective means of ensuring the safety of the fresh water supply is through the use of a risk assessment and management approach that covers the whole process from loading to delivery at the tap and includes a planned maintenance system. All of the information gathered should be used to develop a Fresh Water Safety Plan (FWSP), particularly for ships with a complex system, which could be incorporated into the ship's planned maintenance system. An FWSP should be based on the following format:

    1. system assessment and hazard analysis (including an assessment of source water loaded onto the ship);

    2. management plan and control measures (the selection and operation of appropriate treatment processes);

    3. monitoring and corrective action system in accordance with the plan (the prevention of contamination/re-contamination during storage and distribution);

4. Control measures (treatments) will be influenced by the quality of the source water.

5. In addition to the above the ship should consider requesting water samples from the supplier prior to bunkering.

7. Fresh water loading and supply arrangements

Evidence of compliance

1. Freshwater obtained from shore mains supply or water barge should be transferred by a designated fresh water hose. Hoses should be durable, with a smooth, impervious lining, and equipped with fittings, including adapters, to permit connection to the shore potable water hydrants and filling connections to prevent their use for loading other liquids. Hoses should be:

    1. clearly marked (generally coloured blue);

2. stowed in a locker clear of the deck;

3. drained and capped at both ends after use; and

4. flushed through and discharged to waste before loading.

2. Often ships use quayside hoses, in which case a designated crewmember should ensure that such hoses are in good condition and that they are routinely disinfected, safely stowed and capped in a clean environment.

3. Every potable water tank should have a filling line to which a hose can be attached. This line should not be cross-connected with any line of a non-potable water system. Each line should be clearly identified as such and painted blue with a screw cap or plug fastened by a short chain so that the cap does not touch the deck when hanging free.

8. Disinfection

Evidence of compliance

1. There should be no facility for by-passing primary automatic disinfection systems. Automatic disinfection systems should have a failsafe control arrangement with an audible/visual automatic alarm to prevent the passage of water in the event of any malfunction. The power supply required to operate the alarm should be independent of the disinfection unit power supply.

9. Chlorination

Evidence of compliance

1. The Isle of Man generally accepts chlorine as a disinfectant which requires around 20 minutes contact time to react. It can be the case that shore mains water only contains low concentrations of free chlorine which may be further decreased within the ship environment. Although there is no requirement to do so and control measures will be influenced by the quality of the source water, it is considered good practice to add chlorine as a routine when loading fresh water to a level that produces a 0.2 mg/L (ppm) residual free chlorine or 1.0 mg/L (ppm) chloramine when chloraminated water is supplied. Chlorine should preferably be applied as a hypochlorite solution, using a commercial hypo chlorinator designed for the purpose or by using an automatic chlorination unit in the ship's deck filling line. The concentration may also be achieved by the manual method using the formula contained in the "WHO's Guide to Ship Sanitation". A commercial test kit should be used to check the free chlorine or chloramine levels.

10. Silver-coated filter candles

Evidence of compliance

1. These filters retain suspended matter and they have a bactericidal effect. Treatment is instantaneous without any addition of chemicals.

11. Electro-Silver Ionisation

Evidence of compliance

1. Electro-silver ionisation may be used for the automatic disinfecting of fresh water produced on board ships. Units should be set up by the manufacturer to ensure a minimum concentration of 0.1ppm to be added to the water under maximum flow conditions. The minimum time required for silver to take effect is 4 hours after passing through the unit. This should ensure a maximum 0.08 ppm in the system

12. Ultra-Violet Sterilisation

Evidence of compliance

1. Although the sterilisation process is instantaneous, ultra-violet steriliser units have no dispersal or residual properties. For this reason UV treatment is generally used only as a supplementary system, fitted downstream of the water tank or supply pump. UV units may however be effective in certain cases where service lines are relatively short. They should be installed so that the direction of flow is vertical to keep deposits in the tubes to a minimum. The water should be continuously circulated in the system through the UV unit. There should be a means to measure the intensity of UV radiation and a switch-off mechanism with an alarm should be fitted in the event of UV radiation being too weak. The performance of the tubes should be regularly monitored.

13. Thermal Disinfection (Calefaction)

Evidence of compliance

1. Potable water supply lines contaminated with Legionella may not be reliably disinfected by means of chemical agents. Heating the flowing water throughout the distribution system (Legionella tends to grow in dead legs and low-use areas) to a temperature of at least 60°C and maintaining this temperature for 30 minutes is another established method used to destroy the Legionella bacteria. If the water temperature is increased the period for maintaining the temperature will be proportionately reduced. This method may be used in conjunction with chemical treatments.

14. Fresh water production on board

Evidence of compliance

1. Sea water that is to be treated on ships should be taken from areas relatively free from pollution, including air pollution. Twenty miles from land is generally considered to be a safe distance but it may be in excess of the twenty miles in some cases. Judgement should be used based on a risk assessment which should include consideration of the possible effect that ship operations might have on the quality of the water intake.

2. The seawater inlets (sea chests) should be located forward and if possible on the opposite side of the ship from all overboard waste water and ballast tanks discharge outlets. Sea water should pass through suitable filters before entering the water making equipment.

3. The manufacturer's operating instructions should be clearly posted in the plant room and strictly followed.

4. By-passes should not be installed around treatment units except where necessary as part of the treatment process. There should be an adequate store of spare replacement parts particularly for any vital or fragile parts. Distillation units should indicate low range salinity levels, operational temperature levels and have an automatic discharge to waste. They should also have an alarm with trip setting or equivalent.

5. Any chemicals used in an injection system to a sea suction intended to prevent the growth of organisms in the ship's piping system serving water making plant should be suitable for that purpose.

6. High pressure distillation and reverse osmosis plants are highly effective in removing micro-organisms and chemical constituents. They can therefore be employed as a single treatment so long as they remain effective. There is a need for highly reliable on-line monitoring linked to rapid management intervention. They can however be combined with the application of a low level of residual chlorine or other equivalent disinfectant. Because low pressure evaporators operate at lower temperatures, this type of plant should be fitted with an automatic disinfecting unit, generally chlorine or electro silver ionisation is used, before it is pumped to the storage tanks.

7. Desalinated water effectively demineralises the seawater which makes it corrosive with the potential to damage lines, tanks etc. Also the taste of desalinated water is bland, and may be considered unpalatable. Appropriate stabilising and mineralising chemical treatments should therefore be applied before the water is passed into the storage tank.

15. Filtration

Evidence of compliance

1. Filters should be used only where necessary as part of a purification system that includes disinfection. Terminal or tap filters often collect bacteria and accelerate its growth and for this reason their use should be discouraged unless they can be disinfected or replacement cartridges are used. Filters should be maintained or replaced according to manufacturer's instructions.

16. Water storage and distribution systems

Evidence of compliance

1. Potable water storage tanks

    1. Storage tanks should normally be sited above the inner bottom and independent of the hull and not adjacent to tanks containing oil. They should be sited and be of such dimensions that they are readily accessible to facilitate inspection, cleaning and coating.

    2. Tanks should be clearly marked "Potable Water". They should be used in regular rotation to avoid stagnation.

    3. Storage should normally never be less than a 2 day supply. Consideration should be given to the size of the ship's complement of officers and crew, the maximum number of passengers, the time and distance between ports of call and the availability of water suitable for treatment with facilities aboard. Storage may be decreased if the water supply can be supplemented by water produced by water making plants, but only to the amount that can be reliably supplied by the water making plant.

4. Coatings systems other than cement should be specially developed for use in potable water tanks. Manufacturer's recommendations for application and drying or curing of the coating must be followed. All items that penetrate the tank, for example bolts, pipes, pipe flanges should be coated with the same product.

2. Distribution systems

    1. The freshwater distribution pumps should not be capable of being connected to any other service. The suction lines of the pumps should not be cross-connected with the piping or storage tank of any non-potable-water system. Lines should not be submerged in bilge water, or pass through tanks storing non-potable liquids. Overflows, vents and drains from tanks, and drains from the distribution system (including any treatment plant) should not be connected directly to sewage drains.

    2. Potable water piping should be painted or hatched blue. If the direction of flow is important, this shall be shown by means of an arrow pointing in the respective direction. Potable water outlets should be labelled POTABLE WATER. All non-potable outlets should be labelled UNFIT FOR DRINKING. If hot water piping and cold water piping run adjacent to one another, appropriate thermal insulation should be carried out.

    3. Calorifiers and pressure tanks should be fitted with efficient connections at the lowest point of the unit so that loose scale or sludge can be completely drained off after cleaning and maintenance. They should have adequate access to enable thorough cleaning.

    4. The design of the distribution system should provide maximum circulation, avoiding dead legs and optimum conditions for bacterial growth (15°C to 50°C). The risk increases where sections of the system are not kept in continuous use. To minimise the risk a ring main system with circulation pumps in hot and cold water lines should be considered for large scale demand such as passenger ships for example.

    5. Corrosion and scale inhibitors if used should be suitable for use in fresh water systems.

3. Taps and other fixtures

    1. Fixtures should be resistant to the corrosive effects of salt water and saline atmosphere and fit for use with fresh water systems. They should be easy to clean and designed to function easily and efficiently. Approved mixer taps should be fitted to showers and it is recommended that hand wash basins should have hot and cold mixer taps.

17. Maintenance of water systems

Evidence of compliance

1. All elements of the freshwater production, treatment and delivery system including filters, pumps, calorifiers, pressure tanks etc should be inspected, cleaned, flushed out, or items replaced where appropriate, according to the manufacturer's instructions and the planned maintenance system.

The following should be taken into account when maintaining fresh water tanks and distribution systems:

Freshwater Storage Tanks (FW tanks)

Persons inspecting or working in freshwater tanks should wear clean protective clothing and footwear which has not been used for any other work area and they should not be suffering from any skin infection or communicable disease.	
Actions	**Intervals**
To be thoroughly pumped out and where necessary hosed prior to refilling.	6 monthly
To be opened up, emptied, ventilated inspected and thoroughly cleaned, recoated as necessary, aired and refilled with clean freshwater chlorinated to a concentration of 0.2ppm free chlorine. The cleaning process should include disinfection with a solution of 50ppm chlorine.	12 monthly
The system (from machinery space to furthest outlets) should be charged with super-chlorinated freshwater at a concentration of 50ppm for a period of 12 hrs and then completely flushed out and refilled at 0.2ppm residual free chlorine.	Refit or drydock
Pressure Tests on all FW tanks (After the pressure test, the system to be thoroughly flushed with potable water).	Intervals not greater than 5 years

Distribution Systems Maintenance

Parts	**Actions**	**Intervals**
Filters	Clean Change	Monthly or according to manufacturer's instructions
UV exposure area	Clean	According to manufacturer's instructions
Calorifiers	To be opened up, inspected scaled and cleaned. Before draining temperatures should be raised to 70˚C for at least an hour to ensure destruction of bacteria which may have colonised the lower and cooler zone of the unit.	Periodically (general recommendation - annual inspection)
Shower heads	Particularly in accommodation that has been out of use for an extended period. Clean in a 50ppm chlorine solution.	3 monthly
FW Hoses	Flush and fill with 50ppm chlorine solution and allow to stand for at least an hour before emptying and stowage.	6 monthly or more frequent if required.

18. Inspection requirements

Evidence of Compliance

1. Inspections should be carried out by or under the authority of the Master, at intervals not exceeding 7 days. The matters to be inspected should include as a minimum:
    1. supplies of food and drinking water;
    2. all spaces and equipment used for the storage and handling of food and drinking water; and
    3. galley and other equipment for the preparation and service of meals.
2. The officer carrying out the inspections should be accompanied by at least one other seafarer involved in catering. Records of the inspections should be kept on board and contain the following information:
    1. time and date of inspection;
    2. name and rank of persons making the inspection; and
    3. any findings recorded in the Isle of Man official log book.

19. Health and Safety

Evidence of compliance

1. Adequate care should be taken when handling chemicals or biological agents, for example chemicals, corrosion inhibitors, filters etc. Suitable risk assessments and control measures should be applied.
2. The rules for classification and construction of seagoing ships stated by the relevant classification societies should be observed. Reference should also be made to the following British Standards in relation to sanitary design and construction of ship water supplies obtainable on the internet at www.iso.org/iso/en/ISOOnline .
3. ISO 15748-1: 2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 1: Planning and design.
4. ISO 15748-2: 2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 2: Method of calculation.

This Guide provides advice on a number of topics, including the management of swimming pools and spas on board ships, and is available on the internet as a draft at:
http://www.who.int/water_sanitation_health/publications/2011/ship_sanitation_guide/en/index.html

The HSE Approved Code of Practice and Guidance for the Control of Legionella Bacteria in Water Systems.

This guide provides practical advice for the control of Legionella bacteria in any undertaking involving a work activity and to premises controlled in connection with a trade, business or other undertaking where there is a reasonably foreseeable risk of exposure to Legionella bacteria. Although the Code of Practice is not specific to a marine environment, it does provide advice about prevention or controlling exposure to the bacteria and treatment and control programmes. The Code of Practice may be obtained from the Health and Safety Executive (www.hse.gov.uk)