

Vessel Sanitation Program 2018 Operations Manual



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The *VSP 2018 Operations Manual* and updates are available at www.cdc.gov/nceh/vsp.

Use of trade names is for identification only and does not imply endorsement by the Centers for Disease Control and Prevention, the Public Health Service, or the U.S. Department of Health and Human Services.

Information that has changed from the 2011 version of the *VSP Operations Manual* is marked with a

Foreword

The Centers for Disease Control and Prevention (CDC) established the Vessel Sanitation Program (VSP) in the 1970s as a cooperative activity with the cruise ship industry. The program assists the cruise ship industry in fulfilling its responsibility for developing and implementing comprehensive sanitation programs to minimize the risk for acute gastroenteritis. Every vessel that has a foreign itinerary and carries 13 or more passengers is subject to twice-yearly unannounced inspections and, when necessary, reinspection.

VSP operated continuously at all major U.S. ports from the early 1970s through 1986, when CDC terminated portions of the program. Industry and public pressures resulted in Congress directing CDC through specific language included in CDC appropriations to resume the program. CDC's National Center for Environmental Health (NCEH) became responsible for VSP in 1986.

NCEH held a series of public meetings to determine the needs and desires of the public and cruise ship industry and on March 1, 1987, a restructured program began. In 1988, the program was further modified by introducing user fees to reimburse the U.S. government for costs. A fee based on the vessel's size is charged for inspections and reinspections. A *VSP Operations Manual* based on the Food and Drug Administration (FDA) 1976 model code for food service and the World Health Organization's *Guide to Ship Sanitation* was published in 1989 to assist the cruise ship industry in educating shipboard personnel.

In 1998, it became apparent that it was time to update the 1989 version of the *VSP Operations Manual*. Changes in the FDA *Food Code*, new science on food safety and protection, and newer technology in the cruise ship industry contributed to the need for a revised operations manual. Over the next 2 years, VSP solicited comments from and conducted public meetings with representatives of the cruise industry, the general public, FDA, and the international public health community to ensure that the 2000 manual would appropriately address current public health issues related to cruise ship sanitation. A similar process was followed to update the *VSP 2000 Operations Manual* in 2005 and the *VSP 2005 Operations Manual* in 2011.

Although the *VSP 2011 Operations Manual* was in use for almost 6 years, new technology, advanced food science, and emerging pathogens require updates to the manual. The *VSP 2018 Operations Manual* reflects comments and corrections submitted by cooperative partners in government and private industry as well as the public. We would like to thank all those who submitted comments and participated throughout this process.

As new information, technology, and input are received, we will continue to review and record that information and maintain a public process to keep the *VSP Operations Manual* current.

The *VSP 2018 Operations Manual* continues the more than 40 years of government and industry working together to achieve a successful and cooperative program that benefits millions of travelers each year.

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Vessel Sanitation Program

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Information to Assist the User on the Manual Format

Organization

The *Vessel Sanitation Program Operations Manual* is divided into chapters and subsections that focus on each operational area important to safeguarding public health aboard vessels.

Section Number

The international numbering system is used to organize the guidelines in this document.

Keywords

Each guideline is formatted with a title, keyword, or phrase after the section number.

Description

The public health compliance recommendation is provided in this statement.

Green Bold Text

Portions of some sections of these guidelines are written in **green bold**. These provisions are not requirements. They are provided to convey relevant information about specific exceptions and alternative means for compliance.

Inspection Report Number

The individual inspection report item number is shown in parentheses after the section number and keywords; for example, 7.2.5.1.1 Hair Restraints (14).

Critical Items

Critical compliance items are written in **bold red underlined text** in parentheses after the section number and keywords; for example, **7.5.5.1 Food-Contact Surfaces (24 C)**. The number in parentheses is the individual inspection report item number.

Noncritical Items

Noncritical compliance items are the other items in this manual.

Changes

Information that has changed from the 2011 version of the *VSP Operations Manual* is marked with a yellow highlight and a vertical rule.

Manual Update Process

Revisions to the *VSP Operations Manual* and *VSP Construction Guidelines* are made via a change request process. Change requests include information on the public health significance for the reason and benefit of the suggested change. They are also substantiated based on technical information, published scientific studies, evidence of experience, and other references.

To update these versions of the documents, VSP provided a change request form format and instructions to industry partners March 2015 for revisions. VSP and stakeholders held 14 days of in-person meetings and two web-based meetings between April 2015 and October 2016 to review the change requests. During these meetings, submitters presented their changes and discussed the reasons and evidence for requesting the changes. During group discussion, VSP accepted change requests as submitted, accepted them as amended, or did not take action.

A total of 307 change requests were submitted during the review process for the *VSP Operations Manual* and *VSP Construction Guidelines*. Of these, 112 were accepted as submitted or as amended, and 34 were withdrawn.

After the revision meetings ended, VSP staff updated the documents, sent drafts to industry for a 45-day review period, and announced availability of the documents for review in the *Federal Register*.

1.0 Introduction

This section includes the following subsections:

- 1.1 Introduction and Background
- 1.2 Activities
- 1.3 Operations Manual

1.1 Introduction and Background

1.1.1 Cooperative Activity

1.1.1.1 History

The Centers for Disease Control and Prevention (CDC) established the Vessel Sanitation Program (VSP) in 1975 as a cooperative activity with the cruise ship industry. This program assists the cruise ship industry in fulfilling its responsibility for developing and implementing comprehensive performance-based systems to protect the health of the traveling public.

1.1.1.2 Cooperation

The program fosters cooperation between the cruise ship industry and government to define and reduce health risks associated with vessels and to ensure a healthful and clean environment for vessels' passengers and crew. The industry's aggressive and ongoing efforts to achieve and maintain high standards of FOOD safety and environmental sanitation are critical to the success of protecting public health.

1.2 Activities

1.2.1 Prevention

1.2.1.1 Inspections

VSP conducts a comprehensive FOOD safety and environmental sanitation inspection on vessels that have a foreign itinerary, call on a U.S. port, and carry 13 or more passengers.

1.2.1.2 Surveillance

The program conducts ongoing surveillance of ACUTE GASTROENTERITIS (AGE) and coordinates/conducts OUTBREAK investigations on vessels.

1.2.2 Information

1.2.2.1 Training

VSP provides FOOD safety and environmental sanitation training

seminars for vessel and shore operations management personnel.

1.2.2.2 Plan Review

The program provides consultative services for reviewing plans for renovations and new construction.

1.2.2.3 Construction Inspections

The program conducts construction inspections at the shipyards and when the vessel makes its initial call at a U.S. port.

1.2.2.4 Information

The program disseminates information to the public.

1.3 Operations Manual

1.3.1 Revisions

1.3.1.1 Manual

The *VSP 2018 Operations Manual* has been modified to address emerging public health issues, industry recommendations, introduction of new technologies within the industry, new guidance from sources used in the previous edition, and CDC's experience.

1.3.1.2 Program Guidance

Program operations and inspections are based on this manual.

1.3.1.3 Periodic Review

The *VSP 2018 Operations Manual* will be reviewed at the annual meeting with written submissions for revision based on emerging public health issues and new technologies that may better address the public health issues on vessels.

1.3.1.3.1 Clarifications

VSP will circulate proposed clarifications to the operations manual along with supporting information on their public health significance in advance of the annual meeting. These clarifications will be considered during the meeting.

Proposed clarifications VSP considers time critical can be circulated to the industry and others for review and coordination through other collaborative means (e.g., email, web-based forum, etc.) for more timely dissemination and further review, as needed, during the annual meeting.

2.0 Authority

This section includes the following subsections:

- 2.1 Public Health Service Act
- 2.2 Jurisdiction

2.1 Public Health Service Act

2.1.1 Communicable Disease Prevention

2.1.1.1 Communicable Disease Prevention

Although cooperation by vessels with VSP is voluntary, the Public Health Service (PHS) is authorized by the Public Health Service Act (42 U.S.C. Section 264. QUARANTINE and Inspection - Regulations to control communicable diseases) to take measures necessary to prevent the introduction, TRANSMISSION, or spread of communicable diseases into the United States from a foreign country.

2.1.1.2 Regulation Promulgation

In addition, the Public Health Service Act (42 U.S.C. Section 269. QUARANTINE and Inspection - Bills of Health) authorizes the promulgation of regulations applicable to vessels for preventing the introduction into the United States of “any communicable disease by securing the best sanitary condition of such vessels, their cargoes, passengers, and crews.”

2.1.1.3 Inspections

Regulations promulgated to carry out these duties authorize PHS to conduct sanitary inspections on carriers traveling to a U.S. port from a foreign area (42 CFR Section 71.41. General Provisions, Foreign QUARANTINE - Requirements Upon Arrival at U.S. Ports: Sanitary Inspection). The purpose of the inspection is to determine the existence of vermin, contaminated FOOD or water, or other insanitary conditions that may contribute to the introduction, spread, or TRANSMISSION of communicable disease.

2.2 Jurisdiction

VSP’s mission is to prevent AGE TRANSMISSION to U.S. ports by ships sailing from foreign ports. Cruise lines should be aware that although ships sail outside of U.S. waters, there could be occasions when a ship violates the *VSP Operations Manual* while sailing outside of the United States and this violation has a potential to impact a U.S. port. During an operational inspection, VSP must review both present and past practices to evaluate the ship’s compliance with the requirements set out in the *VSP Operations Manual*.

The *VSP Operations Manual* requires several types of records to be maintained on board for periods of 30 days to 1 year, including the following:

- Medical.
- POTABLE WATER.
- Recreational water.
- FOOD safety.
- Housekeeping.

These records are reviewed during operational inspections. VSP has and will continue to cite violations identified in the record review, even if the ship was not sailing in U.S. waters when the violation occurred. If the record review reveals violations that could result in illness when the ship arrives in a U.S. port, points may be deducted according to the violations identified during the inspection. An example of these violations is ships producing water in ports, HARBORS, and polluted waterways.

3.0 Definitions

This section includes the following subsections:

- 3.1 Scope
- 3.2 Definitions
- 3.3 Acronyms

3.1 Scope

This *VSP 2018 Operations Manual* provides definitions to clarify commonly used terminology in this manual. The definition section is organized alphabetically. Where a definition specifically applies to a section of the manual, it will be noted in the definition.

Terms defined in section 3.2 are identified in the text of these guidelines by CAPITAL LETTERS. For example, section 5.7.1.1.4 states “A CROSS-CONNECTION control program must include at a minimum: ...” CROSS-CONNECTION is in CAPITAL LETTERS and is defined in section 3.2.

3.2 Definitions

Accessible: Exposed for cleaning and inspection with the use of simple tools including a screwdriver, pliers, or wrench. This definition applies to use in FOOD AREAS of the vessel only.

Accredited program: A FOOD protection manager certification program that has been evaluated and listed by an accrediting agency as conforming to national standards for organizations that certify individuals.

- An accredited program refers to the certification process and is a designation based on an independent evaluation of factors such as the sponsor’s mission; organizational structure; staff resources; revenue sources; policies; public information regarding program scope, eligibility requirements, recertification, discipline and grievance procedures; and test development and administration.
- Accredited program does not refer to training functions or educational programs.

Activity pools: An indoor or outdoor RECREATIONAL WATER FACILITY that provides flowing water without any additional features. This includes wave pools, catch pools, open water slides, lazy rivers, action rivers, vortex pools, continuous surface pools, etc.

Acute gastroenteritis (AGE): Irritation and inflammation of the digestive tract characterized by sudden onset of symptoms of diarrhea and/or vomiting, as well as other constitutional symptoms such as fever, abdominal cramps, headache, or muscle aches.

AGE case: See REPORTABLE AGE CASE.

AGE outbreak: Cases of ACUTE GASTROENTERITIS, characterized by diarrhea and vomiting, that are in excess of background rates. For the purposes of this manual, more than 3% is considered in excess of background rates. In addition, an AGE outbreak may be based on two or more laboratory-confirmed cases associated with FOOD or water consumption during the cruise.

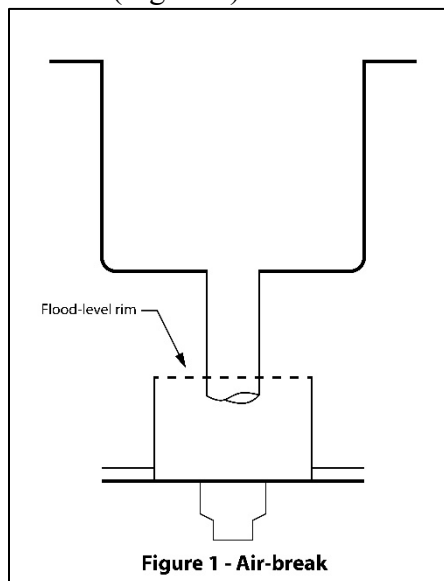
Additive

- **FOOD additive:** as stated in the Federal FOOD, Drug, and Cosmetic Act, §201(s) and 21 CFR 170.
- **Color additive:** as stated in the Federal FOOD, Drug, and Cosmetic Act, §201(t) and 21 CFR 70.

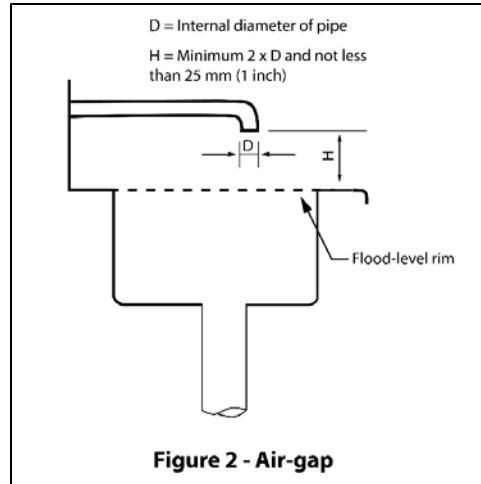
Adequate: Sufficient in number, features, or capacity to accomplish the purpose for which something is intended and to such a degree that there is no unreasonable risk to health or safety.

Adulterated: As stated in the Federal FOOD, Drug, and Cosmetic Act, §402.

Air-break: A piping arrangement in which a drain from a fixture, appliance, or device discharges indirectly into another fixture, receptacle, or interceptor at a point below the flood-level rim (Figure 1).



Air gap (AG): The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, PLUMBING FIXTURE, or other device and the flood-level rim of the receptacle or receiving fixture. The AIR GAP must be at least twice the inside diameter of the supply pipe or faucet and not less than 25 millimeters (1 inch) (Figure 2).



Antientanglement cover: A cover for a drain/SUCTION FITTING designed to prevent hair from tangling in a drain cover or SUCTION FITTING in a RECREATIONAL WATER FACILITY.

Antientrapment cover: A cover for a drain/SUCTION FITTING designed to prevent any portion of the body or hair from becoming lodged or otherwise forced onto a drain cover or SUCTION FITTING in a RECREATIONAL WATER FACILITY.

Approved: Acceptable based on a determination of conformity with principles, practices, and generally recognized standards that protect public health, federal regulations, or equivalent international standards and regulations. Example of these standards include those from the American National Standards Institute (ANSI), National Sanitation Foundation International (NSF International), American Society of Mechanical Engineers (ASME), American Society of Safety Engineers (ASSE), and Underwriter's Laboratory (UL).

Attack rate: (1) The proportion of individuals exposed to an infectious agent who become clinically ill. (2) The cumulative incidence of infection in a group observed over a period during an epidemic.

Atmospheric vacuum breaker (AVB): A BACKFLOW PREVENTION DEVICE that consists of an air inlet valve, a check seat or float valve, and air inlet ports. The device is not APPROVED for use under continuous water pressure and must be installed downstream of the last valve.

Automatic pump shut-off (APS): System device that can sense a BLOCKABLE DRAIN blockage and shut off the pumps in a RECREATIONAL WATER FACILITY.

A_w (water activity): Measurement of the free moisture content in a FOOD.

Baby-only water facility: RECREATIONAL WATER FACILITY designed for use by children in diapers or who are not completely toilet trained. This facility must have zero water depth. Control measures for this facility would be detailed in a VARIANCE.

Backflow: The reversal of flow of water or other liquids, mixtures, or substances into the distribution pipes of a potable supply of water from any source or sources other than the source of POTABLE WATER supply. BACKSIPHONAGE and BACKPRESSURE are forms of backflow.

Backflow prevention device: An APPROVED backflow prevention plumbing device that must be used on POTABLE WATER distribution lines where there is a direct connection or a potential CROSS-CONNECTION between the POTABLE WATER distribution system and other liquids, mixtures, or substances from any source other than the POTABLE WATER supply. Some devices are designed for use under continuous water pressure, whereas others are noncontinuous pressure types.

(See also:

- ATMOSPHERIC VACUUM BREAKER [AVB].
- CONTINUOUS PRESSURE BACKFLOW PREVENTION DEVICE.
- DUAL CHECK VALVE with intermediate atmospheric vent.
- HOSE BIB CONNECTION VACUUM BREAKER.
- PRESSURE VACUUM BREAKER ASSEMBLY.
- REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY.)

Backpressure: An elevation of pressure in the downstream piping system (by pump, elevation of piping, or steam and/or air pressure) above the supply pressure at the point of consideration that would cause a reversal of normal direction of flow.

Backsiphonage: The reversal or flowing back of used, contaminated, or polluted water from a PLUMBING FIXTURE or vessel or other source into a water supply pipe as a result of negative pressure in the pipe.

Barometric loop: A continuous section of supply piping that rises at least 35 feet above the supply point and returns back down to the supply. Typically the loop will be in the shape of an upside-down “U.” A barometric loop only protects against BACKSIPHONAGE because it operates under the principle that a water column cannot rise above 33.9 feet at sea-level pressure.

Beverage: A liquid for drinking, including water.

Black water: Wastewater from toilets, urinals, medical sinks, and other similar facilities.

Blast chiller: A unit specifically designed for rapid intermediate cooling of FOOD products from 57°C (135°F) to 21°C (70°F) within 2 hours and 21°C (70°F) to 5°C (41°F) within an additional 4 hours.

Blockable drain/suction fitting: A drain or suction fitting in a RECREATIONAL WATER FACILITY that that can be completely covered or blocked by a 457 millimeter x 584 millimeter (18 inch x 23 inch) body-blocking element as set forth in ASME A112.19.8M.

Bulkhead: A dividing wall covering an area constructed from several panels, also known as the visible part of the lining.

Certified data security features: Features that ensure the values recorded by the data logger cannot be manipulated by the user.

CFR (Code of Federal Regulations): Compilation of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. The CFR is published annually by the U.S. Government Printing Office and contains FDA rules in 21 CFR, USDA rules in 7 CFR and 9 CFR, EPA rules in 40 CFR, and Wildlife and Fisheries rules in 50 CFR.

Chemical disinfectant: A chemical agent used to kill microbes.

Child activity center: A facility for child-related activities where children under the age of 6 are placed to be cared for by vessel staff.

Children’s pool: A pool that has a depth of 1 meter (3 feet) or less and is intended for use by children who are toilet trained.

Child-size toilet: Toilets whose toilet seat height is no more than 280 millimeters (11 inches) and the toilet seat opening is no greater than 203 millimeters (8 inches).

CIP (cleaned in place): Use of a detergent solution, water rinse, and sanitizing solution by circulating or flowing mechanically through a piping system onto or over EQUIPMENT surfaces that require cleaning (for example, the method used—in part—to clean and sanitize a frozen dessert machine). **CIP does not include the cleaning of EQUIPMENT such as band saws, slicers, or mixers subjected to in-place manual cleaning without the use of a CIP system.**

Cleaning locker: A room or cabinet specifically designed or modified for storage of cleaning EQUIPMENT such as mops, brooms, floor-scrubbing machines, and cleaning chemicals.

Comminuted: Reduced in size by chopping, flaking, grinding, or mincing. **Examples include FISH or MEAT products reduced in size and restructured or reformulated (e.g., gefilte FISH, gyros, ground beef, and sausage) and mixtures of two or more types of MEAT that have been reduced in size and combined (e.g., sausages made from two or more MEATS).**

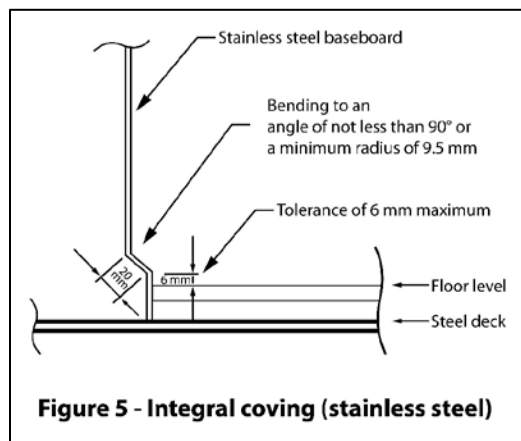
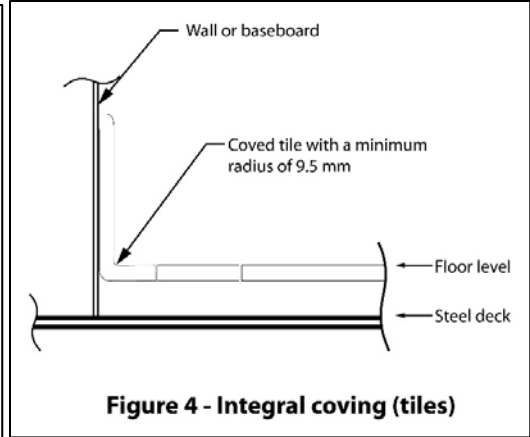
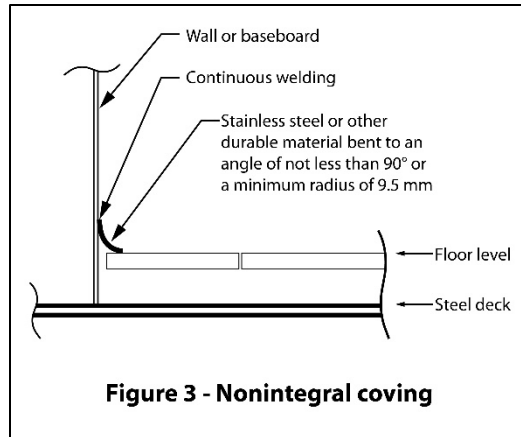
Confirmed disease outbreak: A FOODBORNE or WATERBORNE DISEASE OUTBREAK in which laboratory analysis of appropriate specimens identifies a causative agent and epidemiologic analysis implicates the FOOD or water as the source of the illness.

Consumer: A person who takes possession of FOOD, is not functioning as an operator of a FOOD establishment or FOOD-PROCESSING PLANT, and does not offer the FOOD for resale.

Contamination: The presence of an infectious agent on a body surface, in clothes, in bedding, on toys, on surgical instruments or dressings, or on other inanimate articles or substances including FOOD and water.

Continuous pressure (CP) backflow prevention device: A device generally consisting of two check valves and an intermediate atmospheric vent that has been specifically designed to be used under conditions of continuous pressure (greater than 12 hours out of a 24-hour period).

Coving: A concave surface, molding, or other design that eliminates the usual angles of 90° or less at deck junctures (Figures 3, 4, and 5).



Critical item: A provision of these guidelines that, if in noncompliance, is more likely than other deficiencies to contribute to FOOD or water CONTAMINATION, illness, or environmental HEALTH HAZARD. These are denoted in these guidelines in **bold red underlined text** in parentheses after the section number and keywords; for example, **7.5.5.1 Food-Contact Surfaces (24 C)**. The number indicates the individual inspection report item number.

Critical control point: A point or procedure in a specific system where loss of control may result in an unacceptable health risk.

Critical limit: The maximum or minimum value at a CRITICAL CONTROL POINT to which a physical, biologic, or chemical parameter must be controlled to minimize the occurrence of risk from an identified safety HAZARD.

Cross-connection: An actual or potential connection or structural arrangement between a POTABLE WATER system and any other source or system through which it is possible to introduce into any part of the POTABLE WATER system any used water, industrial fluid, gas, or substance other than the intended POTABLE WATER with which the system is supplied.

CT value: Numerical value used for identifying level at which pathogen destruction/inactivation occurs. **For the purposes of this manual, CT values will be based on free chlorine levels in MG/L (ppm) and time in minutes (CT value=MG/L x minutes).**

Cut leafy greens: Fresh leafy greens whose leaves have been cut, shredded, sliced, chopped, or torn. Leafy greens include iceberg lettuce, romaine lettuce, leaf lettuce, butter lettuce, baby leaf lettuce (that is, immature lettuce or leafy greens), escarole, endive, spring mix, spinach, cabbage, kale, arugula, and chard. Herbs such as cilantro or parsley are not considered leafy greens.

Date/time of onset: Date/time on which the first symptom appeared.

Deck drain: The physical connection between decks, SCUPPERS, or DECK SINKS and the GRAY WATER or BLACK WATER systems.

Deckhead: The deck overhead covering the ceiling area constructed from several panels, also known as the visible part of the ceiling.

Deck sink: A sink recessed into the deck and sized to contain waste liquids from tilting kettles and pans.

Diarrheal disease: Three or more episodes of loose stools in a 24-hour period or a greater than normal (for the person) number of loose stools.

Disinfectant: A chemical or physical agent used to kill microbes.

Disinfection: A process (physical or chemical) that destroys many or all pathogenic microorganisms, except bacterial and mycotic spores, on inanimate objects.

Distillate water: Water condensed from vapor during the evaporation process.

Distillate water lines: Pipes carrying water condensed from the evaporators and that may be directed to the POTABLE WATER system. This is the VSP definition for pipe striping purposes.

Double check (DC) valve assembly: A BACKFLOW PREVENTION ASSEMBLY consisting of two internally loaded, independently operating check valves located between two resilient-seated shutoff valves. These assemblies include four resilient-seated test cocks. **These devices do not have an intermediate vent to the atmosphere and are not APPROVED for use on CROSS-CONNECTIONS to the POTABLE WATER system of cruise vessels. VSP accepts only vented BACKFLOW PREVENTION DEVICES.**

Dual check valve with an intermediate atmospheric vent (DCIV): A BACKFLOW PREVENTION DEVICE with dual check valves and an intermediate atmospheric vent located between the two check valves.

Drinking water: See POTABLE WATER.

Drip tray: READILY REMOVABLE tray to collect dripping fluids or FOOD from FOOD dispensing EQUIPMENT.

Dry storage area: A room or area designated for the storage of PACKAGED or containerized bulk FOOD that is not potentially hazardous and dry goods such as SINGLE-SERVICE ITEMS.

Easily cleanable: A characteristic of a surface that

- Allows effective removal of soil by normal cleaning methods;
- Is dependent on the material, design, construction, and installation of the surface; and
- Varies with the likelihood of the surface's role in introducing pathogenic or toxigenic agents or other contaminants into FOOD based on the surface's APPROVED placement, purpose, and use.

Easily movable: EQUIPMENT that

- Is PORTABLE or mounted on casters, gliders, or rollers or has a mechanical means to safely tilt it for cleaning; and
- Has no utility connection, a utility connection that disconnects quickly, or a flexible utility connection line of sufficient length that allows it to be moved for cleaning of the EQUIPMENT and adjacent area.

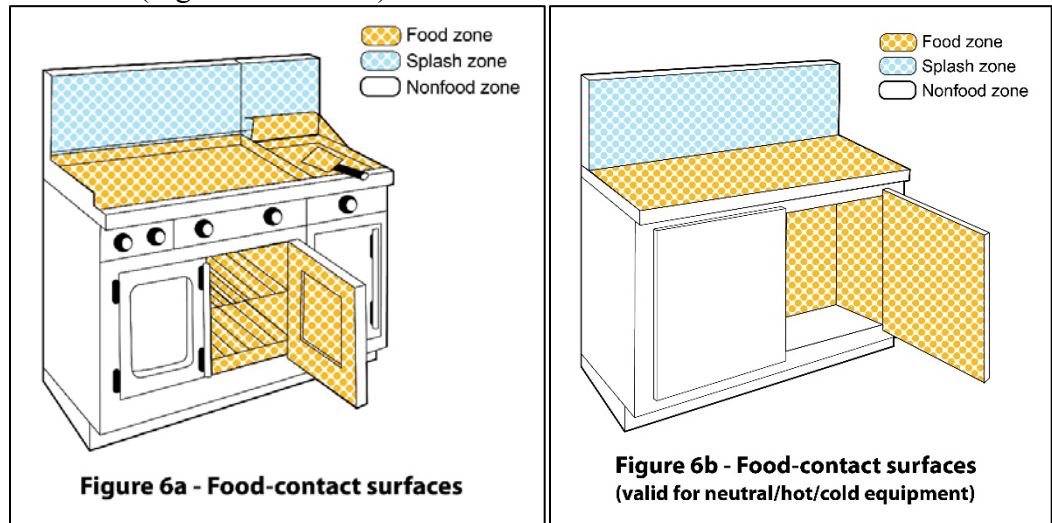
Equipment: An article used in the operation of a FOOD establishment, such as a freezer, grinder, hood, ice maker, MEAT block, mixer, oven, reach-in refrigerator, scale, sink, slicer, stove, table, TEMPERATURE-MEASURING DEVICE for ambient air, vending machine, or WAREWASHING machine. **Equipment does not include items used for handling or storing large quantities of PACKAGED FOODS received from a supplier in a cased or overwrapped lot, such as hand trucks, forklifts, dollies, pallets, racks, and skids.**

Fish: Fresh water or saltwater finfish, crustaceans, and other forms of aquatic life (including alligator, frog, aquatic turtle, jellyfish, sea cucumber, sea urchin, and the roe of such animals) other than birds or mammals, and all mollusks, if such animal life is intended for human consumption. **Fish includes an edible human FOOD product derived in whole or in part from fish, including fish processed in any manner.**

Food: Raw, cooked, or processed edible substance; ice; BEVERAGE; or ingredient used or intended for use or for sale in whole or in part for human consumption. Chewing gum is classified as FOOD.

Food area: Includes food and BEVERAGE display, handling, preparation, service, and storage areas; warewash areas; clean EQUIPMENT storage areas; and LINEN storage and handling areas.

Food-contact surface: Surfaces (food zone, splash zone) of EQUIPMENT and UTENSILS with which food normally comes in contact and surfaces from which food may drain, drip, or splash back into a food or surfaces normally in contact with food (Figures 6a and 6b).



Food display areas: Any area where food is displayed for consumption by passengers and/or crew. Applies to displays served by vessel staff or self-service.

Food employee: A person working with unpackaged food, food EQUIPMENT or UTENSILS, LINENS, or FOOD-CONTACT SURFACES.

Food-handling areas: Any area where food is stored, processed, prepared, or served.

Food preparation areas: Any area where food is processed, cooked, or prepared for service.

Food-processing plant: A commercial operation that manufactures, packages, labels, or stores food for human consumption and does not provide food directly to a CONSUMER.

Food service areas: Any area where food is presented to passengers or crew members (excluding individual cabin service).

Food storage areas: Any area where food or food products are stored.

Food transportation corridors: Areas primarily intended to move food during food preparation, storage, and service operations (e.g., service lift [elevator] vestibules to food preparation service and storage areas, provision corridors, and corridors connecting preparation areas and service areas). Corridors primarily intended to move only closed beverages and packaged foods (e.g., bottled/canned beverages, crackers, chips, etc.) are not considered food transportation corridors, but the deck/BULKHEAD juncture must be covered. **Excluded:**

- **Passenger and crew corridors, public areas, individual cabin service, and dining rooms connected to galleys.**
- **Food loading areas used solely for delivery of food to the vessel.**

Food waste system: A system used to collect, transport, and process food waste from FOOD AREAS to a waste disposal system (e.g., pulper, vacuum system).

Foodborne disease outbreak: An incident in which two or more persons experience a similar illness resulting from the ingestion of a common food.

Game animal: An animal, the products of which are food, that is not classified as

- Cattle, sheep, swine, goat, horse, mule, or other equine in 9 CFR Subchapter A - Mandatory MEAT Inspection, Part 301,
- POULTRY in 9 CFR Subchapter C - Mandatory POULTRY Products Inspection, Part 381, or
- FISH as defined under Subparagraph 1-201.10(B)(25).

Game animal includes mammals such as reindeer, elk, deer, antelope, water buffalo, bison, rabbit, squirrel, opossum, raccoon, nutria, or muskrat, and nonaquatic reptiles such as land snakes.

Game animal does not include RATITES such as ostrich, emu, and rhea.

Gap: An open juncture of more than 3 millimeters (1/8 inch).

General-use pesticide: A pesticide not classified by EPA for restricted use as specified in 40 CFR 152.175.

Grade A standards: Requirements of the FDA Grade A Pasteurized Milk Ordinance and Grade A Condensed and Dry Milk Ordinance with which certain fluid and dry milk and milk products comply.

Gravity drain: A drain fitting used to drain the body of water in a RECREATIONAL WATER FACILITY by gravity and with no pump downstream of the fitting.

Gravity drainage system: A water collection system whereby a collection tank is located between the RECREATIONAL WATER FACILITY and the suction pumps.

Gray water: Wastewater from galley EQUIPMENT and DECK DRAINS, dishwashers, showers and baths, laundries, washbasins, DECK DRAINS, and recirculated RECREATIONAL WATER FACILITIES. Gray water does not include BLACK WATER or bilge water from the machinery spaces.

Gutterway: See SCUPPER.

HACCP (Hazard Analysis Critical Control Point) plan: A written document that delineates the formal procedures for following the Hazard Analysis Critical Control Point principles developed by the National Advisory Committee on Microbiological Criteria for FOODS.

Halogen: The group of elements including chlorine, bromine, and iodine used for DISINFECTION of water.

Hand antiseptic: Antiseptic products applied to human skin.

Harbor: The portion of a port area set aside for vessel anchorage or for ports including wharves; piers; quays; and service areas, the boundaries are the high-water shore line; and others as determined by legal definition, citation of coordinates, or other means.

Hazard: A biological, chemical, or physical property that may cause an unacceptable CONSUMER health risk.

Heated (RWF): Any RECREATIONAL WATER FACILITY with a water temperature exceeding 32°C (90°F).

Health hazard: An impairment that creates an actual hazard to the public health through poisoning or through the spread of disease. For example, water quality that creates an actual hazard to the public health through the spread of disease by SEWAGE, industrial fluids, waste, etc. (e.g., sluice machine connection).

Hermetically sealed container: A container designed to be secure against the entry of microorganisms and, in the case of low-acid canned FOODS, to maintain the commercial sterility of its contents after processing.

Hose bib connection vacuum breaker (HVB): A BACKFLOW PREVENTION DEVICE that attaches directly to a hose bib by way of a threaded head. This device uses a single check valve and vacuum breaker vent. It is a form of an AVB specifically designed for a hose connection. A hose bib connection vacuum breaker is not APPROVED for use under CONTINUOUS PRESSURE (e.g., when a shut-off valve is located downstream from the device).

Immediate contact: Someone sharing a cabin either full-time or part-time or sharing a cabin's bathroom facilities. This includes boyfriends, girlfriends, spouses, and significant others.

Imminent health hazard: A significant threat or danger to health that is considered to exist when evidence is sufficient to show that a product, practice, circumstance, or event creates a situation that requires immediate correction or cessation of operation to prevent injury.

Injected meats: Manipulating MEAT so that infectious or toxigenic microorganisms may be introduced from its surface to its interior through tenderizing with deep penetration or injecting the MEAT such as with juices, which may be referred to as injecting, pinning, or stitch pumping. This does not include routine temperature monitoring.

Integrated pest management (IPM): A documented, organized system of controlling pests through a combination of methods including inspections, baits, traps, effective sanitation and maintenance, and judicious use of chemical compounds.

Interactive recreational water facility: An indoor or outdoor recreational water facility that includes misting, jetting, waterfalls, or sprinkling features that involve water recirculation systems that come into contact with bathers. Additional features or facilities, such as decorations or fountains, will designate the facility as an interactive RWF if there is any piping connected through the recirculation system. These facilities may be zero depth. Fully or partially enclosed water slides are considered interactive recreational water facilities.

Isolation: The separation of persons who have a specific infectious illness from those who are healthy and the restriction of ill persons' movement to stop the spread of that illness. **For VSP's purposes, isolation for passengers with AGE symptoms is advised and isolation for crew with AGE symptoms is required.**

Kitchenware: FOOD preparation and storage UTENSILS.

Law: Applicable local, state, federal, or other equivalent international statutes, regulations, and ordinances.

Linens: Fabric items such as cloth hampers, cloth napkins, tablecloths, wiping cloths, and work garments including cloth gloves.

Making way: Progressing through the water by mechanical or wind power.

Meat: The flesh of animals used as FOOD including the dressed flesh of cattle, swine, sheep, or goats and other edible animals, **except FISH, POULTRY, and wild GAME ANIMALS.**

Mechanically tenderized: Manipulating MEAT with deep penetration by processes that may be referred to as blade tenderizing; jaccarding; pinning; needling; or using blades, pins, needles, or any mechanical device. This does not include processes by which solutions are injected into MEAT.

mg/L: Milligrams per liter, the metric equivalent of parts per million (ppm).

Molluscan shellfish: Any edible species of fresh or frozen oysters, clams, mussels, and scallops or edible portions thereof, **except when the scallop product consists only of the shucked adductor muscle.**

Noncorroding: Material that maintains its original surface characteristics through prolonged influence by the use environment, FOOD contact, and normal use of cleaning compounds and sanitizing solutions.

Nonfood-contact surfaces (nonfood zone): All exposed surfaces, other than FOOD-CONTACT SURFACES, of EQUIPMENT located in FOOD AREAS (Figures 6a and 6b).

Outbreak: See AGE OUTBREAK.

Packaged: Bottled, canned, cartoned, securely bagged, or securely wrapped, whether packaged in a FOOD establishment or a FOOD-PROCESSING PLANT. **Packaged does not include a wrapper, carry-out box, or other nondurable container used to facilitate FOOD protection during service and receipt of FOOD by the CONSUMER.**

Permeate water: Water produced by a reverse osmosis unit.

Permeate water lines: Pipes carrying PERMEATE WATER from the reverse osmosis nit that may be directed to the POTABLE WATER SYSTEM. This is the VSP definition for pipe striping purposes.

Person in charge: The individual present on a vessel who is responsible for the FOOD operation at the time of inspection such as the FOOD and BEVERAGE Manager, FOOD Manager, or Chef.

Personal-care items: Items or substances that may be poisonous, toxic, or a source of CONTAMINATION and are used to maintain or enhance a person's health, hygiene, or appearance. **Personal-care items include items such as medicines, first-aid supplies, and cosmetics and toiletries (e.g., toothpaste, mouthwash).**

Pesticide: Any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest. For the purposes of this manual, pesticides are considered either general use or restricted use.

pH (potens hydrogen): The symbol for the negative logarithm of the hydrogen ion concentration, which is a measure of the degree of acidity or alkalinity of a solution. **Values between 0 and 7 indicate acidity and values between 7 and 14 indicate alkalinity. The value for pure distilled water is 7, which is neutral.**

Plumbing fixture: A receptacle or device that

- Is permanently or temporarily connected to the water-distribution system of the vessel and demands a supply of water from the system; or
- Discharges used water, waste materials, or SEWAGE directly or indirectly to the drainage system of the vessel.

Plumbing system: The water supply and distribution pipes; PLUMBING FIXTURES and traps; soil, waste, and vent pipes; sanitary sewer drains and vessel drains, including their respective connections, devices, and appurtenances within the vessel; and water-treating EQUIPMENT.

Poisonous or toxic materials: Substances not intended for ingestion. These substances are in four categories:

- Cleaners and SANITIZERS, which include cleaning and sanitizing agents and agents such as caustics, acids, drying agents, polishes, and other chemicals.
- PESTICIDES [except SANITIZERS] that include substances such as insecticides and rodenticides.
- Substances necessary for the operation and maintenance of the establishment such as nonfood-grade lubricants and PERSONAL-CARE ITEMS that may be deleterious to health.
- Substances not necessary for the operation and maintenance of the vessel and are on the vessel, such as petroleum products and paints.

Pollution: The presence of any foreign substance (organic, inorganic, radiologic, or biologic) that tends to degrade water quality to create a HEALTH HAZARD.

Portable: A description of EQUIPMENT that is READILY REMOVABLE or mounted on casters, gliders, or rollers; provided with a mechanical means so that it can be tilted safely for cleaning; or readily movable by one person.

Potable water: Water that is halogenated and pH controlled and is intended for

- Drinking, washing, bathing, or showering;
- Using in fresh water SWIMMING POOLS and WHIRLPOOL SPAS;
- Using in the vessel's hospital;
- Handling, preparing, or cooking FOOD; and

- Cleaning FOOD STORAGE and FOOD PREPARATION areas, UTENSILS, and EQUIPMENT.

Potable water is free from impurities in amounts sufficient to cause disease or harmful physiological effects. The water quality must conform to requirements of the World Health Organization DRINKING WATER standards.

Potable water tanks: All tanks in which POTABLE WATER is stored.

Potentially hazardous food (PHF) (or time/temperature control for safety food [TCS]): Natural or synthetic food that requires time/temperature control because it is in a form capable of supporting one of the following:

- Rapid and progressive growth of infectious or toxigenic microorganisms.
- Growth and toxin production of *Clostridium botulinum*.
- Growth of *Salmonella enteritidis* [in raw shell eggs].

PHF includes an animal FOOD (a FOOD of animal origin) that is raw or heat-treated; a FOOD of plant origin that is heat-treated or consists of raw seed sprouts; cut melons; CUT LEAFY GREENS; cut tomatoes or mixtures of cut tomatoes; and garlic and oil mixtures that are not acidified or otherwise modified at a FOOD-PROCESSING PLANT in a way that results in mixtures that do not support growth as specified under subparagraph (a) of this definition or any FOOD classified by the FDA as a PHF/TCS.

PHF does not include the following:

- An air-cooled hard-boiled egg with shell intact, or a shell egg that is not hard-boiled, but has been treated to destroy all viable Salmonellae.**
- A FOOD with an Aw value of 0.85 or less.**
- A FOOD with a pH level of 4.6 or below when measured at 24°C (75°F).**
- A FOOD in an unopened HERMETICALLY SEALED CONTAINER that is commercially processed to achieve and maintain commercial sterility under conditions of nonrefrigerated storage and distribution.**
- A FOOD for which laboratory evidence demonstrates that the rapid and progressive growth of infectious or toxigenic microorganisms or the growth of *S. enteritidis* in eggs or *C. botulinum* cannot occur, such as a FOOD that has an Aw and a pH above the levels specified under subparagraphs (b) and (c) of this definition and that may contain a preservative, other barrier to the growth of microorganisms, or a combination of barriers that inhibit the growth of microorganisms.**

- f. **A FOOD that may contain an infectious or toxigenic microorganism or chemical or physical contaminant at a level sufficient to cause illness, but that does not support the growth of microorganisms as specified under subparagraph (a) of this definition.**

Poultry:

- Any domesticated bird such as chicken, turkey, duck, goose, or guinea, whether live or dead, as defined in 9 CFR 381 Poultry Products Inspection Regulations.
- Any migratory waterfowl, game bird, or squab such as pheasant, partridge, quail, grouse, or guinea, whether live or dead, as defined in 9 CFR 362 Voluntary Poultry Inspection Program.

Poultry does not include RATITE.

Pressure vacuum breaker assembly (PVB): A device consisting of an independently loaded internal check valve and a spring-loaded air inlet valve. This device is also equipped with two resilient seated gate valves and test cocks.

Primal cut: A basic major cut into which carcasses and sides of MEAT are separated, such as a beef round, pork loin, lamb flank, or veal breast.

Quarantine: The limitation of movement of apparently well persons who have been exposed to a case of communicable (infectious) disease during its period of communicability to prevent disease TRANSMISSION during the incubation period if infection should occur.

Ratite: A flightless bird such as an emu, ostrich, or rhea.

Readily accessible: Exposed or capable of being exposed for cleaning or inspection without the use of tools.

Readily removable: Capable of being detached from the main unit without the use of tools.

Ready-to-eat (RTE) food: Food in a form that is edible without washing, cooking, or additional preparation by the food establishment or the CONSUMER and is reasonably expected to be consumed in that form.

RTE food includes

- **POTENTIALLY HAZARDOUS FOOD that is unpackaged and cooked to the temperature and time required for the specific food.**
- **Raw, washed, cut fruits and vegetables.**
- **Whole, raw fruits and vegetables presented for consumption without the need for further washing, such as at a buffet.**

- **Other food presented for consumption for which further washing or cooking is not required and from which rinds, peels, husks, or shells are removed.**
- **Fruits and vegetables cooked for hot holding, as specified under section 7.3.4.1.3.**
- **Substances derived from plants such as spices, seasonings, and sugar.**
- **A bakery item such as bread, cakes, pies, fillings, or icing for which further cooking is not required for food safety.**
- **Products produced in accordance with USDA guidelines and that have received a lethality treatment for pathogens: dry, fermented sausages, such as dry salami or pepperoni; salt-cured MEAT and POULTRY products, such as prosciutto ham, country cured ham, and Parma ham; and dried MEAT and POULTRY products, such as jerky or beef sticks.**
- **Foods manufactured as specified in 21 CFR Part 113, Thermally Processed Low-Acid Foods PACKAGED in HERMETICALLY SEALED CONTAINERS.**

Recreational water facility (RWF): A water facility that has been modified, improved, constructed, or installed for the purpose of public swimming or recreational bathing. RWFs include, but are not limited to,

- ACTIVITY POOLS.
- BABY-ONLY WATER FACILITIES.
- CHILDREN'S POOLS.
- Diving pools.
- Hot tubs.
- Hydrotherapy pools.
- INTERACTIVE RECREATIONAL WATER FACILITIES.
- Slides.
- SPA POOLS.
- SWIMMING POOLS.
- Therapeutic pools.
- WADING POOLS.
- WHIRLPOOLS.

Recreational seawater: Seawater taken onboard while MAKING WAY at a position at least 12 miles at sea and routed directly to the RWFs for either sea-to-sea exchange or recirculation.

Reduced pressure principle backflow prevention assembly (RP assembly): An assembly containing two independently acting internally loaded check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit must include properly located resilient seated test cocks and tightly closing resilient seated shutoff valves at each end of

the assembly.

Refuse: Solid waste not carried by water through the SEWAGE system.

Registered design professional: An individual registered or licensed to practice his or her respective design profession as defined by the statutory requirements of the professional registration LAWS of the state or jurisdiction in which the project is to be constructed (per ASME A112.19.8-2007).

Regulatory authority: Local, state, or federal or equivalent international enforcement body or authorized representative having jurisdiction over FOOD processing, transportation, or warehousing or other FOOD establishment.

Removable: Capable of being detached from the main unit with the use of simple tools such as a screwdriver, pliers, or an open-end wrench.

Reportable AGE case (VSP definition): A case of AGE with one of the following characteristics:

- Diarrhea (three or more episodes of loose stools in a 24-hour period or what is above normal for the individual, e.g., individuals with underlying medical conditions) **OR**
- Vomiting and one additional symptom including one or more episodes of loose stools in a 24-hour period, or abdominal cramps, or headache, or muscle aches, or fever (temperature of $\geq 38^{\circ}\text{C}$ [100.4°F]); **AND**
- Reported to the master of the vessel, the medical staff, or other designated staff by a passenger or a crew member.

Nausea, although a common symptom of AGE, is specifically excluded from this definition to avoid misclassifying seasickness (nausea and vomiting) as ACUTE GASTROENTERITIS.

Restricted-use pesticide: A pesticide product that contains the active ingredients specified in 40 CFR 152.175 Pesticides classified for restricted use and is limited to use by or under the direct supervision of a certified applicator.

Safety vacuum release system (SVRS): A system capable of releasing a vacuum at a suction outlet caused by a high vacuum due to a blockage in the outlet flow. These systems shall be designed and certified in accordance with ASTM F2387-04 or ANSI/ASME A 112.19.17-2002.

Sanitizer: Chemical or physical agents that reduce microorganism CONTAMINATION levels present on inanimate environmental surfaces.

Two classes of sanitizers:

- **Sanitizers of NONFOOD-CONTACT SURFACES: The performance standard used by the U.S. Environmental Protection Agency (EPA)**

for these sanitizers requires a reduction of the target microorganism by 99.9% or 3 logs (1000, 1/1000, or 10³) after 5 minutes of contact time.

- **Sanitizers of FOOD-CONTACT SURFACES: The EPA performance standard for these sanitizers requires a 99.999% or 5-log reduction of the target microorganism in 30 seconds.**

Sanitization: The application of cumulative heat or chemicals on cleaned FOOD-CONTACT and NONFOOD-CONTACT SURFACES that, when evaluated for efficacy, provides a sufficient reduction of pathogens.

Scupper: A conduit or collection basin that channels liquid runoff to a DECK DRAIN.

Sealant: Material used to fill SEAMS.

Seam: An open juncture greater than 0.8 millimeters (1/32 inch) but less than 3 millimeters (1/8 inch).

Sewage: Liquid waste containing animal or vegetable matter in suspension or solution and may include liquids containing chemicals in solution.

Shellstock: Raw, in-shell MOLLUSCAN SHELLFISH.

Shucked shellfish: MOLLUSCAN SHELLFISH with one or both shells removed.

Single-service articles: TABLEWARE, carry-out UTENSILS, and other items such as bags, containers, placemats, stirrers, straws, toothpicks, and wrappers designed and constructed for one-time, one-person use.

Single-use articles: UTENSILS and bulk FOOD containers designed and constructed to be used once and discarded. **Single-use articles include items such as wax paper, butcher paper, plastic wrap, formed aluminum FOOD containers, jars, plastic tubs or buckets, bread wrappers, pickle barrels, ketchup bottles, and number 10 cans that do not meet materials, durability, strength, and cleanability specifications.**

Slacking: Process of moderating the temperature of a FOOD such as allowing a FOOD to gradually increase from a temperature of -23°C (-10°F) to -4°C (25°F) in preparation for deep-fat frying or to facilitate even heat penetration during the cooking of previously block-frozen FOOD such as spinach.

Smooth:

- A FOOD-CONTACT SURFACE having a surface free of pits and inclusions with a cleanability equal to or exceeding that of (100-grit)

number 3 stainless steel.

- A NONFOOD-CONTACT SURFACE of EQUIPMENT having a surface equal to that of commercial grade hot-rolled steel free of visible scale.
- Deck, BULKHEAD, or DECKHEAD that has an even or level surface with no roughness or projections to make it difficult to clean.

Spa pool: A POTABLE WATER or saltwater-supplied pool with temperatures and turbulence comparable to a WHIRLPOOL SPA.

- Depth of more than 1 meter (3 feet) and
- Tub volume of more than 6 tons of water.

Spill-resistant vacuum breaker (SVB): A specific modification to a PRESSURE VACUUM BREAKER ASSEMBLY to minimize water spillage.

Spray pad: Play and water contact area designed to have no standing water.

Suction fitting: A fitting in a RECREATIONAL WATER FACILITY under direct suction through which water is drawn by a pump.

Swimming pool: A RECREATIONAL WATER FACILITY greater than 1 meter in depth. This does not include SPA POOLS that meet this depth.

Table-mounted equipment: EQUIPMENT that is not PORTABLE and is designed to be mounted off the floor on a table, counter, or shelf.

Tableware: Eating, drinking, and serving UTENSILS for table use such as flatware including forks, knives, and spoons; hollowware including bowls, cups, serving dishes, and tumblers; and plates.

Technical water: Water that has not been chlorinated or pH controlled on board the vessel and that originates from a bunkering or condensate collection process, or seawater processed through the evaporators or reverse osmosis plant and is intended for storage and use in the technical water system.

Temperature-measuring device (TMD): A thermometer, thermocouple, thermistor, or other device that indicates the temperature of FOOD, air, or water and is numerically scaled in Celsius and/or Fahrenheit.

Time/temperature control for safety food (TCS): See POTENTIALLY HAZARDOUS FOOD (PHF).

Transmission (of infection): Any mechanism by which an infectious agent is spread from a source or reservoir to another person. These mechanisms are defined as follows:

- Direct transmission (includes person-to-person transmission): Direct and essentially immediate transfer of infectious agents to a receptive portal of

entry through which human or animal infection may take place.

- **Indirect transmission:** When an infectious agent is transferred or carried by some intermediate item, organism, means, or process to a susceptible host, resulting in disease. This includes airborne, foodborne, waterborne, vehicleborne (e.g., fomites), and vectorborne modes of transmission.

Turnover: The circulation, through the recirculation system, of a quantity of water equal to the pool volume.

Unblockable drain/suction fitting: A drain or SUCTION FITTING in a RECREATIONAL WATER FACILITY that cannot be completely covered or blocked by a 457 millimeters x 584 millimeters (18 inches x 23 inches) body-blocking element and that is rated by the test procedures or by the appropriate calculation in accordance with ASME A112.19.8M.

Utensil: A FOOD-contact implement or container used in storing, preparing, transporting, dispensing, selling, or serving FOOD. Examples: multiuse, SINGLE-SERVICE, or SINGLE-USE KITCHENWARE or TABLEWARE; gloves used in contact with FOOD; FOOD TEMPERATURE-MEASURING DEVICES; and probe-type price or identification tags used in contact with FOOD.

Utility sink: Any sink located in FOOD SERVICE AREAS not intended for handwashing and/or WAREWASHING.

Variance: A written document issued by VSP that authorizes a modification or waiver of one or more requirements of these guidelines if, in the opinion of VSP, a HEALTH HAZARD or nuisance will not result from the modification or waiver.

Wading pool: RECREATIONAL WATER FACILITY with a maximum depth of less than 1 meter.

Warewashing: The cleaning and sanitizing of TABLEWARE, UTENSILS, and FOOD-CONTACT SURFACES of EQUIPMENT.

Waterborne outbreak: An OUTBREAK involving at least two people who experience a similar illness after ingesting or using water intended for drinking or after being exposed to or unintentionally ingesting or inhaling fresh or marine water used for recreational purposes and epidemiological evidence implicates the water as the source of illness. A single case of chemical poisoning or a laboratory-confirmed case of primary amebic meningoencephalitis is considered an OUTBREAK.

Whirlpool spa: A freshwater or seawater pool equipped with either water or air jets and designed to operate at a minimum temperature of 32°C (90°F) and a

maximum temperature of 40°C (104°F).

Whole-muscle, intact beef: Whole-muscle beef that is not injected, MECHANICALLY TENDERIZED, reconstructed, or scored and marinated; and from which beef steaks may be cut.

3.3 Acronyms

AGE	ACUTE GASTROENTERITIS
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
C	Celsius
CDC	Centers for Disease Control and Prevention
CFR	CODE OF FEDERAL REGULATIONS
CIP	CLEAN IN PLACE
CT VALUE	CONTACT TIME VALUE
DGMQ	Division of Global Migration and Quarantine
<i>E. coli</i>	<i>Escherichia coli</i>
EHO	Environmental Health Officer
EPA	U.S. Environmental Protection Agency
F	Fahrenheit
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FDA	U.S. FOOD and Drug Administration
HACCP	HAZARD ANALYSIS AND CRITICAL CONTROL POINTS
HVAC	heating, ventilation, and air conditioning
IATA	International Air Transport Association
IHR	International Health Regulations
IPM	INTEGRATED PEST MANAGEMENT
IPS	iron pipe size
ISO	International Standards Organization
MSDS	material safety data sheets
MG/L	MILLIGRAMS PER LITER
mV	millivolt
NCEH	National Center for Environmental Health
NSF International	National Sanitation Foundation International
OPRP	OUTBREAK Prevention and Response Plan
ORP	oxidation reduction potential
pH	POTENS HYDROGEN
PHF	POTENTIALLY HAZARDOUS FOOD
PHS	U.S. Public Health Service (also USPHS)
ppm	parts per million
RP ASSEMBLY	REDUCED PRESSURE PRINCIPLE BACKFLOW

RO	PREVENTION ASSEMBLY
RTE	reverse osmosis
RWF	READY TO EAT
USC	RECREATIONAL WATER FACILITY
USDA	United States Code
USPHS	U.S. Department of Agriculture
UV	U.S. Public Health Service
VSP	ultraviolet light
WHO	Vessel Sanitation Program
	World Health Organization

4.0 Acute Gastroenteritis (AGE) Surveillance

This section includes the following subsections:

- 4.1 Data Collection
- 4.2 Notification
- 4.3 Clinical Specimens
- 4.4 Requirements for Isolating Symptomatic and Primary Contacts of Crew and Passengers with AGE
- 4.5 Knowledge

References for 4.0 Acute Gastroenteritis (AGE) Surveillance can be found in Annex 14.4.

4.1 Data Collection

4.1.1 Reportable Cases

4.1.1.1 Definition

4.1.1.1.1 Reportable Case Definition (02)

A REPORTABLE case of AGE is only a case reported to the master of the vessel, the medical staff, or other designated staff by a passenger or a crew member and meets the definition below.

A case is defined as

- Diarrhea (three or more episodes of loose stools in a 24-hour period or what is above normal for the individual. See section 4.1.2.1.3, illness symptoms); OR
- Vomiting and one additional symptom including one or more episodes of loose stools in a 24-hour period, or abdominal cramps, or headache, or muscle aches, or fever (temperature of $\geq 38^{\circ}\text{C}$ [100.4°F]).

Nausea, although a common symptom of AGE, is specifically excluded from this definition to avoid misclassifying seasickness (nausea and vomiting) as AGE.

4.1.1.2 Onset Time (02)

The REPORTABLE AGE CASES must include crew members with a symptom onset time of up to 3 days before boarding the vessel. Maintain documentation of the 3-day assessment for each crew member with symptoms on the vessel for review during inspections. Retain this documentation for 12 months.

4.1.1.3 Definition Purpose

Use these case definitions for identifying and classifying cases for reporting purposes. These case definitions should not be used as criteria for clinical intervention or public health action. For many conditions of public health importance, action to contain disease should be initiated as soon as a problem is identified; in many circumstances, appropriate public health action should be undertaken even though insufficient information is available to determine whether cases meet the case definition.

4.1.1.4 Foreign Quarantine Regulations

U.S. foreign QUARANTINE regulations (42 CFR Part 71) require ships to immediately report on-board deaths and certain communicable illnesses to CDC's Division of Global Migration and QUARANTINE (DGMQ). These reports should be made to the CDC QUARANTINE Station with jurisdiction over the ship's next port of entry

www.cdc.gov/quarantine/quarantinestationcontactlistfull.html).

Reporting requirements for ill passengers or crew are posted at www.cdc.gov/quarantine/maritime/federal-regulations-reporting-illness-death-ships-destined-united-states.html.

The preferred method of reporting illnesses and deaths to DGMQ is electronically via the Maritime Illness and Death Reporting PDF Form. If there are issues with the PDF form, ships can email, call, or fax the report to the CDC QUARANTINE Station with jurisdiction over the ship's next U.S. port of entry

www.cdc.gov/quarantine/quarantinestationcontactlistfull.html).

For significant events or emergencies, ships should notify the appropriate CDC QUARANTINE Station by telephone. If the QUARANTINE station cannot be contacted immediately, please call the CDC Emergency Operations Center at 770-488-7100.

General inquiries and information about QUARANTINE regulations:

Centers for Disease Control and Prevention
Division of Global Migration and QUARANTINE
Roybal Campus
1600 Clifton Road - MS E28
Atlanta, GA 30329-4027
Website: www.cdc.gov/quarantine/maritime/index.html
Email: MaritimeAdmin@cdc.gov (Monday–Friday 08:00–16:00 Eastern)

4.1.2 Records

4.1.2.1 Log

4.1.2.1.1 **Responsibility (02)**

A standardized AGE surveillance log for each cruise must be maintained daily by the master of the vessel, the medical staff, or other designated staff.

4.1.2.1.2 **Required Information (02)**

The AGE surveillance log must list

- The name of the vessel, cruise dates, and cruise number.
- All REPORTABLE CASES of AGE.
- All passengers and crew members who are dispensed antidiarrheal medication from the master of the vessel, medical staff, or other designated staff.

4.1.2.1.3 **Log Details (02)**

The AGE surveillance log must include a header containing the following information about the voyage:

- Vessel name.
- Voyage number.
- Date from.
- Date to.
- Total number of passengers.*
- Reportable total number of passengers ill.
- Total number of crew.*
- Reportable total number of crew ill.

*Total number of passengers and total number of crew must be the totals at the beginning of the voyage (i.e., totals on “date from”).

The AGE surveillance log entry for each passenger or crew member must contain the following information in separate columns:

- Patient I.D.
- Date of the first medical visit or report to staff of illness.
- Time of the first medical visit or report to staff of illness.
- Person’s last name.
- Person’s first name.
- Person’s age.
- Person’s sex.
- Designation as passenger or crew member.
- Cabin number.
- Crew member position or job on the vessel, if applicable.

- DATE OF ILLNESS ONSET.
- TIME OF ILLNESS ONSET.
- Illness symptoms, including the presence or absence of the following selected signs and symptoms, with a separate column for each of the following:
 - Number of episodes of diarrhea in a 24-hour period.
 - Bloody stools (yes/no).
 - Number of episodes of vomiting in a 24-hour period.
 - Fever (yes/no).
 - Recorded temperature.
 - Abdominal cramps (yes/no).
 - Headaches (yes/no).
 - Myalgia (yes/no).
 - Date of last symptom.
 - Time of last symptom.
 - Entry (yes/no) for whether a specimen was requested.
 - Entry (yes/no) for whether a specimen was received.
 - Entry (yes/no) for antidiarrheal medications sold or dispensed by designated medical staff.
 - Entry (yes/no) for whether this was a REPORTABLE CASE.
 - Presence of underlying medical conditions that may affect interpretation of AGE; for example, diabetic diarrhea, inflammatory bowel disease, gastrectomy, antibiotic-induced diarrhea, vomiting from chemotherapy, ear infections in children or others. If none, write “none,” “not applicable,” “N/A,” or similar wording. **Comments may also be added to the log in this column after the information about underlying illness.**

The AGE surveillance log must contain the above information in this exact order and entered in the template in Annex 13.2.2. The log data must be exported in the exact order as in the example template in Annex 13.2.2 with analyzable formats such as Microsoft Excel or Microsoft Access. Any additional data fields must be entered only outside of the form margins exported to VSP.

4.1.2.1.4 Medications Sold or Dispensed (02)

Antidiarrheal medications must not be sold or dispensed to passengers or crew except by designated medical staff.

4.1.2.2 Questionnaires

4.1.2.2.1 Food/Beverage Questionnaire (02)

Questionnaires detailing activities and meal locations for the 72 hours before illness onset must be distributed to all passengers and crew members who are identified as REPORTABLE CASES. At a minimum, self-administered questionnaires must contain the following data elements:

- Vessel name.
- Voyage number.
- Person's name.
- Person's age.
- Person's sex.
- Designation as a passenger or crew member.
- Cabin number.
- Total number in cabin.
- Meal seating information (seating and table number).
- DATE AND TIME OF ILLNESS ONSET.
- Other people with the same symptoms.
- Travel and boarding information prior to joining the vessel.
- Tour group information, if applicable.
- Ports went ashore prior to illness onset.
- Excursions attended.
- FOOD and BEVERAGE consumption while ashore, including drinks with ice.
- Meals and activities aboard the vessel for 72 hours before illness (breakfast, lunch, dinner, snacks).
- Activities attended onboard.

An example questionnaire template containing all of the required data elements can be found in Annex 13.2.2.

To assist passengers and crew members with filling out the self-administered questionnaires, the following information for the most current cruise may be maintained at the medical center:

- **Menus, FOOD, and drink selections available at each venue on the vessel, from room service, and on private islands.**
- **Menus, FOOD, and drink selections available for each vessel-sponsored excursion.**
- **Organized activities on the vessel or private islands.**
- **Cruise line sponsored pre-embarkation activities.**

To assist memory recall for guests and crew completing the 72-hour self-administered questionnaire, an electronic listing of

the above information on an interactive system available via an onboard video system can be substituted for the package in the medical center.

4.1.2.3 Retention

4.1.2.3.1 Retention and Review (02)

The following records must be maintained on board for 12 months and available for review by VSP during inspections and OUTBREAK investigations:

- Medical log/record.
- AGE surveillance log.
- 72-hour self-administered questionnaires.
- Interviews with cabin mates and IMMEDIATE CONTACTS of crew members with AGE (initial, 24-, and 48-hour).
- Documentation of the 3-day assessment of crew members **with AGE** symptoms before joining the vessel.
- Documentation of the date and time of last symptom and clearance to return to work for FOOD and nonfood EMPLOYEES.
- Documentation of the date and time of verbal interviews with asymptomatic cabin mates and IMMEDIATE CONTACTS of symptomatic crew.

Electronic records of these documents are acceptable as long as the data are complete and can be retrieved during inspections and OUTBREAK investigations.

4.1.2.4 Confidentiality

4.1.2.4.1 Privacy

All personal medical information received by CDC personnel must be protected in accordance with applicable federal LAW, including

- 5 U.S.C. Section 552a. Privacy Act - Records maintained on individuals and
- Freedom of Information Act 5 U.S.C. Section 552. Administrative Procedure - Public information; agency rules, opinions, orders, records, and proceedings.

4.2 Notification

4.2.1 Routine Report

4.2.1.1 Routine Report Timing

4.2.1.1.1 24-Hour Report (01 C)

The master, medical staff, or other designated staff of a vessel destined for a U.S. port from a foreign port must submit at least one standardized AGE report based on the number of REPORTABLE CASES in the AGE log to VSP no less than 24 hours—but not more than 36 hours—before the vessel's expected arrival at the U.S. port.

4.2.1.1.2 4-Hour Update Report (01 C)

If the number of cases changes after submission of the initial report, an updated report must be submitted no less than 4 hours before the vessel's arrival at the U.S. port. The 4-hour update report must be a cumulative total count of the reported crew and passengers during the entire cruise, including the additional cases.

If there is an update to the AGE surveillance log after the 4-hour report is submitted, an additional 4-hour report must be submitted only if the vessel is still more than 4 hours from arrival in the U.S. port.

If the vessel is less than 4 hours from arrival in the U.S. port, no additional 4-hour report is needed.

4.2.1.1.3 Report Submission (02)

Submit routine 24-hour and 4-hour update reports electronically. **In lieu of electronic notification, the reports may be submitted by telephone or fax.** The vessel must maintain proof onboard that the report was successfully received by VSP.

4.2.1.2 Report Contents

4.2.1.2.1 Contents (01 C)

The AGE report must contain the following:

- Name of the vessel.
- Port of embarkation.
- Date of embarkation.
- Port of disembarkation.
- Date of disembarkation.
- Total numbers of REPORTABLE CASES of AGE among passengers, including those who have disembarked because

- of illness—even if the number is 0 (zero reporting).
- Total numbers of REPORTABLE CASES of AGE among crew members, including those who have disembarked because of illness—even if the number is 0 (zero reporting).
- Total number of passengers and crew members on the cruise.

4.2.1.2.2 **Cruise Length**

For cruises lasting longer than 15 days before entering a U.S. port, the AGE report may include only those REPORTABLE CASES and total numbers of passengers and crew members for the 15 days before the expected arrival at a U.S. port.

4.2.2 Special Report

4.2.2.1 Special Report Timing

4.2.2.1.1 **2% and 3% Illness Report (01 C)**

The master or designated corporate representative of a vessel with an international itinerary destined for a U.S. port must submit a special report at any time during a cruise, including between two U.S. ports,

- When the cumulative percentage of REPORTABLE CASES **for the entire voyage** entered in the AGE surveillance log reaches 2% among passengers or 2% among crew AND
- The vessel is within 15 days of expected arrival at a U.S. port.

For segmented voyages where those segments are 8 days or less, a special AGE report must be made to VSP

- **When a cumulative percentage of REPORTABLE CASES of either 2% or 3% is reached among passengers or crew within one segment or two consecutive segments AND**
- **The vessel is within 15 days of expected arrival at a U.S. port.**

The AGE surveillance log must include all segments from the start of the voyage, unless 67% (two-thirds) or more of the passengers are disembarked in any one segment.

For cruises lasting longer than 15 days before entering a U.S. port, the 2% or 3% special AGE report must include all cases for the entire voyage.

A telephone notification to VSP must accompany the special 2% report.

A second special report must be submitted when the cumulative percentage of REPORTABLE CASES entered in the AGE surveillance log reaches 3% among passengers or 3% among crew and the vessel is within 15 days of expected arrival at a U.S. port.

4.2.2.1.2 *Daily Updates (01)*

Daily updates of illness status must be submitted as requested by VSP after the initial submission of a special report. **Daily updates may be submitted electronically, by telephone, by fax, by email, or as requested by VSP.**

4.2.2.1.3 *Routine Reporting Continues (01)*

Routine reports (24-hour and 4-hour) must continue to be submitted by the master or designated corporate representative of a vessel that has submitted a special report.

4.2.3 Report Retention

4.2.3.1 Retention

4.2.3.1.1 *Retention (02)*

The 24-hour, 4-hour, and special reports must be maintained on the vessel for 12 months.

4.2.3.1.2 *Review (02)*

The reports must be available for review by VSP during inspections and OUTBREAK investigations.

4.3 Clinical Specimens

4.3.1 Clinical Specimen Submission

See Annex 13.4 for a list of recommended specimen collection supplies.

4.3.1.1 Specimen/Shipping Containers (02)

The medical staff will be responsible for maintaining a supply of at least 10 clinical specimen collection containers for both viral and bacterial agents (10 for each), as well as a shipping container that meets the latest shipping requirements of the International Air Transport Association (IATA) and U.S. Department of Transportation for Biological Substances, Category B designated shipments (or higher).

The vessel must maintain the appropriate labels and markings required for shipping Biological Substances, Category B shipments. The vessel must

maintain appropriate refrigerant materials to keep clinical specimens cool. For guidance, see Annex 13.4 of this manual.

4.3.2 Clinical Specimen Submission Collection Procedures

4.3.2.1 When to Collect (02)

When a vessel reaches 2% REPORTABLE AGE in either passengers or crew members, the medical staff will begin collecting clinical specimens (stool or vomitus specimens) for bacterial and/or viral analysis. If the etiologic agent is suspected to be parasitic, the medical staff should consult with VSP epidemiology staff for clinical specimen collection requirements.

Specimens should be requested before issuing antibiotic medications, but this patient treatment should not be contingent on specimen collection.

Specimens collected after administration of antibiotic medications must not be submitted for CDC analysis unless directed by VSP.

4.3.2.2 Proper Packing (02)

Before the specimens are PACKAGED and shipped for laboratory testing, VSP will give instructions to vessel/cruise line medical staff about the specific container (i.e., bacterial or viral) for transport to a laboratory.

All clinical specimens must be packed and shipped in accordance with the guidelines outlined in Annex 13.4. The specimen packaging must include the proper documentation as required by the receiving laboratory.

4.4 Requirements for Isolating Symptomatic and Primary Contacts of Crew and Passengers with Gastroenteritis

4.4.1 Crew, Staff, Officers, and Other Employees

4.4.1.1 Isolate Ill Crew

4.4.1.1.1 Symptomatic and Meeting the Case Definition for Acute Gastroenteritis (AGE) (11 C)

FOOD EMPLOYEES:

- Isolate in cabin or designated restricted area until symptom-free for a minimum of 48 hours.
- Follow-up with and receive approval by designated medical personnel before returning crew to work.

- Document date and time of last symptom and clearance to return to work.

The FOOD EMPLOYEE's supervisor or PERSON IN CHARGE must conduct an assessment of FOOD prepared or served by the FOOD EMPLOYEE while symptomatic and take appropriate corrective actions.

Corrective actions taken as a result of the assessment must be documented. Records must be maintained for 1 year and available for review during inspections.

- Review [when possible] any AGE CASES among passengers or crew reported after the ill FOOD EMPLOYEE's symptom onset for epidemiologic link/connection.

Appropriate corrective actions could include discarding READY-TO-EAT FOOD, thoroughly cooking raw FOOD, and disinfecting the FOOD AREA and EQUIPMENT.

Nonfood employees:

- ISOLATION in cabin or designated restricted area until symptom-free for a minimum of 24 hours.
- Follow-up with and receive approval by designated medical personnel before returning crew to work.
- Document the date and time of last symptom and clearance to return to work.

4.4.1.1.2 Hygiene and Handwashing Facts (02)

Advise symptomatic crew of hygiene and handwashing facts and provide written handwashing and hygiene fact sheets.

4.4.1.2 Cabin Mates/Contacts (02)

4.4.1.2.1 Asymptomatic Cabin Mates or Immediate Contacts of Symptomatic Crew

FOOD and nonfood employees:

- Restrict exposure to symptomatic crew member(s).
- Undergo a verbal interview with medical or supervisory staff, who will confirm their condition, provide facts and a written fact sheet about hygiene and handwashing, and instruct them to report immediately to medical if they develop illness symptoms.
- Complete a verbal interview daily with medical or supervisory staff until 48 hours after the ill crew members'

symptoms began. The first verbal interview must be conducted within 8 hours from the time the ill crew member initially reported to the medical staff. If the asymptomatic IMMEDIATE CONTACT or cabin mate is at work, he or she must be contacted by medical or supervisory staff as soon as possible. The date and time of verbal interviews must be documented.

An IMMEDIATE CONTACT is someone sharing a cabin either full-time or part-time or sharing a cabin's bathroom facilities. This includes boyfriends, girlfriends, spouses, and significant others.

If the symptomatic crew member has no cabin mate or other IMMEDIATE CONTACT, this must be documented.

4.4.2 Passengers

4.4.2.1 Isolate Ill Passengers (11 C)

Advise symptomatic passengers and those meeting the case definition to remain isolated in their cabins until well for a minimum of 24 hours after symptom resolution.

Follow-up by infirmary personnel is advised.

4.4.2.2 Hygiene and Handwashing Facts (02)

Advise symptomatic passengers of hygiene and handwashing facts and provide written handwashing and hygiene fact sheets.

4.5 Acute Gastroenteritis Surveillance Knowledge

4.5.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of medical operations related to AGE on the vessel must demonstrate to VSP—on request during inspections—knowledge of medical operations related to AGE.

The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector's questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of medical operations related to AGE on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

5.0 Potable Water

This section includes the following subsections:

- 5.1 Source
- 5.2 Bunker and Production Halogenation and pH Control
- 5.3 POTABLE WATER System
- 5.4 POTABLE WATER System Chemical Treatment
- 5.5 POTABLE WATER System HALOGEN Monitoring
- 5.6 Microbiologic Monitoring
- 5.7 Water Distribution System Protection
- 5.8 Knowledge

References for 5.0 Potable Water can be found in Annex 14.5.

5.1 Source

5.1.1 Bunkering

5.1.1.1 Standards

5.1.1.1.1 **Safe Source (03 C)**

DRINKING WATER bunkered from shore supplies must be from a potable source that meets World Health Organization standards for POTABLE WATER.

5.1.1.2 Microbiologic Sample Reports

5.1.1.2.1 **Water Report (06)**

Where available, the vessel must have a copy of the most recent microbiologic report from each port before bunkering POTABLE WATER to verify that the water meets potable standards. The date of the analysis report must be 30 days or less from the date of POTABLE WATER bunkering and must include an analysis for *Escherichia coli* at a minimum.

5.1.1.2.2 **Onboard Test (06)**

Water samples collected and analyzed by the vessel for the presence of *E. coli* may be substituted for the microbiologic report from each port water system. Samples must be analyzed using a method accepted in Standard Methods for the Examination of Water and Wastewater or international Environmental Protection Agency (EPA) APPROVED equivalent. Test kits, incubators, and associated EQUIPMENT must be operated and maintained in accordance with the manufacturers' specifications. If a vessel bunkers POTABLE WATER from the same port more

than once per month, only one test per month is required.

5.1.1.2.3 Review (06)

These records must be maintained on the vessel for 12 months and must be available for review during inspections.

5.1.2 Water Production

5.1.2.1 Location

5.1.2.1.1 Polluted Harbors (03 C)

A reverse osmosis unit, distillation plant, or other process that supplies water to the vessel's POTABLE WATER system must only operate while the vessel is MAKING WAY. These processes must not operate in polluted areas, HARBORS, or at anchor.

5.1.2.1.2 Technical Water

A reverse osmosis unit or evaporator with a completely separate plant/process, piping system, and connections from the POTABLE WATER system may be used to produce TECHNICAL WATER while in polluted areas, HARBORS, at anchor, or while not MAKING WAY.

5.1.2.1.3 Onboard Water Sources

Onboard water sources such as TECHNICAL WATER, air conditioning condensate, or wastewater of any kind (treated or untreated) are not allowed for POTABLE WATER production.

5.2 Bunkering and Production Halogenation and pH Control

5.2.1 Procedures

5.2.1.1 Residual Halogen and pH

5.2.1.1.1 Halogen and pH Level (03 C)

POTABLE WATER must be continuously halogenated to at least 2.0 MG/L (ppm) free residual HALOGEN at the time of bunkering or production with an automatic halogenation device. Adjust the pH so it does not exceed 7.8.

The amount of HALOGEN injected during bunkering or production must be controlled by a flow meter or a free HALOGEN analyzer.

5.2.1.1.2 Within 30 Minutes (08)

The free HALOGEN residual level must be adjusted to at least 2.0 MG/L (ppm) and the pH adjusted not to exceed 7.8 within 30 minutes of the start of the bunkering and production processes.

5.2.1.2 Monitoring

5.2.1.2.1 Bunkering Pretest (08)

A free HALOGEN residual and pH test must be conducted on the shore-side water supply before starting the POTABLE WATER bunkering process to establish the correct HALOGEN dosage.

The results of the pretest must be recorded and available for review during inspections.

5.2.1.2.2 Bunkering/Production Test (08)

After the free residual HALOGEN level of at least 2.0 MG/L (ppm) and pH level not exceeding 7.8 have been reached, the free residual HALOGEN and pH monitoring must be performed at least hourly during the bunkering of POTABLE WATER.

After the free residual HALOGEN level of at least 2.0 MG/L (ppm) and pH level not exceeding 7.8 have been reached, the free residual HALOGEN and pH monitoring must be performed at least once every 4 hours during the bunkering of POTABLE WATER.

A test kit must be available for testing free HALOGEN levels and pH.

Test kits must be accurate to within 0.2 MG/L (ppm) for HALOGEN and must have a testing range of free residual HALOGEN normally maintained in the POTABLE WATER system. Test kits for pH must be accurate to within 0.2.

5.2.1.2.3 Records (08)

Accurate records of this monitoring must be maintained aboard for 12 months and must be available for review during inspections.

5.2.1.2.4 Analyzer-Chart Recorders (06)

HALOGEN and pH analyzer-chart recorders used in lieu of manual tests and logs must be calibrated at the beginning of bunkering or production, and the calibration must be recorded on a chart or in a logbook.

The free residual HALOGEN and pH measured by the HALOGEN/pH analyzer must be accurate to within 0.2 mg/L (ppm) of the free residual HALOGEN and 0.2 of the pH as measured by the manual test.

Calibration is required at the beginning of bunkering or production and each time bunkering or production is restarted.

5.2.1.2.5 Construction (06)

HALOGEN and pH analyzer-chart recorders used on bunker water systems must be constructed and installed according to the manufacturer's guidelines.

5.2.1.2.6 Data Logger

Electronic data loggers with CERTIFIED DATA SECURITY FEATURES may be used in lieu of chart recorders.

If electronic data loggers are used, written documentation from the data logger manufacturer, such as a letter or instruction manual, must be provided to verify that the features are secure.

5.2.1.2.7 Halogen Injection (08)

Water samples for HALOGEN and pH testing must be obtained from a sample cock and/or a HALOGEN analyzer probe located on the bunker or production water line at least 3 meters (10 feet) after the HALOGEN injection point and before the storage tank.

A static mixer may be used to reduce the distance between the HALOGEN injection point and the sample cock or HALOGEN analyzer sample point. If used, the mixer must be installed per the manufacturer's recommendations. A copy of all manufacturers' literature for installation, operation, and maintenance must be maintained.

5.2.1.2.8 Tank Sample

In the event of EQUIPMENT failure, bunker or production water HALOGEN samples may also be taken from previously empty POTABLE WATER TANKS.

5.3 Potable Water System

5.3.1 Potable Water Tanks

5.3.1.1 Protection

5.3.1.1.1 **Potable Water Tank Walls (07 C)**

POTABLE WATER TANKS must not share a common wall with the hull of the vessel or with tanks or piping containing nonpotable water or other liquids.

5.3.1.1.2 **Nonpotable Piping (08)**

Piping systems carrying SEWAGE or other nonpotable liquids must not pass through POTABLE WATER TANKS. Minimize the use of nonpotable lines above POTABLE WATER TANKS. Nonpotable lines above POTABLE WATER TANKS must not have any mechanical couplings.

For SCUPPER lines, factory assembled transition fittings for steel to plastic pipes are allowed when manufactured per American Society for Testing and Materials (ASTM) F1973 or equivalent standard.

5.3.1.1.3 **Coatings (08)**

Interior coatings on POTABLE WATER TANKS must be APPROVED for POTABLE WATER contact by a certification organization. Follow all manufacturers' recommendations for application, drying, and curing.

The following must be maintained on board for the tank coatings used:

- Written documentation of approval from the certification organization (independent of the coating manufacturer).
- Manufacturers' recommendations for application, drying, and curing.
- Written documentation that the manufacturers' recommendations have been followed for application, drying, and curing.

5.3.1.2 Tank Construction

5.3.1.2.1 **Identification (08)**

POTABLE WATER TANKS must be identified with a number and the words "**POTABLE WATER**" in letters at least 13 millimeters (0.5 inch) high.

5.3.1.2.2 Sample Cocks (08)

POTABLE WATER TANKS must have labeled, turned-down sample cocks. They must be identified and numbered with the appropriate tank number.

5.3.1.2.3 Vent/Overflow (08)

The POTABLE WATER TANKS, vents, and overflows must be protected from CONTAMINATION.

5.3.1.2.4 Level Measurement (08)

Any device for determining the depth of water in the POTABLE WATER TANKS must be constructed and maintained so as to prevent contaminated substances or liquids from entering the tanks.

5.3.1.2.5 Manual Sounding (08)

Manual sounding of POTABLE WATER TANKS must be performed only in emergencies and must be performed in a sanitary manner.

5.3.2 Potable Water Piping

5.3.2.1 Protection

5.3.2.1.1 Identification (08)

POTABLE WATER lines must be striped or painted either in accordance with ISO 14726 (blue/green/blue) or blue only.

DISTILLATE and PERMEATE lines directed to the POTABLE WATER system must be striped or painted in accordance with ISO 14726 (blue/gray/blue).

Other lines must not have the above color designations.

These lines must be striped or painted at 5 meter (15 feet) intervals and on each side of partitions, decks, and BULKHEADS except where decor would be marred by such markings. This includes POTABLE WATER supply lines in technical lockers.

POTABLE WATER lines after REDUCED PRESSURE ASSEMBLIES must not be striped or painted as POTABLE WATER.

Striping is not required in FOOD AREAS of the vessel because only POTABLE WATER is permitted in these areas.

All refrigerant brine lines and nonpotable chilled water lines **in all FOOD AREAS**, such as on ice machines, ice cream machines, etc., must be identified **with either ISO 14726 (blue/white/blue)** or by another uniquely identifiable method to prevent CROSS-CONNECTIONS.

5.3.2.1.2 Protection (07 C)

POTABLE WATER piping must not pass under or through tanks holding nonpotable liquids.

5.3.2.1.3 Bunker Connection (08)

The POTABLE WATER bunker filling line must begin either horizontally or pointing downward and at a point at least 460 millimeters (18 inches) above the bunker station deck.

5.3.2.1.4 Cap/Keeper Chain (08)

The POTABLE WATER filling line must have a screw cap fastened by a NONCORRODING cable or chain to an adjacent BULKHEAD or surface in such a manner that the cap cannot touch the deck when hanging free.

The hose connections must be unique and fit only the POTABLE WATER hoses.

5.3.2.1.5 Identification (08)

Each bunker station POTABLE WATER filling line must be striped or painted blue or in accordance with the color designation in ISO 14726 (blue/green/blue) and clearly labeled “**POTABLE WATER FILLING**” in letters at least 13 millimeters (0.5 inch) high, stamped on a noncorrosive label plate or the equivalent, and located at or near the point of the hose connection.

5.3.2.1.6 Technical Water (08)

If used on the vessel, TECHNICAL WATER must be bunkered through separate piping using fittings incompatible for POTABLE WATER bunkering.

This does not apply to water bunkered from shore-side municipal water supply.

5.3.2.1.7 Different Piping (08)

TECHNICAL WATER must flow through a completely different piping system.

5.3.3 Potable Water Hoses

5.3.3.1 Construction

5.3.3.1.1 **Fittings (08)**

POTABLE WATER hoses must have unique fittings from all other hose fittings on the vessel.

5.3.3.1.2 **Identification (08)**

POTABLE WATER hoses must be labeled for use with the words “POTABLE WATER ONLY” in letters at least 13 millimeters (0.5 inch) high at each connecting end.

5.3.3.1.3 **Construction (08)**

All hoses, fittings, and water filters used in the bunkering of POTABLE WATER must be constructed of safe, EASILY CLEANABLE materials APPROVED for POTABLE WATER use and must be maintained in good repair.

5.3.3.1.4 **Other Equipment (08)**

Other EQUIPMENT and tools used in the bunkering of POTABLE WATER must be constructed of safe, EASILY CLEANABLE materials, dedicated solely for POTABLE WATER use, and maintained in good repair.

5.3.3.1.5 **Locker Construction (08)**

POTABLE WATER hose lockers must be constructed of SMOOTH, nontoxic, corrosion resistant, EASILY CLEANABLE material and must be maintained in good repair.

5.3.3.1.6 **Locker Identification (08)**

POTABLE WATER hose lockers must be labeled “POTABLE WATER HOSE AND FITTING STORAGE” in letters at least 13 millimeters (0.5 inch) high.

5.3.3.1.7 **Locker Height (08)**

POTABLE WATER hose lockers must be mounted at least 460 millimeters (18 inches) above the deck and must be self-draining.

5.3.3.1.8 **Locker Closed (08)**

Locker doors must be closed when not in use.

5.3.3.1.9 Locker Restriction (08)

The locker must not be used for any other purpose than storing POTABLE WATER EQUIPMENT such as hoses, fittings, sanitizing buckets, SANITIZER solution, etc.

5.3.3.2 Handling

5.3.3.2.1 Limit Use (08)

POTABLE WATER hoses must not be used for any other purpose.

5.3.3.2.2 Handling (08)

All hoses, fittings, water filters, buckets, EQUIPMENT, and tools used for connection with the bunkering of POTABLE WATER must be handled and stored in a sanitary manner.

5.3.3.2.3 Contamination Prevention (08)

POTABLE WATER hoses must be handled with care to prevent CONTAMINATION from dragging their ends on the ground, pier, or deck surfaces, or from dropping the hose into contaminated water, such as on the pier or in the HARBOR.

5.3.3.2.4 Flush/Drain (08)

POTABLE WATER hoses must be flushed with POTABLE WATER before being used and must be drained after each use.

5.3.3.2.5 Storage (08)

POTABLE WATER hoses must be rolled tight with the ends capped, on reels or on racks or with ends coupled together, and stowed in POTABLE WATER hose lockers.

5.3.4 Potable Water System Contamination

5.3.4.1 Cleaning and Disinfection

5.3.4.1.1 Disinfecting (07 C)

POTABLE WATER TANKS and all affected parts of the POTABLE WATER distribution system must be cleaned, disinfected, and flushed with POTABLE WATER:

- Before being placed in service;
- Before returning to operation after repair, replacement; or
- After being subjected to any CONTAMINATION, including entry into a POTABLE WATER tank.

During dry docks and wet docks, if any work is done to the POTABLE WATER distribution system and piping system that affects a POTABLE WATER TANK(s), the affected POTABLE

WATER TANK(s) must be cleaned and disinfected.

5.3.4.1.2 Inspection (08)

POTABLE WATER TANKS must be inspected, cleaned, and disinfected at least every 2 years.

5.3.4.1.3 Record Retention (08)

Documentation of all inspections, maintenance, cleaning, and DISINFECTION must be maintained for 12 months and must be available for review during inspections.

Records must include method of DISINFECTION, concentration and contact time of the DISINFECTANT, and a recorded HALOGEN value of less than or equal to 5 ppm before the tank is put back into service.

5.3.4.1.4 Disinfection Residual (07 C)

DISINFECTION after potential CONTAMINATION must be accomplished by increasing the free residual HALOGEN to at least 50 MG/L (ppm) throughout the affected area and maintaining this concentration for 4 hours or by way of another procedure submitted to and accepted by VSP.

In an emergency, this contact time may be shortened to 1 hour by increasing free residual HALOGEN to at least 200 MG/L (ppm) throughout the affected area.

Refer to Annex 13.6 for DISINFECTION method examples.

5.3.4.1.5 Documentation (08)

The free HALOGEN residual level must be documented.

5.3.4.1.6 Flush (08)

The disinfected parts of the system must be flushed with POTABLE WATER or otherwise dechlorinated until the free residual HALOGEN is ≤ 5.00 MG/L (ppm). The free HALOGEN test result must be documented.

5.3.5 Potable Water Tank Disinfection Methods

5.3.5.1 Method for Disinfecting Filled Tanks (08)

DISINFECTION must be accomplished by increasing the free residual HALOGEN to at least 50 MG/L (ppm) throughout the tank and maintaining it for 4 hours. Maintain a pH value of 7.8 or less. The DISINFECTION concentration and contact time must be documented.

Verify that the free residual HALOGEN level is ≤ 5.0 MG/L (ppm) and document the measured level before placing the tank back into service.

5.3.5.2 Method for Disinfecting Empty Tanks (08)

The empty tank cleaning and DISINFECTION procedure is **only** APPROVED for routine cleaning and DISINFECTION. It is **not** APPROVED for known or suspected contaminated tanks.

1. Remove (strip) all water from the tank.
2. Clean all tank surfaces, including filling lines, with an appropriate detergent.
3. Rinse all surfaces of the tank thoroughly with POTABLE WATER.
4. Remove (strip) the rinse water from the tank.
5. Wet all surfaces of the tank with at least a 200-MG/L (ppm) solution of chlorine (this can be done using new, clean mops, rollers, sprayers, etc.). Ensure the tank surfaces remain wet with the chlorine solution for at least 2 hours. Check, monitor, and document the DISINFECTION concentration and contact time.
6. Refill the tank and verify the free residual HALOGEN is ≤ 5.0 MG/L (ppm) before placing the tank back into service. Document the free residual HALOGEN level.

5.4 Potable Water System Chemical Treatment

5.4.1 Chemical Injection Equipment

5.4.1.1 Construction and Installation

5.4.1.1.1 Recommended Engineering Practices (06)

All distribution water system chemical injection EQUIPMENT must be constructed and installed in accordance with recommended engineering practices.

5.4.1.2 Operation

5.4.1.2.1 Halogen Residual (04 C)

The halogenation injection EQUIPMENT must provide continuous halogenation of the POTABLE WATER distribution system and must maintain a free residual HALOGEN of ≥ 0.2 MG/L (ppm) and ≤ 5.0 MG/L (ppm) throughout the distribution system.

5.4.1.2.2 Controlled (08)

The amount of chemicals injected into the POTABLE WATER system must be analyzer controlled.

5.4.1.2.3 **Halogen Backup Pump (06)**

At least one backup HALOGEN pump must be installed with an active, automatic switchover feature to maintain the free residual HALOGEN in the event that the primary pump fails, an increase in demand occurs, or the low chlorine alarm sounds.

5.4.1.2.4 **Chemical Injection Dosing Point (06)**

A check valve or nonreturn valve must be installed between the distribution halogen and pH pumps and the injection points. In addition,

- The potable water distribution halogenation and pH chemical injection dosing points must be located on the delivery line downstream of the potable water pumps, OR
- If the injection dosing point is before the potable water pumps, it must be located above the chemical dosing tanks.

5.5 Potable Water System Halogen Monitoring

5.5.1 Halogen Analyzer-Chart Recorder

5.5.1.1 Installation

5.5.1.1.1 **Distant Point (06)**

A HALOGEN analyzer-chart recorder must be installed at a distant point in the POTABLE WATER distribution system where a significant water flow exists and represents the entire distribution system. In cases where multiple distribution loops exist and no pipes connect the loops, there must be an analyzer and chart recorder for each loop.

5.5.1.1.2 **Data Logger**

Electronic data loggers with CERTIFIED DATA SECURITY FEATURES may be used in lieu of chart recorders.

If used, written documentation from the data logger manufacturer, such as a letter or instruction manual, must be provided to verify that the features are secure.

5.5.1.2 Operation

5.5.1.2.1 **Maintenance (06)**

The HALOGEN analyzer-chart recorder must be properly maintained and must be operated in accordance with the manufacturer's instructions.

A manual comparison test must be conducted daily to verify calibration. Calibration must be made whenever the manual test value is >0.2 MG/L (ppm) higher or lower than the analyzer reading.

5.5.1.2.2 Calibration (06)

The daily manual comparison test or calibration must be recorded either on the recorder chart or in a log.

5.5.1.2.3 Accuracy (05)

The free residual HALOGEN measured by the HALOGEN analyzer must be ± 0.2 MG/L (ppm) of the free residual HALOGEN measured by the manual test.

5.5.1.2.4 Test Kit (06)

The HALOGEN test kit used to calibrate the HALOGEN analyzer must be accurate to within 0.2 MG/L (ppm) for HALOGEN and graduated in increments no greater than 0.2 MG/L (ppm) in the range of free residual HALOGEN normally maintained in the POTABLE WATER system.

Ensure all reagents used with the test kit are not past their expiration dates.

Where available, ensure appropriate secondary standards are onboard for electronic test kits to verify test kit operation.

5.5.2 Halogen Analyzer Charts

5.5.2.1 Chart Design

5.5.2.1.1 Range (06)

HALOGEN analyzer-chart recorder charts must have a range of 0.0 to 5.0 MG/L (ppm) and have a recording period of—and limited to—24 hours.

5.5.2.1.2 Data Logger (06)

Electronic data loggers with CERTIFIED DATA SECURITY FEATURES used in lieu of chart recorders must produce records that conform to the principles of operation and data display required of the analog charts, including printing the records.

5.5.2.1.3 Increments (06)

Electronic data logging must be in increments of ≤ 15 minutes.

5.5.2.2 Operation

5.5.2.2.1 **Charts (06)**

HALOGEN analyzer-chart recorder charts must be changed, initialed, and dated daily. Charts must contain notations of any unusual events in the POTABLE WATER system.

If electronic data loggers are used in lieu of chart recorders, notations of any unusual events in the POTABLE WATER system must be recorded in a log.

5.5.2.2.2 **Retention (06)**

HALOGEN analyzer-chart recorder charts must be retained for at least 12 months and must be available for review during inspections.

5.5.2.2.3 **Chart Review (06)**

Records from the HALOGEN analyzer-chart recorder must verify the free residual HALOGEN of ≥ 0.2 MG/L (ppm) and ≤ 5.0 MG/L (ppm) in the water distribution system for at least 16 hours in each 24-hour period since the last inspection of the vessel.

5.5.3 Manual Halogen Monitoring

5.5.3.1 Equipment Failure

5.5.3.1.1 **Every 4 hours (06)**

Free residual HALOGEN must be measured by a manual test kit at the HALOGEN analyzer at least every 4 hours in the event of EQUIPMENT failure.

5.5.3.1.2 **Recording (06)**

Manual readings must be recorded on a chart or log, retained for at least 12 months, and available for review during inspections.

5.5.3.1.3 **Limit (06)**

Repairs on malfunctioning HALOGEN analyzer-chart recorders must be completed within 10 days of EQUIPMENT failure.

5.5.3.1.4 **Alarm (06)**

Provide an audible alarm in a continuously occupied watch station (e.g., the engine control room) to indicate low and high free HALOGEN readings at the distant point analyzer.

5.6 Microbiologic Monitoring

5.6.1 Sampling and Analysis

5.6.1.1 Methodology

5.6.1.1.1 Samples (06)

A minimum of four POTABLE WATER samples per month must be collected and analyzed for the presence of *E. coli*. Samples must be collected from the forward, aft, upper, and lower decks of the vessel.

Sample sites must be changed each month ensure effectively monitoring of all of the POTABLE WATER distribution system.

Follow-up sampling must be conducted for each positive test result.

Microbiological samples from ice machines and POTABLE WATER storage tanks do not count toward the monthly routine distribution system monitoring.

5.6.1.1.2 Analysis (06)

Samples must be analyzed using a method accepted in Standard Methods for the Examination of Water and Wastewater or international Environmental Protection Agency (EPA) APPROVED equivalent. Test kits, incubators, and associated EQUIPMENT must be operated and maintained in accordance with the manufacturers' specifications.

5.6.1.2 Records

5.6.1.2.1 Records (06)

Sample results must be maintained onboard the vessel for at least 12 months and must be available for review during inspections.

5.7 Water Distribution System Protection

5.7.1 Cross-connection Control

5.7.1.1 Program

5.7.1.1.1 Cross-Connections (07 C)

The POTABLE WATER distribution system must be maintained free of CROSS-CONNECTIONS.

5.7.1.1.2 Protection (07 C)

The POTABLE WATER system must be protected against BACKFLOW or other CONTAMINATION by BACKFLOW PREVENTION DEVICES or AIR GAPS. The PERMEATE lines and DISTILLATE lines directed toward the POTABLE WATER system must also be protected.

5.7.1.1.3 Control/Program (08)

The vessel must provide a comprehensive CROSS-CONNECTION control program.

The following connections to the POTABLE WATER system must be protected against BACKFLOW (BACKSIPHONAGE or BACKFLOW) with AIR GAPS or mechanical BACKFLOW PREVENTION DEVICES:

- RWFs such as SWIMMING POOLS, CHILDREN’S/WADING POOLS, WHIRLPOOL SPAS, and similar facilities.
- Decorative water features/fountains.
- Cabin shower hoses, toilets, whirlpool tubs, and similar facilities.
- Photographic laboratory developing machines and UTILITY SINKS.
- Beauty and barber shop spray-rinse hoses.
- Spa steam generators where essential oils can be added.
- Hose-bib connections.
- Garbage grinders and FOOD WASTE SYSTEMS.
- Automatic galley hood washing systems.
- FOOD service EQUIPMENT such as coffee machines, ice machines, juice dispensers, combination ovens, and similar EQUIPMENT.
- Mechanical WAREWASHING machines.
- Detergent dispensers.
- Hospital and laundry EQUIPMENT.
- Air conditioning expansion tanks.
- Boiler feed water tanks.
- Fire system.
- Public toilets, urinals, and shower hoses.
- POTABLE WATER, bilge, and pumps that require priming.
- Freshwater or saltwater ballast systems.
- International fire and fire sprinkler water connections. An RP ASSEMBLY is the only allowable device for this connection.
- POTABLE WATER supply to automatic window washing

systems that can be used with chemicals or chemical mix tanks.

- Water softeners for nonpotable fresh water.
- Water softener and mineralizer drain lines including backwash drain lines. The only allowable protections for these lines are an AIR GAP or an RP ASSEMBLY.
- High saline discharge line from evaporators. The only allowable protections for these lines are an AIR GAP or an RP ASSEMBLY.
- Chemical tanks.
- Other connections between the POTABLE WATER system and a nonpotable water system such as the GRAY WATER system, laundry system, or TECHNICAL WATER system. The only allowable forms of protection for these connections are an AIR GAP or an RP ASSEMBLY.
- BLACK WATER or combined GRAY WATER/BLACK WATER systems. An AIR GAP is the only allowable protection for these connections.
- Any other connection to the POTABLE WATER system where CONTAMINATION or BACKFLOW can occur.
- Hi-Fog or similar suppression systems connected to POTABLE WATER TANKS.

5.7.1.1.4 Log (08)

A CROSS-CONNECTION control program must include, at a minimum, a complete listing of CROSS-CONNECTIONS and the BACKFLOW prevention method or device for each so there is a match to the PLUMBING SYSTEM component and location. AIR GAPS must be included in the listing.

AIR GAPS on faucet taps do not need to be included on the CROSS-CONNECTION control program listing.

The program must set a schedule for inspection frequency. **Repeat devices such as toilets may be grouped under a single device type.**

A log documenting the inspection and maintenance in written or electronic form must be maintained and be available for review during inspections.

5.7.1.2 Device Installation

5.7.1.2.1 Air Gaps and Backflow Prevention Devices (08)

AIR GAPS should be used where feasible and where water under pressure is not required.

BACKFLOW PREVENTION DEVICES must be installed when AIR GAPS are impractical or when water under pressure is required. Provide an AIR GAP for the atmospheric vent of all BACKFLOW PREVENTION DEVICES.

A mechanical BACKFLOW PREVENTION DEVICE must have an atmospheric vent.

5.7.1.2.2 2X Diameter (08)

AIR GAPS must be at least twice the diameter of the delivery fixture opening and a minimum of 25 millimeters (1 inch).

5.7.1.2.3 Flood-Level Rim (08)

An ATMOSPHERIC VACUUM BREAKER must be installed at least 150 millimeters (6 inches) above the flood-level rim of the fixtures.

5.7.1.2.4 After Valve (08)

An ATMOSPHERIC VACUUM BREAKER must be installed only in the supply line on the discharge side of the last control valve.

5.7.1.2.5 Continuous Pressure (08)

A CONTINUOUS PRESSURE-type BACKFLOW PREVENTION DEVICE must be installed when a valve is located downstream from the BACKFLOW PREVENTION DEVICE.

5.7.1.2.6 Backflow Prevention Devices (08)

BACKFLOW PREVENTION DEVICES must be provided on all fixtures using POTABLE WATER and that have submerged inlets.

5.7.1.2.7 Vacuum Toilets (08)

An ATMOSPHERIC VACUUM BREAKER must be installed on a POTABLE WATER supply connected to a vacuum toilet system. An ATMOSPHERIC VACUUM BREAKER must be located on the discharge side of the last control valve (flushing device).

5.7.1.2.8 Diversion Valves (08)

Lines to divert POTABLE WATER to other systems by valves or interchangeable pipe fittings must have an AIR GAP after the valve.

5.7.1.2.9 Location (08)

BACKFLOW PREVENTION DEVICES and AIR GAPS must be ACCESSIBLE for inspection, testing, service, and maintenance. If access panels are required, provide panels large enough for testing, service, and maintenance.

5.7.1.3 Air Supply Connections

5.7.1.3.1 Air Supply (08)

A compressed air system that supplies pressurized air to both nonpotable and POTABLE WATER pneumatic tanks must be connected through a press-on (manual) air valve or hose.

5.7.1.3.2 Separate Compressor

A fixed connection may be used when the air supply is from a separate compressor used exclusively for POTABLE WATER pneumatic tanks.

5.7.2 Backflow Prevention Device Inspection and Testing

5.7.2.1 Maintenance

5.7.2.1.1 Maintained (08)

BACKFLOW PREVENTION DEVICES must be maintained in good repair.

5.7.2.2 Inspection and Service

5.7.2.2.1 Schedule (08)

BACKFLOW PREVENTION DEVICES should be periodically inspected and any failed units must be replaced.

A visual check must be completed for all nontestable BACKFLOW PREVENTION DEVICES and AIR GAPS at least annually.

5.7.2.2.2 Test Annually (08)

BACKFLOW PREVENTION DEVICES requiring testing (e.g., reduced pressure BACKFLOW PREVENTION DEVICES and PRESSURE VACUUM BREAKERS) must be inspected and tested with a test kit after installation and at least annually. Test results showing the pressure differences on both sides of the valves must be maintained for each device.

5.7.2.2.3 Records (08)

The visual inspection and/or test results for BACKFLOW PREVENTION DEVICES and AIR GAPS must be retained for at least 12 months and must be available for review during inspections.

5.8 Potable Water Knowledge

5.8.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of POTABLE WATER operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of POTABLE WATER operations. The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector’s questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of POTABLE WATER operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

6.0 Recreational Water Facilities (RWFs)

This section includes the following subsections:

- 6.1 RWFs
- 6.2 Flow-Through Seawater RWFs
- 6.3 Recirculating RWFs
- 6.4 WHIRLPOOL SPAS and SPA POOLS
- 6.5 Maintenance and Operating Standards for Combined Facilities
- 6.6 Private Cabin Operations
- 6.7 Individual Hydrotherapy Pools
- 6.8 Safety
- 6.9 Restrictions
- 6.10 Knowledge

References for 6.0 Recreational Water Facilities (RWFs) can be found in Annex 14.6.

6.1 RWFs

6.1.1 Source

6.1.1.1 Potable Water or Seawater (09 C)

The water source for all RWFs must be POTABLE WATER or RECREATIONAL SEAWATER.

6.1.2 Maintenance

6.1.2.1 Management

RWFs must be kept clean of debris, organic materials, and slime/biofilm in ACCESSIBLE areas in the water and on surfaces.

It is recommended to conduct periodic biofilm management in WHIRLPOOL SPAS, SPA POOLS, and interactive RWFs.

6.2 Flow-Through Seawater RWFs

6.2.1 Operation

6.2.1.1 At Sea

6.2.1.1.1 12 miles (10)

Flow-through seawater supply systems for RWFs must be used only while the vessel is MAKING WAY and at sea beyond 20 kilometers (12 miles) from nearest land.

6.2.1.2 In Port

6.2.1.2.1 ***Drained or Switched to Recirculation (10)***

Before arriving to a port or HARBOR, the RWF must be drained before the vessel reaches the 20-kilometer (12-mile) mark or any point of land-based discharge as detailed in section 6.2.1.1.1 and it must remain empty while in port or at anchor.

OR

The RECREATIONAL SEAWATER filling system must be shut off 20 kilometers (12 miles) before reaching the nearest land or land-based discharge point, and a recirculation system must be used with appropriate filtration and halogenation systems.

6.2.1.2.2 ***Halogen and pH (09 C)***

When switching from flow-through operations to recirculation operations, the RWF must be closed until the free residual HALOGEN and pH levels are within the acceptable limits of this manual. The sample must be taken from the body of the RWF, not from the pump room.

While the RWF is closed, batch HALOGEN and pH control chemicals may be used to obtain ADEQUATE free HALOGEN residuals and pH levels in a more-timely manner. Sufficient time should be allowed before opening the RWF for use to ensure proper mixing of batch chemicals.

6.3 Recirculating RWFs

(See individual sections for additional requirements for whirlpools and SPA POOLS. See Annex 13.8 for requirements for BABY-ONLY WATER FACILITIES.)

6.3.1 Operation

6.3.1.1 **Fill Level and Turnover Rates (10)**

For RWF with skim gutters, the fill level of the RWF must be to the skim gutter level.

TURNOVER rates: Recirculation systems and EQUIPMENT, including chemical control EQUIPMENT, UV DISINFECTION systems, filters, and pumps, must be designed to maintain ADEQUATE water chemistry control while operating at the following TURNOVER rates:

RECREATIONAL WATER FACILITY	TURNOVER Rate
SWIMMING POOL (<i>VSP 2005 Construction Guidelines or earlier</i>)	6 hours
SWIMMING POOL (<i>VSP 2011 Construction Guidelines or later</i>)	4 hours
CHILDREN’S POOL	0.5 hours
WADING POOL	1 hours
WHIRLPOOL SPA	0.5 hours
SPA POOL	2 hours
INTERACTIVE RWF or ACTIVITY POOL (<610 millimeters [24 inches] deep)	1 hours
INTERACTIVE RWF or ACTIVITY POOL (>610 millimeters [24 inches] deep)	2 hours
BABY-ONLY WATER FACILITY	0.5 hours

SPA POOLS that were constructed before June 1, 2005, and were originally considered SWIMMING POOLS may have a TURNOVER rate not to exceed 6 hours in a 24-hour period. This does not apply to SWIMMING POOLS that have been converted to SPA POOLS.

An RWF slide combined with a pool must have a TURNOVER rate that matches the rate for the pool.

Use flow rates from flow meters to calculate TURNOVER rates. Do not use the manufacturer’s pump rate to calculate TURNOVER rates.

The pool in “An RWF slide combined with a pool must have a TURNOVER rate that matches the rate for the pool” refers to either WADING or SWIMMING POOLS but not to CHILDREN’S POOLS. In addition, the water for the slide must come directly from the basin of the pool and return directly to the basin of the pool.

For facilities that meet the definition of more than one type of RWF, the more protective TURNOVER rate applies. For example, if a CHILDREN’S POOL also has features of an interactive RWF or ACTIVITY POOL, the TURNOVER rate must be 0.5 hours. The only exception is that when a slide is combined with a pool, the TURNOVER rate for the combined system may match the rate for the pool. However, if a pool and slide combination is also combined with another facility, the most protective TURNOVER rate applies. Finally, if a facility is modified, the most protective TURNOVER rate applies.

6.3.1.2 Filtration Systems

6.3.1.2.1 *Filtered (10)*

Recirculated RWF water must be filtered.

6.3.1.2.2 *Filter Backwash and Cleaning (10)*

Filter pressure differentials must be monitored. Granular filter media must be backwashed until the water viewed through a sight glass runs clear and at the following frequency:

- WHIRLPOOL SPA and SPA POOL: every 72 hours, or sooner if the WHIRLPOOL SPA is drained.
- BABY-ONLY WATER FACILITY: daily.
- All other RWFs: at a frequency recommended by the manufacturer.

For automatic backwashing systems, an individual must be present in the filter room to ensure that backwashing is repeated as necessary until the water runs clear.

Cartridge filters must be cleaned according to the manufacturer's recommendations.

A written or electronic record of the filter backwashing and cleaning must be available for review during inspections.

6.3.1.2.3 *Granular Filter Inspection, Core Sample Test, and Filter Change (10)*

Granular filter media must be examined for channels, mounds, or holes. A core sample of the filter media must be inspected for excessive organic material accumulation using a recommended sedimentation method.

Inspections and sedimentation tests must be conducted quarterly for all RWFs.

Inspection method:

Drain the water from the filter housing and inspect the granular filter for channels, mounds, or holes.

Core sample method:

1. **After inspection, take a sand sample from the filter core and place it in a clear container. A core sample can be taken by inserting a rigid hollow tube or pipe into the filter media.**
2. **Add clean water to the container, cover, and shake.**
3. **Allow the container to rest undisturbed for 30 minutes.**

4. **Consider media replacement if after 30 minutes of settling, a measurable layer of sediment is within or on top of the filter media or fine, colored particles are suspended in the water. This condition can mean the organic loading may be excessive.**

Granular filter media for WHIRLPOOL SPAS and SPA POOLS must be changed based on the inspection and sedimentation test results or every 12 months, whichever is more frequent. For all other RWFs, granular filter media must be changed based on the inspection and sedimentation results or per the manufacturer's recommendations, whichever is more frequent.

Results of both the filter inspection and sedimentation test must be recorded.

6.3.1.2.4 Cartridge Filter Inspection and Filter Change (10)

Cartridge or canister-type filters must be inspected weekly for WHIRLPOOL SPAS and SPA POOLS. For all other RWFs, cartridge filters must be inspected every 2 weeks, or in accordance with the manufacturer's recommendation, whichever is more frequent.

The filters must be inspected for cracks, breaks, damaged components, and excessive organic accumulation. Cartridge or canister-type filters must be changed based on the inspection results, or as recommended by the manufacturer, whichever is more frequent.

At least one replacement cartridge or canister-type filter must be available.

6.3.1.2.5 Other Filter Media (10)

Inspect and change filters based on the manufacturer's recommendations.

6.3.1.2.6 Filter Housing Cleaning and Disinfection (10)

The filter housing must be cleaned, rinsed, and disinfected before the new filter media is placed in it. DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT. At a minimum, a 50-ppm solution for 1 minute, or equivalent CT VALUE, must be used. Records must be maintained on all inspection and cleaning procedures.

The filter housing must be cleaned, rinsed, and disinfected each time the filter media—including cartridge filter—is changed.

6.3.1.2.7 Hair and Lint Strainer (10)

The hair and lint strainer and hair and lint strainer housing on all RWFs must be cleaned, rinsed, and disinfected weekly.

DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT. At a minimum, a 50-ppm solution for 1 minute, or equivalent CT VALUE, must be used. Records must be maintained on all inspection and cleaning procedures.

If there is not a hair and lint strainer but there is a filter before the pump, this filter must be cleaned, rinsed, and disinfected weekly.

6.3.1.2.8 All Filters (10)

The manufacturer's maintenance procedures and recommendations for all filters must be maintained on the vessel.

6.3.1.3 Gauges (10)

RWF filter pressure gauges, flow meters, and valves must be replaced when they are defective.

6.3.1.4 Manuals (10)

The operating manuals for all RWF components such as filters, pumps, halogenation and PH control systems, and UV DISINFECTION systems must be maintained in a location ACCESSIBLE to crew members responsible for the **technical** operation and maintenance of these facilities.

6.3.1.5 Bather Loads (10)

Documentation must be maintained on the maximum bather load for each RWF. The maximum bather load must be based on the following factor: One person per five gallons (19 liters) per minute of recirculation flow.

Use flow rates from flow meters to calculate bather loads. Do not use the manufacturer's pump rate to calculate bather loads.

6.3.1.6 Water Quality

6.3.1.6.1 Water Chemistry (10)

The RWF's flow rates, free and combined HALOGEN levels, pH, total alkalinity, and clarity must be monitored and adjusted as recommended by the manufacturer to maintain optimum public health protection and water chemistry.

Evaluate bather load and make adjustments to water parameters to maintain optimum water quality.

Install flow meters to monitor flow rates. Only combined chlorine must be monitored.

Combined bromine does not need to be monitored.

“Manufacturer” refers to the RWF manufacturer and also to manufacturers of the pumps, filters, flow meters, and any other associated EQUIPMENT.

6.3.1.6.2 Fecal and Vomit Accident (10)

A fecal and vomit accident response procedure that meets or exceeds the procedure provided in Annex 13.9 must be available for review during inspections.

6.3.1.6.3 Record of Fecal and Vomit Accidents (10)

A written or electronic record must be made of all accidents involving fecal material or vomit. The record must include the name of the RWF, date and time of the accident, type of accident, response steps taken, and free residual HALOGEN level and contact time reached during DISINFECTION. For a fecal accident, the record must also include whether the fecal material was formed or loose.

6.3.2 Halogenation

6.3.2.1 Residual Halogen: Halogen and pH Dosing Systems (10)

Automated systems must be installed for HALOGEN-based DISINFECTION and pH control dosing. The amounts injected must be controlled by flow meters or free HALOGEN and pH analyzers.

When conducting manual tests, consideration should be given to the HALOGEN and pH levels in the RWF over the HALOGEN and pH readings from the pump room.

Initial chemistry balance can be achieved by manual dosing methods following events such as fecal or vomit accidents and when changing from flow-through seawater to recirculation mode.

6.3.2.1.1 Residual (09 C)

A free residual HALOGEN in the range detailed in the table below must be maintained in recirculated RWFs.

RECREATIONAL WATER FACILITY	Free HALOGEN Residual, MG/L (ppm)
SWIMMING POOL	≥ 1.0 and ≤ 5.0
CHILDREN’S POOL	≥ 1.0 and ≤ 5.0
WADING POOL	≥ 1.0 and ≤ 5.0
INTERACTIVE RWF (ACTIVITY POOL)	≥ 2.0 and ≤ 5.0
BABY-ONLY WATER FACILITY	≥ 3.0 and ≤ 10.0 free chlorine ≥ 4.0 and ≤ 10.0 bromine
WHIRLPOOL SPA and SPA POOL	≥ 3.0 and ≤ 10.0 free chlorine ≥ 4.0 and ≤ 10.0 bromine

For facilities that meet the definition of more than one type of RWF, the more protective HALOGEN residual applies. For example, if a CHILDREN’S POOL also has features of an interactive RWF or ACTIVITY POOL, the HALOGEN range must be 2.0 to 5.0 MG/L (ppm). Finally, if a facility is modified, the most-protective HALOGEN residual applies.

6.3.2.1.2 pH (09 C)

The pH level in all RWFs must be maintained between 7.0 and 7.8. Facilities not maintained within these HALOGEN and pH ranges must be immediately closed.

6.3.2.1.3 Maintenance (10)

Halogenation and pH control systems must be maintained in good repair and operated in accordance with the manufacturer’s recommendations.

6.3.2.1.4 Procedures for Water Sampling (10)

Manual samples from the RWF tub must be compared to the analyzer samples in the pump (mechanical) room to assess potential water quality differences in the RWF.

Recommended manual sampling procedures—All samples should be obtained from a location with the following qualities:

- At least 18 inches (45.7 cm) below the surface of the water, and
- At water depth of between 3 and 4 feet (91.4 cm to 1.2 m) when available, and
- Between water inlets.

6.3.2.2 Residual Halogen and pH Monitoring

6.3.2.2.1 Test Kit (10)

A test kit must be available for testing water quality parameters including free and total HALOGEN levels (chlorine and bromine, where applicable), pH, and total alkalinity.

Test kits must be accurate to within 0.2 MG/L (ppm) for HALOGEN and must have a testing range of free residual HALOGEN normally maintained in the RWF. Test kits for PH must be accurate to within 0.2.

Reagents must not be past their expiration dates.

6.3.2.2.2 Test Kit Maintenance and Verification (10)

Where available, appropriate secondary standards must be onboard for electronic test kits to verify test kit operation.

6.3.2.2.3 Automated Free Halogen Residual and pH Testing (10)

Install chart recorders or electronic data loggers with **CERTIFIED DATA SECURITY FEATURES** that record PH and HALOGEN measurements for each individual RWF. The sample line for the analyzer probe (monitoring) must be either directly from the RWF or on the return line from each RWF and before the compensation tank. Install appropriate sample taps for analyzer calibration.

In the event of EQUIPMENT failure, free residual HALOGEN and pH must be measured by a manual test kit at the RWF or return line at least hourly for WHIRLPOOL SPAS, SPA POOLS, CHILDREN'S POOLS, and WADING POOLS and every 4 hours for all other RWFs.

If two RWFs are combined and the water for one RWF comes from and returns to the basin of the other RWF (not the compensation tank), separate monitoring systems are not required. Monitoring is then only required on the main RWF (e.g., a slide and SWIMMING POOL). Note: During operational inspections, VSP will take manual samples of both RWFs.

Manual samples from the RWF tub should be compared to the analyzer samples in the pump room to assess potential water quality differences in the RWF.

Recommended manual sampling procedures—All samples should be obtained from a location with the following qualities:

- **At least 18 inches (45.7 cm) below the surface of the water, and**
- **At water depth of between 3 and 4 feet (91.4 cm to 1.2 m) when available, and**
- **Between water inlets.**

Manual readings must be recorded on a chart or log, retained for at least 12 months, and available for review during inspections.

Repairs on malfunctioning HALOGEN analyzer-chart recorders must be completed within 30 days of EQUIPMENT failure.

Provide an audible alarm in a continuously occupied watch station (e.g., the engine control room) to indicate low and high free HALOGEN and pH readings in each RWF.

6.3.2.2.4 Whirlpool and Spa Pool Probes (10)

For WHIRLPOOL SPAS and SPA POOLS, the analyzer probes for dosing and recording systems must be capable of measuring and recording levels up to 10 MG/L (10 ppm).

6.3.2.2.5 Analyzer-Chart Recorder (10)

The HALOGEN and PH analyzer-chart recorder must be properly maintained and operated in accordance with the manufacturer's instructions.

A manual comparison test must be conducted before opening the RWF to verify calibration for free HALOGEN residual and PH. The analyzer reading must be within 0.2 MG/L (ppm) for free HALOGEN and between pH 7.0–7.8.

For RWFs open longer than 24 hours, a manual comparison test must be conducted every 24 hours.

6.3.2.2.6 Data Logger (10)

If an electronic data logger is used in lieu of a chart recorder, it must have CERTIFIED DATA SECURITY FEATURES.

Manual comparison tests for free HALOGEN residual and pH must be conducted before opening the RWF to verify calibration. The analyzer reading must be within 0.2 MG/L (ppm) for free HALOGEN and 0.2 for pH.

For RWFs open longer than 24 hours, a manual comparison test must be conducted every 24 hours.

Electronic data logging must be in increments of ≤ 15 minutes.

6.3.2.2.7 Charts (10)

HALOGEN analyzer-chart recorder charts must be initialed, dated, and changed daily.

Strip recorder charts must be initialed and dated daily and 24-hour increments must be indicated.

Dual-scale HALOGEN analyzer-chart recorder charts used in RWFs must be able to measure the full range of HALOGEN/pH of the facility type to which the chart is installed; for example, chlorine/bromine to 10.0 MG/L (ppm) and pH 0-14 for WHIRLPOOL SPAS.

6.3.2.2.8 Logs (10)

Logs and charts must contain notations outlining actions taken when the free HALOGEN residual or pH levels are outside of the acceptable ranges in this manual.

Additionally, records must include any major maintenance work on the filtration and halogenation systems and UV DISINFECTION systems.

A written or electronic log of RWF filter inspection results, granular filter sedimentation test results, backwashing frequency and length of backwashing, and date and time of water dumping must be available for review during inspections.

6.3.2.2.9 Retention (10)

Logs and charts must be retained for 12 months and must be available for review during inspections.

6.4 Whirlpool Spas and Spa Pools

6.4.1 Public Operations

6.4.1.1 Filters

6.4.1.1.1 Replacement (10)

At least one replacement cartridge or canister-type filter must be available.

6.4.1.2 Water Quality

6.4.1.2.1 **Changed (10)**

The WHIRLPOOL SPA water, including compensation tank, filter housing, and associated piping, must be changed every 72 hours, provided that the system is operated continuously and that the correct water chemistry levels are maintained during that period, including daily shock halogenation.

SPA POOL water must be changed as often as necessary to maintain proper water chemistry. The water must be changed at least every 30 days.

The date and time of WHIRLPOOL SPA and SPA POOL water changes must be recorded in the log.

6.4.2 Halogenation

6.4.2.1 Residual Halogen

6.4.2.1.1 **Prolonged Maintenance (10)**

For facilities undergoing maintenance for longer than 72 hours, the free HALOGEN residual and pH levels must be maintained or the entire system must be drained completely of all water. This includes the WHIRLPOOL SPA and SPA POOL tubs, compensation tanks, filter housings, and all associated piping and blowers.

Records must be maintained for the free HALOGEN and pH levels or the complete draining of the system.

6.4.2.1.2 **Shock Halogenation (10)**

The free residual HALOGEN must be increased to at least 10.0 MG/L (ppm) and circulated for at least 1 hour every 24 hours.

The free residual HALOGEN must be tested at both the start and completion of shock halogenation.

The water in the entire RWF system must be superhalogenated to 10 ppm to include the WHIRLPOOL SPA/SPA POOL tub, compensation tank, filter housing, and all associated piping before starting the 1-hour timing.

HEATED ACTIVITY POOLS, including interactive RWFs, that have features that break the water surface of the RWF or create a mist must be shock halogenated as described. This includes

ACTIVITY POOLS and INTERACTIVE RWFs that can be HEATED by the sun and/or exterior temperature.

Batch halogenation of the tub and compensation tank may help in reaching the minimum 10 ppm residual quickly.

Facilities filled only with seawater are exempt from this requirement.

6.4.2.1.3 Records (10)

A written or electronic record of the date and time of water dumping and shock halogenation (concentration in MG/L [ppm] at the start and completion and time) must be available for review during inspections.

6.4.2.1.4 Retention (10)

Records must be retained on the vessel for 12 months.

6.5. Maintenance and Operating Standards for Combined Facilities

6.5.1 Pool with Attached Whirlpool Spa (10)

For any pool with an attached WHIRLPOOL SPA where the water, recirculation system EQUIPMENT, or filters are shared with the spa, all elements of the WHIRLPOOL SPA standards must apply to the pool.

6.5.1.2 Fecal Accidents (10)

For combined facilities subject to fecal accidents, fecal accident procedures must include all features of these combined facilities.

6.6 Private Cabin Operations

WHIRLPOOL SPAS similar in design and construction to public WHIRLPOOL SPAS but located for the sole use of an individual cabin or groups of cabins must comply with the public WHIRLPOOL SPA requirements if the WHIRLPOOL SPA

- **Has a tub capacity of more than 4 individuals OR**
- **Can be accessed without entering the cabin.**

6.6.1 Maintenance

6.6.1.1 Cleaning (10)

Private WHIRLPOOL SPAS located in individual passenger cabins must be cleaned and disinfected, including associated recirculation systems, between occupancies or weekly, whichever is more frequent.

DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT at 10 ppm for 60 minutes, or an equivalent CT VALUE.

6.6.1.2 Maintenance (10)

Manufacturer's operation and maintenance instructions must be available to personnel who service the units.

6.6.1.3 Records (10)

A record must be maintained outlining the frequency of cleaning and DISINFECTION. The record must include the type, concentration, and contact time of the DISINFECTANT.

Records must be retained on the vessel for 12 months.

6.7 Individual Hydrotherapy Pools

6.7.1 Maintenance

6.7.1.1 Cleaning (10)

Individual hydrotherapy pools must be cleaned and disinfected, including associated recirculation systems, between customers. DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT at 10 ppm for 60 minutes, or an equivalent CT VALUE.

6.7.1.2 Maintenance (10)

Manufacturer's operation and maintenance instructions must be available to personnel who service the units.

6.7.1.3 Records (10)

A record must be maintained outlining the frequency of cleaning and DISINFECTION. The record must include the type, concentration, and contact time of the DISINFECTANT.

Records must be retained on the vessel for 12 months.

6.8 Safety

6.8.1 RWFs

6.8.1.1 Signs and Markings

6.8.1.1.1 General RWF Signs (10)

Safety signs must be provided for all RWFs except BABY-ONLY WATER FACILITIES.

The signs at a minimum must include the following words:

- Do not use these facilities if you are experiencing diarrhea, vomiting, or fever.
- No children in diapers or who are not toilet trained.
- Shower before entering the facility.
- Bather load #.

Pictograms may replace words, as appropriate or available.

For children's RWF signs, include the exact wording "TAKE CHILDREN ON FREQUENT BATHROOM BREAKS" or "TAKE CHILDREN ON FREQUENT TOILET BREAKS."

It is advisable to post additional cautions and concerns on signs.

See section 6.3.1.5 for bather load calculations.

6.8.1.1.2 Depth Markers (10)

The depth of each RWF deeper than 1 meter (3 feet) must be displayed prominently so it can be seen from the deck and in the pool. Depth markers should be labeled in both feet and meters. Additionally, depth markers must be installed for every 1-meter (3-foot) change in depth.

6.8.1.1.3 Spas (10)

In addition to the safety sign requirements in section 6.7.1.1.1, install a sign at each WHIRLPOOL SPA and SPA POOL entrance listing precautions and risks associated with the use of these facilities. At a minimum, include cautions against use by the following:

- Individuals who are immunocompromised.
- Individuals on medication or who have underlying medical conditions such as cardiovascular disease, diabetes, or high or low blood pressure.
- Children, pregnant women, and elderly persons.

Additionally, caution against exceeding 15 minutes of use.

Vessels can submit existing signs for review by VSP.

It is advisable to post additional cautions and concerns on signs.

Those under 16 years of age are considered children for the purpose of whirlpool safety sign requirements.

6.8.1.2 Equipment

6.8.1.2.1 *Life Saving (10)*

A rescue or shepherd's hook and an APPROVED flotation device must be provided at a prominent location (visible from the full perimeter of the pool) at each RWF that has a depth of 1 meter (3 feet) or greater. These devices must be mounted in a manner that allows for easy access during an emergency.

- The pole of the rescue or shepherd's hook must be long enough to reach the center of the deepest portion of the pool from the side plus 0.6 meters (2 feet). It must be a light, strong, nontelelescoping material with rounded, nonsharp ends.
- The APPROVED flotation device must include an attached rope that is at least two-thirds of the maximum pool width.

The rescue or shepherd's hook must be long enough to touch the bottom center of the deepest portion of the RWF plus 2 feet (0.6 meters) as measured from the closest edge without an obstruction. This edge can only be used for measurement if someone could freely walk down both sides without an obstruction such as a waterfall, fountain, statue, etc.

For a rectangular pool, the shorter distance would be from the long side of the rectangle as long as there are no obstructions (Figure 6-1). The 2 feet (0.6 meters) is measured from where the shepherd's hook crosses the fill line of the RWF.

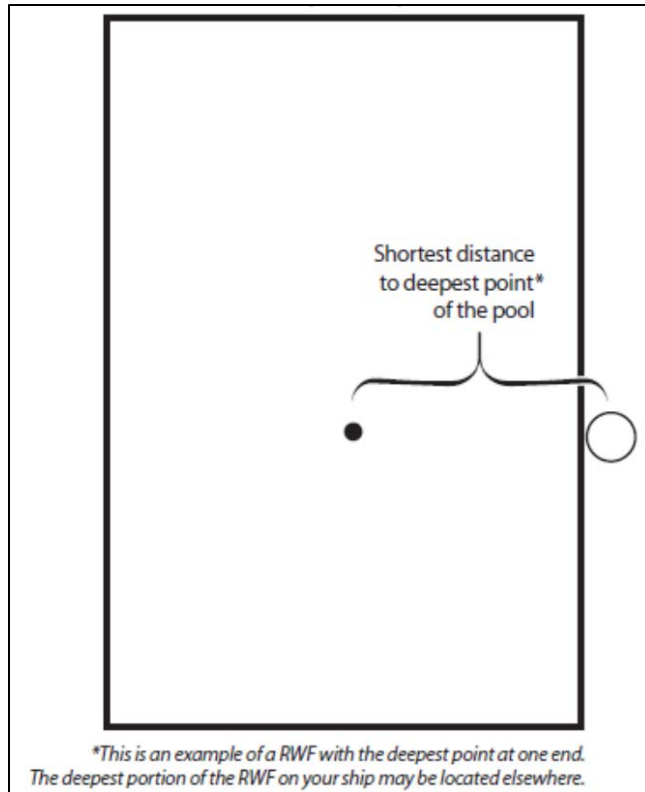


Figure 6-1 - Shortest distance in a rectangular pool

For RWFs with a beach level, the measurement can be from the edge of the tub (Figure 6-2).

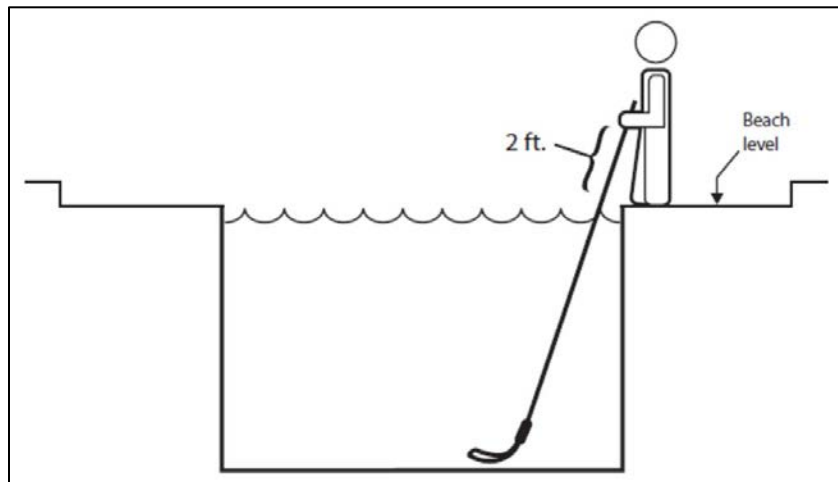


Figure 6-2 - Measurement in RWFs with a beach level

6.8.1.2.2 Antientrapment Drain (10)

ANTIENRAPMENT/ANTIENANGLEMENT requirements for drain covers and SUCTION FITTINGS in RWFs are shown in Table 6.7.1.2.2. **This does not apply to facilities with zero depth where the drains are not under direct suction.**

VSP is aware that the requirements shown in Table 6.7.1.2.2 for existing vessels may not fully meet the letter of the Virginia Graeme Baker Act, but we also recognize the life-safety concerns for rapid dumping of RWFs in conditions of instability at sea. Therefore, it is the owner's decision to meet or exceed the VSP requirements.

Testing of manufactured drain covers must be by a nationally or internationally recognized testing laboratory.

The information below must be stamped on each manufactured ANTIENTRAPMENT drain cover:

- Certification standard and year.
- Type of drain use (single or multiple).
- Maximum flow rate (in gallons or liters per minute).
- Type of fitting (suction outlet).
- Life expectancy of cover.
- Mounting orientation (wall, floor, or both).
- Manufacturer's name or trademark.
- Model designation.

The design of custom/shipyard constructed (field fabricated) drain covers and SUCTION FITTINGS must be fully specified by a REGISTERED DESIGN PROFESSIONAL in accordance with ASME A112.19.8-2007. The specifications must fully address cover/grate loadings, durability, hair, finger and limb entrapment issues, cover/grate secondary layer of protection, related sump design, and features specific to the RWF.

A letter from the shipyard must accompany each custom/shipyard constructed (field fabricated) drain cover fitting. At a minimum the letter must specify the shipyard, name of the vessel, specifications and dimensions of the drain cover, as detailed above, as well as the exact location of the RWF for which it was designed. The name of and contact information for the REGISTERED DESIGN PROFESSIONAL and signature must be on the letter.

Table 6.8.1.2.2 ANTIENTRAPMENT Requirements for Recreational Water Facilities

Option*	Type	Drainage/Recirculation System	Cover Design	Secondary ANTI-ENTRAPMENT Requirement**
1	GRAVITY only	Multiple drains (2 or more drains greater than 3 feet apart)	Standard design (not compliant with ASME A112.19.8)	Alarm
2	GRAVITY only	Multiple drains (2 or more drains greater than 3 feet apart)	ASME A112.19.8 compliant cover	None
3	GRAVITY only	Single UNBLOCKABLE drain (per ASME A112.19.8)	Standard design (not compliant with ASME A112.19.8)	Alarm
4	GRAVITY only	Single UNBLOCKABLE drain (per ASME A112.19.8)	ASME A112.19.8 compliant cover	None
5	GRAVITY only	Single BLOCKABLE drain or multiple drains (less than 3 feet apart)	ASME A112.19.8 compliant cover	GDS
6	SUCTION FITTING	Multiple drains (2 or more drains per pump with drains greater than 3 feet apart)	ASME A112.19.8 compliant cover	None
7	SUCTION FITTING	Single UNBLOCKABLE drain (per ASME A112.19.8-2007)	ASME A112.19.8 compliant cover	SVRS or APS
8	SUCTION FITTING	Single BLOCKABLE drain or multiple drains (less than 3 feet apart)	ASME A112.19.8 compliant cover	SVRS or APS

*Options 1 through 5 are for fittings not under direct suction. These include both fittings to drain the RWF and fittings used to recirculate the water. Options 6 through 8 are for fittings under direct suction. These include fittings to drain the RWF and fittings used to recirculate the water.

**Definitions:

- Alarm: The audible alarm must sound in a continuously manned space AND at the RWF. This alarm is for all draining: accidental, routine, and emergency.
- GDS (GRAVITY DRAINAGE system): A drainage system that uses a collector tank from which the pump draws water. Water moves from the RWF to the collector tank due to atmospheric pressure, gravity, and the displacement of water by bathers. There is no direct suction at the RWF.
- SVRS (safety vacuum release system): A system that stops operation of the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected. System must be tested by an independent third party and found to conform with ASME/ANSI A112.19.17 or ASTM standard F2387.
- APS (automatic pump shut-off system): A device that detects a blockage and shuts off the pump system. A manual shut-off near the RWF does not qualify as an APS.

ASME A112.19.8-2007 has been replaced by ANSI/APSP-16 2011. ANTIENTRAPMENT protection EQUIPMENT (covers, SUCTION FITTINGS, safety vacuum release system—SVRS**, etc.) must comply with ASME A112.19.8-2007—or any successor standards—whether the EQUIPMENT is manufactured or field fabricated.

6.8.1.2.3 Temperature (10)

A temperature-control mechanism to prevent the temperature from exceeding 40°C (104°F) must be provided on WHIRLPOOL SPAS and SPA POOLS. The water temperature must be measured within the WHIRLPOOL SPA or SPA POOL tub itself.

6.9 RWF Showers and Toilet Facilities

Vessels constructed to the 2018 Construction Guidelines or later must have toilets and showers installed.

6.9.1 Temperature and Location

Showers must provide POTABLE WATER at a temperature not to exceed 43°C (110°F) during normal operations. Showers must be installed within 10 meters (33 feet) of every entry point to each RWF. For beach entry RWFs, a minimum of one showerhead must be installed per 10 meters (33 feet) of perimeter within 10 meters (33 feet) of the beach perimeter. A minimum of one shower must be installed at each water slide staircase entrance.

6.9.2 Showers for Children

RWFs designed for use by children under 6 years of age must have appropriately sized shower facilities. Standard height is acceptable, but the mechanism to operate the flow of water must not be more than 1 meter above the deck.

6.9.3 Toilet Facilities

Toilet facilities must be located within one fire zone (approximately 48 meters [157 feet]) of each RWF and on the same deck or adjacent decks if there is no obstruction between RWF area and entrances to the toilets. If toilets are not located on the same deck they must be easily visible and ACCESSIBLE from the RWF area. A minimum of two separate toilet rooms (either two unisex or one male and one female) must be installed. Each toilet facility must include a toilet and a handwashing facility. Urinals may be installed in addition to the required toilet, but may not replace the toilet.

6.10 Restrictions

6.10.1 Diapers (10)

Children in diapers or who are not toilet trained must be prohibited from using any RWF not specifically designed and APPROVED for use by children in diapers.

Specifications and requirements for BABY-ONLY WATER FACILITIES can be found in Annex 13.8.

6.11 Recreational Water Facilities Knowledge

6.11.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of RECREATIONAL WATER FACILITIES operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of RWF operations. The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector’s questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of RWF operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

7.0 Food Safety

This section includes the following subsections:

- 7.1 Reserved
- 7.2 Personnel
- 7.3. FOOD
- 7.4 EQUIPMENT and UTENSILS
- 7.5 WAREWASHING
- 7.6 Poisonous and Toxic Materials
- 7.7 Facilities

References for 7.0 Food Safety can be found in Annex 14.7.

7.1 Reserved

7.2 Personnel

7.2.1 Food Safety Management

7.2.1.1 Food Safety Knowledge

7.2.1.1.1 **Knowledge (13 C)**

Because of the risks for foodborne illness inherent to the FOOD operation, the supervisor or PERSON IN CHARGE of FOOD operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of foodborne disease prevention, application of the HAZARD ANALYSIS CRITICAL CONTROL POINT principles, and the FOOD safety guidelines in this manual. The supervisor or PERSON IN CHARGE must demonstrate this knowledge

- By compliance with these guidelines,
- By being a domestically or foreign certified FOOD protection manager who has shown proficiency of required information through passing a test that is part of an ACCREDITED PROGRAM, or
- By responding correctly to the inspector’s questions as they relate to the specific FOOD operation.

The areas of knowledge must include

- Describing the relation between prevention of foodborne disease and personal hygiene of a FOOD EMPLOYEE.
- Explaining the responsibility of the supervisor or PERSON IN CHARGE to prevent TRANSMISSION of foodborne disease by a FOOD EMPLOYEE who has a disease or medical condition that may cause foodborne disease.

- Describing the symptoms associated with diseases transmissible through FOOD.
- Explaining the significance of the relation between maintaining the time and temperature of POTENTIALLY HAZARDOUS FOOD and the prevention of foodborne illness.
- Explaining the HAZARDS involved in the consumption of raw or undercooked MEAT, POULTRY, eggs, and FISH.
- Stating the required FOOD temperatures and times for safe cooking of POTENTIALLY HAZARDOUS FOOD, including MEAT, POULTRY, eggs, and FISH.
- Stating the required temperatures and times for the safe refrigerated storage, hot holding, cooling, and reheating of POTENTIALLY HAZARDOUS FOOD.
- Describing the relation between prevention of foodborne illness and management and control of the following: CROSS-CONTAMINATION, hand contact with READY-TO-EAT FOODS, handwashing, and maintaining FOOD operations in a clean condition and in good repair.
- Explaining the relation between FOOD safety and providing EQUIPMENT that is sufficient in number and capacity as well as properly designed, constructed, located, installed, operated, maintained, and cleaned.
- Explaining correct procedures for cleaning and sanitizing UTENSILS and FOOD-CONTACT SURFACES of EQUIPMENT.
- Identifying POISONOUS OR TOXIC MATERIALS on the vessel and the procedures necessary to ensure they are safely stored, dispensed, used, and disposed of according to LAW.
- Identifying critical-control points in the operation from purchasing through service that when not controlled may contribute to the TRANSMISSION of foodborne illness and explaining steps taken to ensure the points are controlled in accordance with the guidelines in this manual.

7.2.1.2 Food Safety Duties

7.2.1.2.1 **Monitoring Duties (13 C)**

The supervisor or PERSON IN CHARGE of FOOD operations on the vessel must ensure that

- FOOD operations are not conducted in a room used as living or sleeping quarters.
- Persons unnecessary to the FOOD operation are not allowed in the FOOD PREPARATION, FOOD STORAGE, or WAREWASHING areas. **However, brief**

visits and tours may be authorized if steps are taken to ensure that exposed FOOD; clean EQUIPMENT, UTENSILS, and LINENS; and unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES are protected from CONTAMINATION.

- Employees and other persons such as delivery and maintenance persons and PESTICIDE applicators entering the FOOD PREPARATION, FOOD STORAGE, and WAREWASHING areas comply with the guidelines in this manual.
- FOOD EMPLOYEES are effectively cleaning their hands (by routinely monitoring the employees' handwashing).
- Employees are observing FOODS as they are received to determine that they are from APPROVED sources, delivered at the required temperatures, protected from CONTAMINATION, unadulterated, and accurately presented (by routinely monitoring the employees' observations and periodically evaluating FOODS as they are received).
- Employees are properly cooking POTENTIALLY HAZARDOUS FOOD, being particularly careful in cooking FOODS known to cause severe foodborne illness and death, such as eggs and COMMINUTED MEATS (through daily oversight of the employees' routine monitoring of the cooking temperatures using appropriate properly scaled and calibrated TEMPERATURE-MEASURING DEVICES).
- Employees are using proper methods to rapidly cool POTENTIALLY HAZARDOUS FOODS that are not held hot or are not for consumption within 4 hours (through daily oversight of the employees' routine monitoring of FOOD temperatures during cooling).
- CONSUMERS who order raw or partially cooked READY-TO-EAT FOODS of animal origin are informed that the FOOD is not cooked sufficiently to ensure its safety.
- Employees are properly sanitizing cleaned multiuse EQUIPMENT and UTENSILS before they are reused (through routine monitoring of solution temperature and exposure time for hot water sanitizing, and chemical concentration, pH, temperature, and exposure time for chemical sanitizing).
- CONSUMERS are notified that clean TABLEWARE is to be used when they return to self-service areas such as salad bars and buffets.

- Employees are preventing CROSS-CONTAMINATION of READY-TO-EAT FOOD with bare hands by properly using suitable UTENSILS such as deli tissue, spatulas, tongs, SINGLE-USE gloves, or dispensing EQUIPMENT.
- Employees are properly trained in FOOD safety, including FOOD allergy awareness, as it relates to their assigned duties.
- FOOD EMPLOYEES are informed of their responsibility to report to the supervisor or PERSON IN CHARGE information about their health and activities as they relate to diseases transmissible through FOOD.

7.2.2 Employee Health

7.2.2.1 Communicable Diseases and Symptoms

7.2.2.1.1 **Communicable Diseases (11 C)**

FOOD EMPLOYEES suspected of, diagnosed with, or exposed to any communicable disease caused by *Salmonella typhi*, *Shigella* spp., *E. coli* O157:H7, hepatitis A virus, norovirus, or other communicable diseases that can be transmitted by FOOD, must be excluded from working in any FOOD or FOOD-related areas or operations, including working with exposed FOOD, WAREWASHING, EQUIPMENT, UTENSILS, LINENS, SINGLE-SERVICE ARTICLES, and SINGLE-USE ARTICLES. The excluded individual must not be allowed to return to the above duties until they are symptom free for a minimum of 48 hours.

7.2.2.1.2 **Other Symptoms (11 C)**

FOOD EMPLOYEES who have conditions or symptoms of boils, open sores, infected wounds, diarrhea, jaundice, fever, vomiting, sore throat with fever, or discharges from the nose or mouth must report these conditions or symptoms to the vessel's medical staff and must be restricted from working with exposed FOOD, WAREWASHING, clean EQUIPMENT, UTENSILS, LINENS, and unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.2.2.1.3 **Sneeze/Cough (11 C)**

FOOD EMPLOYEES experiencing persistent sneezing, coughing, or a runny nose that causes discharges from the eyes, nose, or mouth must not work with exposed FOOD; WAREWASHING; clean EQUIPMENT, UTENSILS, and LINENS; or unwrapped SINGLE-SERVICE or SINGLE-USE ARTICLES.

7.2.2.1.4 ***Restrictions Removal (11 C)***

The restriction must not be removed until the supervisor or PERSON IN CHARGE of the FOOD operation obtains written approval from the vessel's physician or equivalent medical staff.

7.2.2.1.5 ***Record of Restriction and Release (02)***

A written or electronic record of both the work restriction and release from restriction must be maintained onboard the vessel for 12 months for inspection review.

7.2.3 **Employee Cleanliness**

7.2.3.1 **Hands and Arms**

7.2.3.1.1 ***Hands and Arms Clean (12 C)***

FOOD EMPLOYEES must keep their hands and exposed portions of their arms clean.

7.2.3.1.2 ***Cleaning Procedures (12 C)***

FOOD EMPLOYEES must clean their hands and exposed portions of their arms with a cleaning compound in a handwashing sink by vigorously rubbing together the surfaces of their lathered hands and arms for at least 20 seconds and thoroughly rinsing with clean water. Employees must pay particular attention to the areas underneath the fingernails and between the fingers.

7.2.3.1.3 ***When to Wash Hands (12 C)***

FOOD EMPLOYEES must clean their hands and exposed portions of their arms immediately before engaging in FOOD preparation, including working with exposed FOOD, clean EQUIPMENT and UTENSILS, and unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES **and**

- After touching bare human body parts other than clean hands and clean, exposed portions of arms.
- After using the toilet room.
- After coughing, sneezing, using a handkerchief or disposable tissue, using tobacco, eating, or drinking.
- After handling soiled EQUIPMENT or UTENSILS.
- During FOOD preparation (as often as necessary to remove soil and CONTAMINATION and to prevent CROSS-CONTAMINATION when changing tasks).
- When switching between working with raw FOOD and working with READY-TO-EAT FOOD.
- Before putting on gloves for working with FOOD or clean EQUIPMENT and between glove changes.

- After engaging in other activities that contaminate the hands.

7.2.3.1.4 Hand Antiseptic (14)

A HAND ANTISEPTIC, a HAND ANTISEPTIC used as a hand dip, or a HAND ANTISEPTIC soap must comply with applicable formulation and use LAWS under FDA 21 CFR 170.39, 178, 182, 184, or 186.

7.2.3.1.5 Apply to Clean Hands (12 C)

HAND ANTISEPTIC, HAND ANTISEPTIC used as a hand dip, or HAND ANTISEPTIC soap must only be applied to hands cleaned as described in section 7.2.3.1.2.

7.2.3.2 Fingernails

7.2.3.2.1 Fingernails (14)

FOOD EMPLOYEES must keep their fingernails trimmed, filed, and maintained so the edges and surfaces are cleanable and not rough.

7.2.3.2.2 Fingernail Polish/Artificial Nails (14)

A FOOD EMPLOYEE must not wear fingernail polish or artificial fingernails when preparing exposed FOOD.

7.2.3.3 Jewelry

7.2.3.3.1 Jewelry (14)

While preparing FOOD, FOOD EMPLOYEES, including bartenders, must not wear jewelry on their arms and hands. **FOOD EMPLOYEES may wear a plain ring such as a SMOOTH simple wedding band.**

7.2.3.4 Food Service Uniform or Apron

7.2.3.4.1 Uniform or Apron (14)

FOOD EMPLOYEES must wear a clean uniform or apron to prevent CONTAMINATION of FOOD, EQUIPMENT, UTENSILS, LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.2.4 Hygienic Practices

7.2.4.1 Eating, Drinking, or Using Tobacco

7.2.4.1.1 *Eating, Drinking, and Using Tobacco (12 C)*

An employee must not eat, drink, or use any form of tobacco in designated areas where the CONTAMINATION of exposed FOOD; clean EQUIPMENT, UTENSILS, and LINENS; unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES; or other items needing protection can occur.

7.2.5.1 Hair Restraints

7.2.5.1.1 *Hair Restraints (14)*

FOOD EMPLOYEES must wear hair restraints—such as hats, hair coverings or nets, beard restraints—and clothing that covers body hair. These items must be designed and worn to effectively keep their hair from contacting exposed FOOD; clean EQUIPMENT, UTENSILS, and LINENS; and unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES.

This applies to partial beards (such as goatees) and to heavy, pronounced mustaches.

This section does not apply to FOOD EMPLOYEES such as counter staff who serve only BEVERAGES and wrapped or PACKAGED FOODS, hostesses, and wait staff if they present a minimal risk for contaminating exposed FOOD; clean EQUIPMENT, UTENSILS, and LINENS; and unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.2.4.3 Toilet Rooms Use (14)

7.2.4.3.1 *Toilet Room Use (Food Employees)*

While in working uniforms, FOOD EMPLOYEES must not use toilet rooms designated for passenger use.

FOOD EMPLOYEES at bars where the only FOOD preparation includes garnish slicing in the pantry and drink making in the pantry and bar are excluded.

7.3 Food

7.3.1 Food Condition

7.3.1.1 Safe and Unadulterated

7.1.1.1.1 Sound Condition (15 C)

FOOD must be safe and unadulterated.

7.3.2 Food Sources

7.3.2.1 Lawful Sourcing

7.3.2.1.1 Comply with Law (15 C)

FOOD must be obtained from sources that comply with applicable local, state, federal, or country of origin's statutes, regulations, and ordinances.

7.3.2.1.2 Food from Private Home (15 C)

FOOD prepared in a private home must not be used or offered for human consumption on a vessel.

7.3.2.1.3 Fish for Undercooked Consumption

FISH—other than MOLLUSCAN SHELLFISH—intended for consumption in their raw form may be served if they are obtained from a supplier that freezes the FISH to destroy parasites or if they are frozen on the vessel and records are retained.

7.3.2.1.4 Steaks (15 C)

WHOLE-MUSCLE, INTACT BEEF steaks intended for consumption in an undercooked form without a CONSUMER advisory must be

- Obtained from a FOOD-PROCESSING PLANT that packages the steaks and labels them to indicate they meet the definition of WHOLE-MUSCLE, INTACT BEEF; **or**
- Cut individually on a vessel from WHOLE-MUSCLE, INTACT BEEF labeled by a FOOD-PROCESSING PLANT to indicate the beef meets the definition of WHOLE-MUSCLE, INTACT BEEF, and prepared so they remain intact.

7.3.2.1.5 Hermetically Sealed Container (15 C)

FOOD in a HERMETICALLY SEALED CONTAINER must be obtained from a FOOD-PROCESSING PLANT regulated by the FOOD regulatory agency that has jurisdiction over the plant.

7.3.2.1.6 Milk (15 C)

Fluid milk and milk products by U.S. suppliers must be obtained from sources that comply with GRADE A STANDARDS as specified in LAW. Milk received in interstate commerce must be from sources listed in the FDA Interstate Milk Shippers List. Non-U.S. sourced fluid milk and milk products must be obtained from sources that meet or exceed the standards of the health authorities from the source country.

7.3.2.1.7 Fish and Molluscan Shellfish Sources (15 C)

FISH received for service must be commercially and legally caught or harvested or otherwise APPROVED for service by VSP through an APPROVED VARIANCE.

Recreationally caught MOLLUSCAN SHELLFISH must not be received for service.

MOLLUSCAN SHELLFISH must be obtained from sources according to LAW and the requirements specified in the FDA National Shellfish Sanitation Program *Guide for the Control of MOLLUSCAN SHELLFISH*, or equivalent standards.

MOLLUSCAN SHELLFISH received in interstate commerce must be from sources listed in the FDA Interstate Certified Shellfish Shippers List or equivalent foreign certified shellfish listing.

7.3.2.1.8 Wild Mushrooms (15 C)

Mushroom species picked in the wild must be obtained from sources where each mushroom is individually inspected and found to be safe by an APPROVED mushroom identification expert.

This requirement does not apply to

- Cultivated wild mushroom species grown, harvested, and processed in an operation regulated by the FOOD regulatory agency that has jurisdiction over the operation.
- Wild mushroom species if they are in PACKAGED form and are the product of a FOOD-PROCESSING PLANT regulated by the FOOD regulatory agency that has jurisdiction over the plant.

7.3.2.1.9 Game Animals (15 C)

If GAME ANIMALS are received for sale or service, they must be

- Commercially raised for FOOD and raised, slaughtered, and processed under LAW; or
- Under a voluntary inspection program administered by USDA for GAME ANIMALS such as exotic animals (reindeer, elk, deer, antelope, water buffalo, or bison)

inspected and APPROVED in accordance with 9 CFR 352 (Voluntary Exotic Animal Program) or rabbits inspected and certified in accordance with 9 CFR 354 (Rabbit Inspection Program); or

- Under an equivalent regulatory program specifically for GAME ANIMALS. The packaging must also be stamped/labeled by the REGULATORY AUTHORITY.

A GAME ANIMAL must not be received for service if it is a species of wildlife listed in 50 CFR 17 Endangered and Threatened Wildlife and Plants.

7.3.2.2 Receiving Condition

7.3.2.2.1 **Receiving Temperatures (16 C)**

Receiving temperatures must be as follows:

- Refrigerated POTENTIALLY HAZARDOUS FOOD must be at a temperature of 5°C (41°F) or below when received. **If a temperature other than 5°C (41°F) for a POTENTIALLY HAZARDOUS FOOD is specified in LAW governing its distribution, such as LAWS governing milk, MOLLUSCAN SHELLFISH, and shell eggs, the FOOD may be received at the specified temperature.**
- POTENTIALLY HAZARDOUS FOOD that is cooked and received hot must be at a temperature of 57°C (135°F) or above.
- A FOOD labeled and shipped frozen by a FOOD-PROCESSING PLANT must be received frozen.
- Upon receipt, POTENTIALLY HAZARDOUS FOOD must be free of evidence of previous temperature abuse.

7.3.2.2.2 **Food Additives (15 C)**

FOOD must not contain unapproved FOOD ADDITIVES or ADDITIVES that exceed amounts specified in LAW, as specified in the current version of the FDA *FOOD Code*, including annexes.

7.3.2.2.3 **Shell Eggs (15 C)**

Shell eggs must be received clean and sound and must not exceed the restricted egg tolerances specified in LAW, as specified in the current version of the FDA *FOOD Code*, including annexes.

7.3.2.2.4 **Egg and Milk Products (15 C)**

Eggs and milk products must be received as follows:

- Liquid, frozen, and dry eggs and egg products must be obtained pasteurized.

- Fluid and dry milk and milk products complying with GRADE A STANDARDS as specified in LAW must be obtained pasteurized.
- Frozen milk products, such as ice cream, must be obtained pasteurized as specified in 21 CFR 135 Frozen Desserts.
- Cheese must be obtained pasteurized unless alternative procedures to pasteurization are specified in the CFR, such as 21 CFR 133 Cheeses and Related Cheese Products for curing certain cheese varieties.

7.3.2.2.5 *Package Integrity (15 C)*

FOOD packages must be in good condition and protect the integrity of the contents so the FOOD is not exposed to adulteration or potential contaminants. Canned goods with dents on end or side SEAMS must not be used.

7.3.2.2.6 *Ice (15 C)*

Ice for use as a FOOD or a cooling medium must be made from DRINKING WATER.

7.3.2.2.7 *Shucked Shellfish (15 C)*

Raw SHUCKED SHELLFISH must be obtained in nonreturnable packages that bear a legible label as specified in the FDA National Shellfish Sanitation Program *Guide for the Control of MOLLUSCAN SHELLFISH*.

7.3.2.2.8 *Shellstock Shellfish (15 C)*

SHELLSTOCK must be obtained in containers bearing legible source identification tags or labels affixed by the harvester and by each dealer that depurates (cleanses), ships, or reships the SHELLSTOCK, as specified in the National Shellfish Sanitation Program *Guide for the Control of MOLLUSCAN SHELLFISH*.

7.3.2.2.9 *Shellstock Condition (19)*

SHELLSTOCK must be reasonably free of mud, dead shellfish, and shellfish with broken shells when received by a vessel. Dead shellfish or SHELLSTOCK with badly broken shells must be discarded.

7.3.2.3 Maintaining Molluscan Shellfish Identification

7.3.2.3.1 *Shucked Identification (15 C)*

Shucked MOLLUSCAN SHELLFISH must not be removed from the container in which they are received other than immediately before preparation for service.

7.3.2.3.2 Shellstock Identification (15 C)

SHELLSTOCK shellfish tags must

- Remain attached to the container in which the SHELLSTOCK are received until the container is empty.
- Be maintained by retaining SHELLSTOCK tags or labels for 90 calendar days from the date the container is emptied by using an APPROVED record-keeping system that keeps the tags or labels in chronologic order correlated to the date when the SHELLSTOCK are served. The date when the last SHELLSTOCK from the container is served must be recorded on the tag or label.

7.3.3 Food Protection

7.3.3.1 Employee Contamination

7.3.3.1.1 Wash Hands (12 C)

FOOD EMPLOYEES must wash their hands.

7.3.3.1.2 RTE Food – Hand Contact Prohibited (12 C)

Except when washing fruits and vegetables or when otherwise APPROVED, FOOD EMPLOYEES must not contact exposed, READY-TO-EAT FOOD with their bare hands. They must use suitable UTENSILS such as deli tissue, spatulas, tongs, SINGLE-USE gloves, or dispensing EQUIPMENT.

7.3.3.1.3 Not RTE Food – Minimize Contact (19)

FOOD EMPLOYEES must minimize bare hand and arm contact with exposed FOOD not in a READY-TO-EAT form.

7.3.3.1.4 Tasting (12 C)

A FOOD EMPLOYEE must not use the same UTENSIL more than once to taste FOOD that will be served.

7.3.3.2 Food and Ingredient Contamination

7.3.3.2.1 Cross-Contamination (18 C)

FOOD must be protected from cross-CONTAMINATION or other sources of CONTAMINATION by the following methods:

- Physically separating raw animal FOODS during storage, preparation, holding, and display from raw READY-TO-EAT FOOD (including other raw animal FOOD such as FISH for sushi or MOLLUSCAN SHELLFISH, or other raw READY-TO-EAT FOOD such as vegetables, and cooked READY-TO-EAT FOOD) so products do not

physically touch and so that one product does not drip into another.

- Separating types of raw animal FOODS such as beef, FISH, lamb, pork, and POULTRY from each other—except when combined as ingredients—during storage, preparation, holding, and display by using separate EQUIPMENT for each type, or by arranging each type of FOOD in EQUIPMENT so that CROSS-CONTAMINATION of one type with another is prevented, or by preparing each type of FOOD at different times or in separate areas. **Frozen, commercially processed and PACKAGED raw animal FOOD may be stored or displayed with or above frozen, commercially processed and PACKAGED, READY-TO-EAT FOOD.**
- Cleaning and sanitizing EQUIPMENT and UTENSILS.
- Storing the FOOD in packages, covered containers, or wrappings.
- Cleaning visible soil on HERMETICALLY SEALED CONTAINERS of FOOD before opening.
- Protecting FOOD containers that are received PACKAGED together in a case or overwrapped from cuts when the case or overwrap is opened.
- Separating damaged, spoiled, or recalled FOOD being held on the vessel.
- Separating unwashed fruits and vegetables from READY-TO-EAT FOOD.

Storage exceptions: Storing the FOOD in packages, covered containers, or wrappings does not apply to

- **Whole, uncut, raw fruits and vegetables and nuts in the shell that require peeling or hulling before consumption.**
- **PRIMAL CUTS, quarters, or sides of raw MEAT or slab bacon hung on clean, sanitized hooks or placed on clean, sanitized racks.**
- **Whole, uncut, processed MEATS such as country hams, and smoked or cured sausages placed on clean, sanitized racks.**
- **FOOD being cooled.**
- **SHELLSTOCK.**

7.3.3.2.2 Container Identity (19)

Containers holding FOOD or FOOD ingredients removed from their original packages for use on the vessel, such as cooking oils, flour, herbs, potato flakes, salt, spices, and sugar must be identified with the common name of the FOOD.

Containers holding FOOD that can be readily and unmistakably recognized such as dry pasta do not need to be identified.

Ingredients located at active cooking or preparation stations do not need to be identified.

7.3.3.2.3 Pasteurized Eggs (18 C)

Pasteurized eggs or egg products must be substituted for raw shell eggs in the preparation of FOODS such as Caesar salad, hollandaise or béarnaise sauce mayonnaise, eggnog, ice cream, and egg-fortified BEVERAGES or dessert items that are not cooked.

7.3.3.2.4 Wash Fruits/Vegetables (19)

Raw fruits and vegetables must be thoroughly rinsed in water to remove soil and other contaminants before being cut, combined with other ingredients, cooked, served, or offered for human consumption in READY-TO-EAT form.

7.3.3.2.5 Vegetable Washes

Fruits and vegetables may be washed by using chemicals specified under 21 CFR 173.315 (Annex 13.12).

7.3.3.3 Ice as Coolant

7.3.3.3.1 Ice Used as a Coolant (19)

Ice must not be used as FOOD after use as a medium for cooling the exterior surfaces of FOOD such as melons or FISH, PACKAGED FOODS such as canned BEVERAGES, or cooling coils and tubes of EQUIPMENT.

7.3.3.3.2 Coolant (19)

PACKAGED FOOD must not be stored in direct contact with ice or water if the FOOD is subject to the entry of water because of the nature of its packaging, wrapping, or container, or its positioning in the ice or water.

7.3.3.3.3 Undrained Ice (19)

Except as specified in 7.3.3.3.4 through 7.3.3.3.6, unpackaged FOOD must not be stored in direct contact with undrained ice.

7.3.3.3.4 Raw Fruit/Vegetables

Whole, raw fruits or vegetables; cut, raw vegetables such as celery, carrot sticks, or cut potatoes; and tofu may be immersed in ice or water.

7.3.3.3.5 Raw Chicken/Fish

Raw chicken and raw FISH received immersed in ice in shipping containers may remain in that condition while in storage awaiting preparation, display, or service.

7.3.3.3.6 Ongoing Meal Service

Other unpackaged FOODS in a raw, cooked, or partially cooked state may be immersed in ice as part of an ongoing meal service process, such as liquid egg product, individual eggs, pasta, and reconstituted powdered mixes.

7.3.3.4 Equipment, Utensils, and Linens

7.3.3.4.1 Cleaned/Sanitized (26 C)

FOOD must only contact surfaces of cleaned and sanitized EQUIPMENT and UTENSILS.

7.3.3.4.2 Storage During Use (19)

During pauses in FOOD preparation or dispensing, FOOD preparation and dispensing UTENSILS must be stored in one of the following ways:

- In the FOOD with their handles above the top of the FOOD and the container.
- In FOOD that is not POTENTIALLY HAZARDOUS with their handles above the top of the FOOD within containers or EQUIPMENT that can be closed, such as bins of sugar, flour, or cinnamon.
- On a clean portion of the FOOD preparation table or cooking EQUIPMENT only if the in-use UTENSIL and the FOOD-CONTACT SURFACE of the FOOD preparation table or cooking EQUIPMENT are cleaned and sanitized at least every 4 hours.
- In running water of sufficient velocity to flush particulates to the drain (if used with moist FOOD such as ice cream or mashed potatoes).
- In a clean, protected location (if the UTENSILS, such as ice scoops, are used only with a FOOD that is not POTENTIALLY HAZARDOUS).
- In a container of water (if the water is maintained at a temperature of at least 57°C [135°F] and the container is frequently cleaned and sanitized).

7.3.3.4.3 Linen/Napkins (19)

LINENS and napkins must not be used in contact with FOOD unless they are used to line a container for the service of FOODS and the LINENS and napkins are replaced each time the container is refilled for a new CONSUMER.

7.3.3.4.4 Wiping Cloths (25)

Wiping cloths must be restricted to the following:

- Cloths used for wiping FOOD spills must be used for no other purpose.
- Cloths used for wiping FOOD spills must be dry and used for wiping FOOD spills from TABLEWARE and SINGLE-SERVICE ARTICLES **OR** wet and cleaned, stored in a chemical SANITIZER, and used for wiping spills from FOOD-CONTACT and NONFOOD-CONTACT SURFACES of EQUIPMENT.
- Dry or wet cloths used with raw animal FOODS must be kept separate from cloths used for other purposes. Wet cloths used with raw animal FOODS must be kept in a separate sanitizing solution.
- Wet wiping cloths used with a freshly made sanitizing solution and dry wiping cloths must be free of FOOD debris and visible soil.

7.3.3.4.5 Glove Use (19)

Gloves must be used as follows:

- SINGLE-USE gloves must be used for only **one hand-contact** task with READY-TO-EAT FOOD and no other purpose. These SINGLE-USE gloves must be discarded when damaged or soiled or when operation is interrupted.
- Slash-resistant gloves used to protect hands during operations requiring cutting must be used in direct contact only with FOOD that is subsequently cooked (such as frozen FOOD or a PRIMAL CUT of MEAT).
- Slash-resistant gloves may be used with READY-TO-EAT FOOD that will not be subsequently cooked if the slash-resistant gloves have a SMOOTH, durable, and nonabsorbent outer surface **or** if the slash-resistant gloves are covered with a SMOOTH, durable, nonabsorbent glove or a SINGLE-USE glove.
- Cloth gloves must not be used in direct contact with FOOD unless the FOOD is subsequently cooked (such as frozen FOOD or a PRIMAL CUT of MEAT).

7.3.3.4.6 Second Portions and Refills (19)

Procedures for second portions and refills must be as follows:

- FOOD EMPLOYEES must not use TABLEWARE soiled by the CONSUMER—including SINGLE-SERVICE ARTICLES—except for refilling a CONSUMER’S drinking cup or container without contact between the pouring UTENSIL and the lip-contact area of the drinking cup or container.
- Self-service CONSUMERS must not be allowed to use soiled TABLEWARE—including SINGLE-SERVICE ARTICLES—to obtain additional FOOD from the display and serving EQUIPMENT except as specified in the bullet below.
- **Self-service CONSUMERS may reuse drinking cups and containers if refilling is a CONTAMINATION-free process.**

7.3.3.5 Food Storage and Preparation

This section applies to storage of candy and other FOOD items sold in candy shops, including self-service candy shops and shops where candy is served by a crew member.

7.3.3.5.1 Storage Protection (19)

FOOD must be protected from CONTAMINATION by storing it as follows:

- Covered or otherwise protected;
- In a clean, dry location;
- Where it is not exposed to splash, dust, or other CONTAMINATION; and
- At least 150 millimeters (6 inches) above the deck. FOOD in packages and working containers on pallets, skids, and racks may be 127 millimeters (5 inches) above the deck. Shelving units must be 150 millimeters (6 inches) above the deck.

7.3.3.5.2 Prohibited Storage (19)

FOOD must not be stored as follows:

- In locker rooms.
- In toilet rooms.
- In dressing rooms.
- In garbage rooms.
- In mechanical rooms.
- Under sewer lines that are not continuously sleeve welded.
- Under leaking water lines, including leaking automatic fire sprinkler heads, or under lines on which water has

condensed.

- Under open stairwells.
- Under other sources of CONTAMINATION from nonfood items such as ice blocks, ice carvings, and flowers.
- In areas not finished in accordance with 7.7.5 and 7.7.6 for FOOD STORAGE AREAS.

7.3.3.5.3 Potentially Hazardous Food Packages in Vending Machines (19)

POTENTIALLY HAZARDOUS FOOD dispensed through a vending machine must be in the package in which it was placed in the galley or FOOD-PROCESSING PLANT at which it was prepared.

7.3.3.5.4 Preparation (19)

During preparation, unpackaged FOOD must be protected from environmental sources of CONTAMINATION such as rain.

7.3.3.6 Food Display and Service

This section applies to self-service candy shops where customers serve themselves from candy displays or dispensers.

7.3.3.6.1 Display Preparation (19)

FOOD on display must be protected from CONTAMINATION by the use of packaging; counter, service line, or salad bar FOOD guards; display cases; self-closing hinged lids; or other effective means. Install side protection for sneeze guards if the distance between exposed FOOD and where CONSUMERS are expected to stand is less than 1 meter (40 inches).

7.3.3.6.2 Condiments (19)

Condiments must be protected from CONTAMINATION by being kept in one of the following:

- Dispensers designed to provide protection.
- Protected FOOD DISPLAYS provided with the proper UTENSILS.
- Original containers designed for dispensing.
- Individual packages or portions.

Condiments at a vending machine location must be in individual packages or provided in dispensers that are filled at an APPROVED location, such as the galley that provides FOOD to the vending machine location, a FOOD-PROCESSING PLANT, or a properly equipped facility located on the site of the vending machine location.

7.3.3.6.3 Self Service (19)

CONSUMER self-service operations, such as salad bars and buffets, for unpackaged READY-TO-EAT FOODS must be

- Provided with suitable UTENSILS or effective dispensing methods that protect the FOOD from CONTAMINATION.
- Monitored by FOOD EMPLOYEES trained in safe operating procedures.

Where there is self-service of scooped frozen dessert, service must be out of shallow pans no deeper than 4 inches (100 millimeters) and no longer than 12 inches (300 millimeters).

7.3.3.6.4 Utensils, Consumer Self-service

7.3.3.6.4.1 Dispensing Utensil (19)

A FOOD-dispensing UTENSIL must be available for each container of FOOD displayed at a CONSUMER self-service unit such as a buffet or salad bar.

7.3.3.6.4.2 Utensil Protected (19)

The FOOD contact portion of each self-service FOOD-dispensing UTENSIL must be covered or located beneath shielding during service.

Dishware, glassware, and UTENSILS out for service must be inverted or covered.

7.3.3.6.5 Food Reservice (15 C)

After being served and in the possession of a CONSUMER or being placed on a buffet service line, FOOD that is unused or returned by the CONSUMER must not be offered as FOOD for human consumption.

Exceptions:

- **A container of FOOD that is not POTENTIALLY HAZARDOUS may be transferred from one CONSUMER to another if the FOOD is dispensed so that it is protected from CONTAMINATION and the container is closed between uses (such as a narrow-neck bottle containing catsup, steak sauce, or wine) OR the FOOD (such as crackers, salt, or pepper) is in an unopened original package and is maintained in sound condition.**
- **Reservice for FOODS served to passengers from a fully enclosed display case and under strict employee monitoring, strict temperature control of hot/cold POTENTIALLY HAZARDOUS FOODS, proper cooling and reheating of hot-held POTENTIALLY**

HAZARDOUS FOODS, and complete protection from any other CONTAMINATION sources, including pests.

7.3.3.7 Other Contamination

7.3.3.7.1 Other Contaminants (19)

FOOD must be protected from CONTAMINATION that may result from a physical, chemical, biological origin.

7.3.4 Pathogen Destruction

7.3.4.1 Cooking Temperatures/Times

7.3.4.1.1 Cooking (16 C)

Raw animal FOODS such as eggs, FISH, MEAT, and POULTRY—and FOODS containing these raw animal FOODS—must be cooked to heat all parts of the FOOD to a temperature and for a time that complies with one of the following methods based on the FOOD being cooked:

- **63°C (145°F) or above** for 15 seconds for
 - Raw shell eggs broken and prepared in response to CONSUMERS' orders and for immediate service.
 - FISH, MEAT, and pork, including GAME ANIMALS commercially raised for FOOD and GAME ANIMALS under a voluntary inspection program.
- **68°C (155°F) or above** for 15 seconds or equivalent temperature-time combination for
 - RATITES, MECHANICALLY TENDERIZED and INJECTED MEATS, and raw eggs not prepared for immediate service.
 - COMMINUTED FISH, MEAT, GAME ANIMALS commercially raised for FOOD, and GAME ANIMALS under a voluntary inspection program.
- **74°C (165°F) or above** for 15 seconds for
 - POULTRY.
 - Wild GAME ANIMALS not specified in above bullet for 68°C (155°F).
 - Stuffed FISH, MEAT, pasta, POULTRY, or RATITES.
 - Stuffing containing FISH, MEAT, POULTRY, or RATITES.

- Whole beef roasts, corned beef roasts, pork roasts, and cured pork roasts such as ham, must be cooked as detailed in sections a and b below.

- a. Food cooked in an oven preheated to the temperature specified below for the roast's weight and oven type AND

Oven Type	Roast Weight Less Than 4.5 kg (10 lbs)	Roast Weight 4.5 kg (10 lbs) or More
Still dry	Preheat to 177°C (350°F) or more	Preheat to 121°C (250°F) or more
Convection	Preheat to 163°C (325°F) or more	Preheat to 121°C (250°F) or more
High humidity*	Preheat to 121°C (250°F)	Preheat to 121°C (250°F)

*Relative humidity greater than 90% for at least 1 hour as measured in the cooking chamber or exit of the oven or in a moisture-impermeable bag that provides 100% humidity.

- b. All parts of the FOOD heated to a temperature and for the holding time corresponding to that temperature:

Temperature	Time*
54.4°C (130°F)	112 minutes
55.0°C (131°F)	89 minutes
56.1°C (133°F)	56 minutes
57.2°C (135°F)	36 minutes
57.8°C (136°F)	28 minutes
58.9°C (138°F)	18 minutes
60.0°C (140°F)	12 minutes
61.1°C (142°F)	8 minutes
62.2°C (144°F)	5 minutes
62.8°C (145°F)	4 minutes
63.9°C (147°F)	134 seconds
65.0°C (149°F)	85 seconds
66.1°C (151°F)	54 seconds
67.2°C (153°F)	34 seconds
68.3°C (155°F)	22 seconds
69.4°C (157°F)	14 seconds
70.0°C (158°F)	0 seconds

*Holding time may include postoven heat rise. Extracted from *FOOD Code*, Recommendations of the United States Public Health Service, 2013.

- **A raw or undercooked WHOLE-MUSCLE, INTACT BEEF steak may be served or offered for sale in a READY-TO-EAT form if the steak is labeled to indicate**

that it meets the definition of “WHOLE-MUSCLE, INTACT BEEF” and the steak is cooked on both the top and bottom to a surface temperature of 63°C (145°F) or above and a cooked color change is achieved on all external surfaces.

- A raw animal FOOD (such as raw FISH, raw-marinated FISH, raw MOLLUSCAN SHELLFISH, or steak tartare) or a partially cooked FOOD (such as lightly cooked FISH, soft-cooked eggs, or rare MEAT other than WHOLE-MUSCLE, INTACT BEEF steaks) may be served or offered for sale in a READY-TO-EAT form if the CONSUMER is informed by the written CONSUMER advisory or if VSP grants a VARIANCE from the cooking recommendations based on a HACCP PLAN submitted by the vessel. The HACCP PLAN must document scientific data or other information showing that a lesser time and temperature regimen results in a safe FOOD. The HACCP PLAN must verify that EQUIPMENT and procedures for FOOD preparation and training of FOOD EMPLOYEES meet the conditions of the VARIANCE.

7.3.4.1.2 *Microwave (16 C)*

Raw animal FOODS cooked in a microwave oven must be

- Rotated or stirred throughout or midway during cooking to compensate for uneven distribution of heat.
- Covered to retain surface moisture.
- Heated to a temperature of at least 74°C (165°F) in all parts of the FOOD.
- Allowed to stand covered for 2 minutes after cooking to obtain temperature equilibrium.

7.3.4.1.3 *Fruits/Vegetables (17)*

Fruits and vegetables cooked for hot holding must be cooked to a temperature of 57°C (135°F).

7.3.4.2 Parasite Destruction

7.3.4.2.1 *Parasite Destruction (16 C)*

Before service in READY-TO-EAT form, raw, raw-marinated, partially cooked, or marinated-partially cooked FISH and fishery products other than MOLLUSCAN SHELLFISH must be frozen throughout to a temperature of -20°C (-4°F) or below for 168 hours (7 days) in a freezer or to -35°C (-31°F) or below for 15 hours in a BLAST CHILLER.

These FISH may be served in a raw, raw-marinated, or partially cooked READY-TO-EAT form without freezing if the

- **FISH are tuna of the species *Thunnus alalunga*, *T. albacares* (yellowfin tuna), *T. atlanticus*, *T. maccoyii* (bluefin tuna, southern), *T. obesus* (bigeye tuna), or *T. thynnus* (bluefin tuna, northern) OR**
- **Aquacultured FISH, such as salmon, are**
 - **raised in open water, net-pens, or land-based operations such as ponds or tanks and**
 - **fed formulated feed (such as pellets) that contains no live parasites infective to the aquacultured.**
- **FISH eggs have been removed from the skein and rinsed.**

If FOODS, such as gravlax, ceviche/seviche, FISH carpaccio, or sashimi, are prepared in a FOOD-PROCESSING PLANT and certified as parasite free, they may be served raw, raw-marinated, or partially cooked READY-TO-EAT without freezing the product onboard the vessel.

7.3.4.2.2 Records (17)

If raw, raw-marinated, partially cooked, or marinated partially cooked FISH are served in READY-TO-EAT form,

- The supervisor or PERSON IN CHARGE must record the freezing temperature and time to which the FISH are subjected and must retain the records on the vessel for 90 calendar days beyond the time of service or sale of the FISH; OR
- If the FISH are frozen by a supplier, a written letter from the supplier must specify the FISH species involved and both the temperature to which the FISH was frozen and the total time period at that temperature. If the supplier provides any of the same FISH species to the vessel in a fresh state, the outer packaging must designate which one is the parasite-free FISH.

For FISH exempt from freezing requirements based on section 7.3.4.2.1, a written letter from the supplier must state both the species of FISH and the conditions in which they were raised and fed.

7.3.4.3 Reheating

7.3.4.3.1 *Immediate Service*

Cooked and refrigerated FOOD prepared for immediate service in response to an individual CONSUMER order (such as a roast beef sandwich au jus) may be served at any temperature.

7.3.4.3.2 *74°C/165°F (16 C)*

POTENTIALLY HAZARDOUS FOOD that is cooked, cooled, and reheated for hot holding must be reheated so that all parts of the FOOD reach a temperature of at least 74°C (165°F) for 15 seconds.

7.3.4.3.3 *Microwave Heating (16 C)*

If reheated in a microwave oven for hot holding, POTENTIALLY HAZARDOUS FOOD must be reheated so that all parts of the FOOD reach a temperature of at least 74°C (165°F) and the FOOD is rotated or stirred, covered, and allowed to stand covered for 2 minutes after reheating.

7.3.4.3.4 *Commercial Products (17)*

READY-TO-EAT POTENTIALLY HAZARDOUS FOOD taken from a commercially processed, HERMETICALLY SEALED CONTAINER, or from an intact package from a FOOD-PROCESSING PLANT inspected by the FOOD REGULATORY AUTHORITY that has jurisdiction over the plant, must be heated to a temperature of at least 57°C (135°F) for hot holding.

7.3.4.3.5 *Rapid Reheat (16 C)*

Reheating for hot holding must be done rapidly. The time the FOOD is between 5°C (41°F) and 74°C (165°F) must not exceed 2 hours.

7.3.4.3.6 *Reheat Roast Beef*

Remaining unsliced portions of roasts of beef cooked on the vessel may be reheated for hot holding using the oven parameters and minimum time and temperature conditions used in the original cooking process.

7.3.5 Food Holding Temperatures and Times

7.3.5.1 Frozen, Slacking, and Thawing Procedures

7.3.5.1.1 *Store Frozen Food Frozen (17)*

Stored frozen FOODS must be maintained frozen.

7.3.5.1.2 Slacking (17)

Frozen POTENTIALLY HAZARDOUS FOOD that is SLACKED to moderate the temperature must be held

- Under refrigeration that maintains the FOOD temperature at 5°C (41°F) or less; or
- At any temperature if the FOOD remains frozen.

7.3.5.1.3 Thawing (17)

POTENTIALLY HAZARDOUS FOOD must be thawed by one of the following:

- Under refrigeration that maintains the FOOD temperature at 5°C (41°F) or less.
- Completely submerged under running water at a water temperature of 21°C (70°F) or below, with sufficient water velocity to agitate and float off loose particles in an overflow, and for a period of time that does not allow thawed portions of READY-TO-EAT FOOD to rise above 5°C (41°F).
- Completely submerged under running water at a water temperature of 21°C (70°F) or below with sufficient water velocity to agitate and float off loose particles in an overflow and for a period of time that does not allow thawed portions of a raw animal FOOD requiring cooking to be above 5°C (41°F) for more than 4 hours, including
 - The time the FOOD is exposed to the running water and the time needed for preparation for cooking, OR
 - The time it takes under refrigeration to lower the FOOD temperature to 5°C (41°F).
- As part of a cooking process if the frozen FOOD is cooked or thawed in a microwave oven.

If a portion of frozen READY-TO-EAT FOOD is thawed and prepared for immediate service in response to an individual CONSUMER'S order, it can be thawed using any procedure.

7.3.5.2 Food Cooling

7.3.5.2.1 Cooling Times/Temperatures (16 C)

Cooked POTENTIALLY HAZARDOUS FOOD must be cooled

- From 57°C (135°F) to 21°C (70°F) within 2 hours and
- From 21°C (70°F) to 5°C (41°F) or less within 4 hours.

7.3.5.2.2 Cooling Prepared Food (16 C)

POTENTIALLY HAZARDOUS FOOD must be cooled within 4 hours to 5°C (41°F) or less if prepared from ingredients at ambient temperature (such as reconstituted FOODS and canned tuna).

7.3.5.2.3 Cooling Received Food (16 C)

A POTENTIALLY HAZARDOUS FOOD received in compliance with LAWS allowing a temperature above 5°C (41°F) during shipment from the supplier must be cooled within 4 hours to 5°C (41°F) or less.

7.3.5.2.4 Shell Eggs

Shell eggs need not comply with the cooling time if, on receipt, they are placed immediately into refrigerated EQUIPMENT capable of maintaining FOOD at 5°C (41°F) or less.

7.3.5.2.5 Cooling Methods (17)

Cooling must be accomplished using one or more of the following methods based on the type of FOOD being cooled:

- Placing the FOOD in shallow pans.
- Separating the FOOD into smaller or thinner portions.
- Using BLAST CHILLERS, freezers, or other rapid cooling EQUIPMENT.
- Stirring the FOOD in a container placed in an ice water bath.
- Using containers that facilitate heat transfer.
- Adding ice as an ingredient.
- Using other effective methods.

When placed in cooling or cold-holding EQUIPMENT, FOOD containers in which FOOD is being cooled must be arranged in the EQUIPMENT to provide maximum heat transfer through the container walls and must be loosely covered—or uncovered if protected from overhead CONTAMINATION—during the cooling period to facilitate heat transfer from the surface of the FOOD.

7.3.5.2.6 Cooling Logs (17)

Logs documenting cooked POTENTIALLY HAZARDOUS FOOD cooling temperatures and times from the starting points designated in 7.3.5.2.1 through the control points at 2 and 6 hours must be maintained onboard the vessel for a period of 30 days from the date the FOOD was placed in a cooling process. Logs documenting cooling of POTENTIALLY HAZARDOUS FOODS prepared from ingredients at ambient temperatures, with the start time to the time

when 5°C (41°F) is reached, must also be maintained for a 30-day period beginning with the day of preparation.

7.3.5.3 Food Holding Temperatures and Times

7.3.5.3.1 Holding Temperature/Time (16 C)

Except during preparation, cooking, or cooling, or when time is used as the public health control, POTENTIALLY HAZARDOUS FOOD must be maintained at

- 57°C (135°F) or above, except that roasts may be held at a temperature of 54°C (130°F); or
- 5°C (41°F) or less.

7.3.5.3.2 RTE PHF Shelf-Life: Date Marking (16 C)

Refrigerated, READY-TO-EAT, POTENTIALLY HAZARDOUS FOOD

- Prepared on a vessel and held refrigerated for more than 24 hours must be clearly marked at the time of preparation to indicate the date or day by which the FOOD must be consumed (7 calendar days or fewer from the day the FOOD is prepared). The day of preparation is counted as day 1.
- Prepared and PACKAGED by a FOOD-PROCESSING PLANT and held on the vessel after opening for more than 24 hours must be clearly marked at the time the original container is opened to indicate the date by which the FOOD must be consumed (7 calendar days or fewer after the original container is opened). The day of package opening is counted as day 1.

The date marking requirement can be accomplished with a calendar date, day of the week, color-code, or other system, provided it is effective.

The date marking requirement does not apply to the following FOODS prepared and PACKAGED by a FOOD-PROCESSING PLANT inspected by a REGULATORY AUTHORITY:

- Deli salads (such as ham salad, seafood salad, chicken salad, egg salad, pasta salad, potato salad, and macaroni salad) manufactured in accordance with 21 CFR 110.
- Hard cheeses containing not more than 39% moisture as defined in 21 CFR 133 (such as cheddar, gruyere, parmesan and reggiano, and romano).

- Semisoft cheeses containing more than 39% moisture but not more than 50% moisture, as defined in 21 CFR 133 (such as blue, edam, gorgonzola, gouda, and monterey jack).
- Cultured dairy products as defined in 21 CFR 131 (such as yogurt, sour cream, and buttermilk).
- Preserved FISH products (such as pickled herring and dried or salted cod) and other acidified FISH products defined in 21 CFR 114.
- Shelf stable, dry fermented sausages (such as pepperoni and Genoa salami) not labeled “keep refrigerated” as specified in 9 CFR 317. [Retain the original casing on the product.]
- Shelf stable salt-cured products (such as prosciutto and Parma [ham]) not labeled “keep refrigerated” as specified in 9 CFR 317.

These products are exempted from date marking even after being opened, cut, shredded, etc.

7.3.5.3.3 *Discarding RTE PHF (16 C)*

Refrigerated, READY-TO-EAT, POTENTIALLY HAZARDOUS FOOD must be discarded if not consumed within 7 calendar days from the date of preparation or opening.

7.3.5.3.4 *Retain Date (16 C)*

A refrigerated, potentially hazardous, READY-TO-EAT FOOD ingredient or a portion of a refrigerated, potentially hazardous, READY-TO-EAT FOOD subsequently combined with additional ingredients or portions of FOOD must retain the date marking of the earliest or first-prepared ingredient.

7.3.5.3.5 *Time as a Public Health Control (16 C)*

If time only—rather than time in conjunction with temperature—is used as the public health control for a working supply of POTENTIALLY HAZARDOUS FOOD before cooking, or for READY-TO-EAT POTENTIALLY HAZARDOUS FOOD that is displayed or held for service for immediate consumption, the FOOD

- Must have an initial temperature of 5°C (41°F) or less or 57°C (135°F) or greater before placement on time control.
- Must not be placed on temperature control again.
- Must be marked or otherwise identified to indicate the time 4 hours past the point in time when the FOOD is removed from temperature control (if the time between service set-up and closing is greater than 4 hours).

- Must be discarded within 4 hours of placement on time control.
 - If FOOD is on/in a time control unit (bain marie, cold basin, soup wells) and service is under 4 hours, a 4-hour discard label is not needed.
 - If the time control unit meant to be cold holding or hot holding is not operational or used as intended, the unit is considered a counter and the FOOD stored within it must be labeled with its 4-hour discard time.
 - Containers of POTENTIALLY HAZARDOUS FOOD under time control and placed on preparation counters must be labeled with the discard time, even if the outlet is open less than 4 hours.

EQUIPMENT that does not have cabinets or compartments does not need to be labeled as time control. Such EQUIPMENT includes bains marie, cold tops, and soup wells.

7.3.5.3.6 Time Control Plan (17)

A written time control plan(s) that ensures compliance with these guidelines must be maintained on the vessel and made available for review during inspections (Annex 13.13). A time control plan must be posted and ACCESSIBLE to all crew working at each outlet where time control is used.

The plan(s) must

- Include set-up and discard times for each outlet. Include all services and events where POTENTIALLY HAZARDOUS FOODS are kept on time control. If used, colored labels must correspond to the discard times stated in the plan.
- List all units (to include preparation counters, cabinets, compartments, and EQUIPMENT) on time control.
- Describe or show the flow of POTENTIALLY HAZARDOUS FOOD from when last in temperature control to placement in time control and discard.

7.3.6 Consumer Information

7.3.6.1 Consumer Advisory

7.3.6.1.1 Raw Shell Egg Preparations (16 C)

Raw shell egg preparations are prohibited in uncooked products as described in 7.3.3.2.3.

7.3.6.1.2 Animal Food (16 C)

If an animal FOOD such as beef, eggs, FISH, lamb, milk, pork, POULTRY, or shellfish that is raw, undercooked, or not otherwise processed to eliminate pathogens is offered in a READY-TO-EAT form or as a raw ingredient in another READY-TO-EAT FOOD, the CONSUMER must be informed by way of disclosure as specified below using menu advisories, placards, or other easily visible written means of the significantly increased risk to certain especially vulnerable CONSUMERS eating such FOODS in raw or undercooked form. The advisory must be located at the outlets where these types of FOOD are served.

Disclosure must be made by one of the two following methods:

- On a sign describing the animal-derived FOODS (e.g., “oysters on the half-shell,” “hamburgers,” “steaks,” or “eggs”) AND that they can be cooked to order **or** may be served raw or undercooked AND a statement indicating that consuming raw or undercooked MEATS, seafood, shellfish, eggs, milk, or POULTRY may increase your risk for foodborne illness, especially if you have certain medical conditions. The advisory must be posted at the specific station where the FOOD is served raw, undercooked, or cooked to order.

OR

- On a menu using an asterisk at the animal-derived FOODS requiring disclosure and a footnote with a statement indicating that consuming raw or undercooked MEATS, seafood, shellfish, eggs, milk, or POULTRY may increase your risk for foodborne illness, especially if you have certain medical conditions.

It is acceptable to limit the list of animal-derived FOODS in the CONSUMER advisory to only the type(s) of animal-derived FOOD served raw, undercooked, or cooked to order at a specific location. For example, at a sushi counter, the CONSUMER advisory might only refer to seafood.

A CONSUMER advisory is not required for raw or undercooked WHOLE-MUSCLE, INTACT BEEF steak as specified under 7.3.2.1.4.

7.3.7 Contaminated Food

7.3.7.1 Discarding Food

7.3.7.1.1 *Unsafe/Adulterated (18 C)*

A FOOD that is unsafe or ADULTERATED must be discarded.

7.3.7.1.2 *Unapproved Source (18 C)*

FOOD that is not from an APPROVED source must be discarded.

7.3.7.1.3 *Restricted or Excluded Employee (18 C)*

READY-TO-EAT FOOD that may have been contaminated by an employee who has been restricted or excluded for FOOD EMPLOYEE health issues must be discarded.

7.3.7.1.4 *Contaminated by Others (18 C)*

FOOD that is contaminated by FOOD EMPLOYEES, CONSUMERS, or other persons through contact with their hands, bodily discharges (such as nasal or oral discharges), or other means must be discarded.

7.4 Equipment and Utensils

7.4.1 Materials

7.4.1.1 Multiuse Characteristics and Use Limitations

7.4.1.1.1 *Safe Food-Contact Materials (26 C)*

Materials used in the construction of multiuse UTENSILS and FOOD-CONTACT SURFACES of EQUIPMENT must not allow the migration of deleterious substances or impart colors, odors, or tastes to FOOD and must be safe under normal use conditions.

7.4.1.1.2 *Food-Contact Surfaces (20)*

Materials used in the construction of multiuse UTENSILS and FOOD-CONTACT SURFACES of EQUIPMENT must be as follows:

- Durable, corrosion-resistant, and nonabsorbent.
- Sufficient in weight and thickness to withstand repeated WAREWASHING.
- Finished to have a SMOOTH, EASILY CLEANABLE surface.

- Resistant to pitting, chipping, crazing, scratching, scoring, distortion, and decomposition.

7.4.1.1.3 Cast Iron (20)

Cast iron must not be used for UTENSILS or FOOD-CONTACT SURFACES of EQUIPMENT. Cast iron may be used as a surface for cooking. Cast iron may be used in UTENSILS for serving FOOD if the UTENSILS are used only as part of an uninterrupted process from cooking through service.

Cast iron FOOD DISPLAY dishes heated to a temperature of 74°C (165°F) for 15 seconds may be used for the immediate service of FOOD.

7.4.1.1.4 Lead (20)

Limitation of lead use must be as follows:

- Ceramic, china, crystal UTENSILS, and decorative UTENSILS such as hand-painted ceramic or china used in contact with FOOD must be lead-free or contain levels of lead not exceeding the limits for specific UTENSIL categories as allowed by LAW.
- Pewter alloys containing lead in excess of 0.05% must not be used as a FOOD-CONTACT SURFACE.
- Solder and flux containing lead in excess of 0.2% must not be used as a FOOD-CONTACT SURFACE.

7.4.1.1.5 Copper/Brass (26 C)

Copper and copper alloys such as brass must not be used in contact with a FOOD that has a pH below 6 (such as vinegar, fruit juice, or wine) or for a fitting or tubing installed between a BACKFLOW PREVENTION DEVICE and a carbonator.

Copper and copper alloys may be used in contact with beer brewing ingredients that have a pH below 6 in the prefermentation and fermentation steps of a beer brewing operation such as a brewpub or microbrewery.

7.4.1.1.6 Galvanized (26 C)

Galvanized metal must not be used for UTENSILS or FOOD-CONTACT SURFACES of EQUIPMENT.

7.4.1.1.7 Wood (20)

Wood use must be limited as follows:

- Wood and wood wicker must not be used as a FOOD-CONTACT SURFACE.
- **Hard maple or an equivalently hard, close-grained wood may be used for cutting boards; cutting blocks; bakers' tables; UTENSILS such as rolling pins, doughnut dowels, serving dishes, and chopsticks; and wooden paddles used in confectionery operations for pressure scraping kettles when manually preparing confections at a temperature of 110°C (230°F) or above.**
- **Whole, uncut, raw fruits and vegetables, and nuts in the shell may be kept in the wood shipping container in which they were received until the fruits, vegetables, or nuts are used.**
- **If the nature of the FOOD requires removal of rinds, peels, husks, or shells before consumption, the whole, uncut, raw FOOD may be kept in untreated wood containers or in treated wood containers if the containers are treated with a preservative that meets the requirements specified in 21 CFR 178.3800 Preservatives for Wood.**

7.4.1.1.8 Coatings (20)

Multiuse KITCHENWARE such as frying pans, griddles, sauce pans, cookie sheets, and waffle bakers that have a perfluorocarbon resin coating must be used with nonscoring or nonscratching UTENSILS and cleaning aids.

7.4.1.1.9 Nonfood-Contact Surfaces (21)

NONFOOD-CONTACT SURFACES of EQUIPMENT that are exposed to splash, spillage, or other FOOD soiling or that require frequent cleaning must be constructed of a corrosion-resistant, nonabsorbent, and SMOOTH material.

7.4.1.2 Single-Service and Single-Use Characteristics

7.4.1.2.1 Single-Service Materials Safe (26 C)

Materials used to make SINGLE-SERVICE and SINGLE-USE ARTICLES must not allow the migration of deleterious substances and must be safe.

7.4.1.2.2 No Colors/Odors/Taste (20)

Materials used to make SINGLE-SERVICE and SINGLE-USE ARTICLES must not impart colors, odors, or tastes to FOOD and must be clean.

7.4.2 Design and Construction

7.4.2.1 Durability and Strength

7.4.2.1.1 **Food-Contact Durability/Strength (20)**

FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be designed and constructed to be durable and to retain their characteristic qualities under normal use conditions.

7.4.2.1.2 **Nonfood-Contact Durability/Strength (21)**

NONFOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be designed and constructed to be durable and to retain their characteristic qualities under normal use conditions.

7.4.2.1.3 **Glass TMDs (26 C)**

FOOD TEMPERATURE-MEASURING DEVICES must not have sensors or stems constructed of glass, except for thermometers with glass sensors or stems encased in a shatterproof coating (such as candy thermometers).

7.4.2.2 Cleanability

7.4.2.2.1 **Multiuse Food-Contact Surfaces (20)**

Multiuse FOOD-CONTACT SURFACES must be

- SMOOTH.
- Free of breaks, open SEAMS >0.8 millimeters (1/32 inch), cracks, chips, inclusions, pits, and similar imperfections.
- Free of sharp internal angles, corners, and crevices.
- Finished to have SMOOTH welds and joints.
- ACCESSIBLE for cleaning and inspection by one of the following methods [does not apply to cooking oil storage tanks, distribution lines for cooking oils, or BEVERAGE syrup lines or tubes]:
 - Without being disassembled,
 - by disassembling without the use of tools, or
 - by easy disassembling with the use of handheld tools commonly available to maintenance and cleaning personnel (such as screwdrivers, pliers, open-end wrenches, and Allen wrenches).

Use low profile, nonslotted, NONCORRODING, and easy-to-clean fasteners on FOOD-CONTACT SURFACES and in splash zones. The use of exposed slotted screws, Phillips head screws, or pop rivets in these areas is prohibited.

7.4.2.2.2 CIP Equipment Design/Construction (20)

Clean-in-place EQUIPMENT must be designed and constructed so cleaning and sanitizing solutions circulate throughout a fixed system and contact all interior FOOD-CONTACT SURFACES and so the system self drains or can be completely drained of cleaning and sanitizing solutions.

Clean-in-place EQUIPMENT not designed to be disassembled for cleaning must be designed with inspection access points to ensure that all interior FOOD-CONTACT SURFACES throughout the fixed system are being effectively cleaned.

7.4.2.2.3 “V” Type Threads (20)

Except for hot oil cooking or filtering EQUIPMENT, “V” type threads must not be used on FOOD-CONTACT SURFACES.

7.4.2.2.4 Oil Filtering Equipment (20)

Hot oil filtering EQUIPMENT must be READILY ACCESSIBLE for filter replacement and filter cleaning.

7.4.2.2.5 Can Openers (20)

Cutting or piercing parts of can openers must be READILY REMOVABLE for cleaning and replacement.

7.4.2.2.6 Nonfood-Contact Design (21)

NONFOOD-CONTACT SURFACES must be free of unnecessary ledges, projections, and crevices, and must be designed and constructed to allow easy cleaning and facilitate maintenance.

7.4.2.2.7 Kick Plates (21)

Kick plates must be designed so that the areas behind them are ACCESSIBLE for inspection and cleaning by being easily REMOVABLE or capable of being rotated open without unlocking EQUIPMENT doors.

7.4.2.2.8 Grease Filters (21)

If not designed to be CLEANED IN PLACE, filters or other grease-extracting EQUIPMENT must be designed to be READILY REMOVABLE for cleaning and replacement.

7.4.2.3 Food TMDs (20)

FOOD TEMPERATURE-MEASURING DEVICES must be provided and READILY ACCESSIBLE for use in ensuring attainment and maintenance of FOOD temperatures. Tip-sensitive TEMPERATURE-MEASURING DEVICES, such as a thermocouple or thermistor, must be used for measuring thin FOOD products.

7.4.2.3.1 Food TMD Accuracy (20)

FOOD TEMPERATURE-MEASURING DEVICES

- Scaled only in Celsius or dually scaled in Celsius and Fahrenheit must be accurate to $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) in the intended range of use.
- Scaled only in Fahrenheit must be accurate to $\pm 2^{\circ}\text{F}$ in the intended range of use.

FOOD TEMPERATURE-MEASURING DEVICES must have a numerical scale, printed record, or digital readout in increments no greater than 1°C (2°F) in the intended range of use.

7.4.2.3.2 Ambient Air TMD Accuracy (21)

Ambient air TEMPERATURE-MEASURING DEVICES

- Scaled in Celsius or dually scaled in Celsius and Fahrenheit must be designed to be easily readable and accurate to $\pm 1.5^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) in the intended range of use.
- Scaled only in Fahrenheit must be accurate to $\pm 3^{\circ}\text{F}$ in the intended range of use.

7.4.2.4 Functionality

7.4.2.4.1 Ventilation Hood Design (37)

Exhaust ventilation hood systems in FOOD PREPARATION and WAREWASHING areas—including components such as hoods, fans, guards, and ducting—must be designed to prevent grease or condensation from draining or dripping onto FOOD, EQUIPMENT, UTENSILS, LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.4.2.4.2 Equipment Openings, Closures, and Deflectors (20)

EQUIPMENT openings, closures, and deflectors must conform to the following:

- A cover or lid for EQUIPMENT must overlap the opening and be sloped to drain.
- An opening in the top of a unit of EQUIPMENT and designed for use with a cover or lid must be flanged upward at least 5 millimeters ($2/10$ of an inch).
- Fixed piping, TEMPERATURE-MEASURING DEVICES, rotary shafts, and other parts extending into EQUIPMENT must be provided with a watertight joint at the point where the item enters the EQUIPMENT.
- If a watertight joint is not provided, the piping, TEMPERATURE-MEASURING DEVICES, rotary shafts, and other parts extending through the openings must be equipped with an apron designed to deflect condensation,

drips, and dust from openings into the FOOD; the opening must be flanged at least 5 millimeters (2/10 of an inch).

7.4.2.4.3 Beverage/Ice Dispensing (20)

In EQUIPMENT that dispenses liquid FOOD or ice in unpackaged form,

- The delivery tube, chute, orifice, and splash surfaces directly above the container receiving the FOOD must be designed in a manner (such as with barriers, baffles, or drip aprons) so that drips from condensation and splash are diverted from the opening of the container receiving the FOOD.
- The delivery tube, chute, and orifice must be protected from manual contact (such as by being recessed).
- The delivery tube or chute and orifice of EQUIPMENT used to vend liquid FOOD or ice in unpackaged form to self-service CONSUMERS must be designed so the delivery tube or chute and orifice are protected from dust, insects, rodents, and other CONTAMINATION by a self-closing door if the EQUIPMENT
 - Is in an outside area that does not otherwise afford protection against rain, windblown debris, insects, rodents, and other contaminants present in the environment OR
 - Is available for self service during hours when it is not under the full-time supervision of a FOOD EMPLOYEE.

The dispensing EQUIPMENT actuating lever or mechanism and filling device of CONSUMER self-service BEVERAGE dispensing EQUIPMENT must be designed to prevent contact with the lip-contact surface of glasses or cups that are refilled.

7.4.2.4.4 Bearings/Gears (21)

EQUIPMENT containing bearings and gears that require lubricants must be designed and constructed so the lubricant cannot leak, drip, or be forced into FOOD or onto FOOD-CONTACT SURFACES.

7.4.2.4.5 Beverage Line Cooling (20)

BEVERAGE tubing and cold-plate BEVERAGE cooling devices must not be installed in contact with stored ice. **This guidance does not apply to cold plates constructed integrally without SEAMS in an ice storage bin.**

7.4.2.4.6 Equipment Drainage (21)

EQUIPMENT compartments subject to accumulation of moisture because of conditions such as condensation, FOOD or BEVERAGE drip, or water from melting ice must be sloped to an outlet that allows complete draining.

7.4.2.4.7 Drain Lines (20)

Liquid waste drain lines must not pass through an ice machine or ice storage bin.

7.4.2.4.8 Condenser Unit (21)

If a condenser unit is an integral component of EQUIPMENT, the condenser unit must be separated from the FOOD and FOOD STORAGE space by a dustproof barrier.

7.4.2.4.9 Ambient Air TMDs (21)

TEMPERATURE-MEASURING DEVICES must conform to the following guidelines:

- In a mechanically refrigerated FOOD storage unit, the sensor of a TEMPERATURE-MEASURING DEVICE must be located to measure the air temperature in the warmest part of the unit.
- In a hot-FOOD storage unit, the sensor of a TEMPERATURE-MEASURING DEVICE must be located to measure the air temperature in the coolest part of the unit.
- Cold or hot holding EQUIPMENT used for POTENTIALLY HAZARDOUS FOOD must be designed to include and must be equipped with at least one integral or affixed TEMPERATURE-MEASURING DEVICE that is located to allow easy viewing of the device's temperature display.
- The above bullets do not apply to EQUIPMENT for which the placement of a TEMPERATURE-MEASURING DEVICE is not a practical means for measuring the ambient air surrounding the FOOD because of the design,

type, and use of the EQUIPMENT (such as calrod units, heat lamps, cold plates, bains-marie, steam tables, insulated FOOD transport containers, and salad bars).

- TEMPERATURE-MEASURING DEVICES must be easily readable.

7.4.2.5 Food Equipment Standards and Classification

7.4.2.5.1 Food-Contact Equipment Standards (20)

FOOD-CONTACT SURFACES of FOOD EQUIPMENT must comply with American National Standards Institute (ANSI), National Sanitation Foundation International (NSF International), or other internationally accredited FOOD EQUIPMENT sanitation standards for materials, design, and construction.

7.4.2.5.2 Nonfood-Contact Equipment Standards (21)

NONFOOD-CONTACT SURFACES of FOOD EQUIPMENT must comply with American National Standards Institute (ANSI), National Sanitation Foundation International (NSF International), or other internationally accredited FOOD EQUIPMENT sanitation standards for materials, design, and construction.

7.4.3 Numbers and Capacities

7.4.3.1 Cooling, Heating, and Holding Capacities

7.4.3.1.1 Cold/Hot Holding Capacity (20)

EQUIPMENT for cooling and heating FOOD and for holding cold and hot FOOD must be sufficient in number and capacity to maintain temperatures in POTENTIALLY HAZARDOUS FOOD.

7.4.3.2 Ventilation Hood Systems

7.4.3.2.1 Ventilation Hood (37)

Ventilation hood systems and devices must be sufficient in number and capacity to prevent grease or condensation from collecting on BULKHEADS and DECKHEADS.

7.4.4 Equipment Location and Installation

7.4.4.1 Fixed Equipment, Spacing or Sealing

7.4.4.1.1 *Fixed Equipment Installation (21)*

EQUIPMENT that is fixed because it is not EASILY MOVABLE must be installed in one of the following ways:

- Spaced to allow access for cleaning along the sides, behind, under, and above the EQUIPMENT.
- Spaced from adjoining EQUIPMENT, BULKHEAD, and DECKHEAD at a distance of not more than 0.8 millimeters or 1/32 inch.
- Sealed to adjoining EQUIPMENT or BULKHEAD (if the EQUIPMENT is exposed to spillage or seepage).

7.4.4.1.2 *Table-Mounted Sealed or Elevated (21)*

TABLE-MOUNTED EQUIPMENT that is not EASILY MOVABLE must be installed to allow cleaning of the EQUIPMENT and areas underneath and around the EQUIPMENT in one of the following ways:

- Sealed to the table.
- Elevated on legs.

7.4.4.2 Fixed Equipment, Elevation or Sealing

7.4.4.2.1 *Deck-Mounted Sealed or Elevated (21)*

Deck-mounted EQUIPMENT that is not EASILY MOVABLE must be sealed to the deck or elevated on legs that provide at least a 150-millimeter (6-inch) clearance between the deck and the EQUIPMENT.

7.4.4.2.2 *Deck-Mounted Clearance*

If no part of the deck under the deck-mounted EQUIPMENT is more than 150 millimeters (6 inches) from the point of cleaning access, the clearance space may be only 100 millimeters (4 inches).

7.4.4.2.3 *Table-Mounted Elevated (21)*

TABLE-MOUNTED EQUIPMENT that is not EASILY MOVABLE must be elevated on legs that provide at least a 100-millimeter (4-inch) clearance between the table and the EQUIPMENT.

7.4.4.2.4 Table-Mounted Clearance

The clearance space between the table and TABLE-MOUNTED EQUIPMENT may be either of the following:

- 75 millimeters (3 inches) if the horizontal distance of the table top under the EQUIPMENT is no more than 500 millimeters (20 inches) from the point of access for cleaning.
- 50 millimeters (2 inches) if the horizontal distance of the table top under the EQUIPMENT is no more than 75 millimeters (3 inches) from the point of access for cleaning.

7.4.5 Maintenance and Operation

7.4.5.1 Equipment

7.4.5.1.1 Food-Contact Equipment in Good Repair (20)

FOOD-contact EQUIPMENT must be maintained in good repair and proper adjustment, including the following:

- EQUIPMENT must be maintained in a state of repair and condition that meets the materials, design, construction, and operation specifications of these guidelines.
- Can opener parts that cut or pierce must be kept sharp to minimize the creation of metal fragments that can contaminate FOOD when the container is opened.

7.4.5.1.2 Nonfood-Contact Equipment in Good Repair (21)

Nonfood-CONTACT EQUIPMENT must be maintained in good repair and proper adjustment, including the following:

- EQUIPMENT must be maintained in a state of repair and condition that meets the materials, design, construction, and operation specifications of these guidelines.
- EQUIPMENT components such as doors, seals, hinges, fasteners, and kick plates must be kept intact and tight and adjusted in accordance with manufacturer's specifications.

7.4.5.1.3 Cutting Boards (20)

Surfaces such as cutting blocks and boards subject to scratching and scoring must be resurfaced if they can no longer be effectively cleaned and sanitized or discarded if they cannot be resurfaced.

7.4.5.1.4 Microwave Ovens (20)

Microwave ovens must meet the safety standards specified in 21 CFR 1030.10 Microwave Ovens, or equivalent.

7.4.5.2 Good Repair and Calibration

7.4.5.2.1 *Utensils and TMDs in Good Repair and Calibration (20)*

UTENSILS and TEMPERATURE-MEASURING DEVICES must be maintained in good repair and proper adjustment, including the following:

- UTENSILS must be maintained in a state of repair or condition that meets the materials, design, and construction specifications of these guidelines or must be discarded.
- FOOD TEMPERATURE-MEASURING DEVICES must be calibrated in accordance with manufacturer's specifications as necessary to ensure their accuracy.

7.4.5.2.2 *Ambient Air TMDs Good Repair and Calibration (21)*

Ambient air TEMPERATURE-MEASURING DEVICES must be maintained in good repair and be accurate within the intended range of use.

7.4.5.3 Single-Service and Single-Use Articles

7.4.5.3.1 *No Reuse (28)*

SINGLE-SERVICE and SINGLE-USE ARTICLES must not be reused.

7.4.5.3.2 *Bulk Milk Tubes (20)*

Bulk milk container dispensing tubes must be cut on the diagonal, leaving no more than 25 millimeters (1 inch) protruding from the chilled dispensing head.

7.4.5.3.3 *Shell Reuse (28)*

Mollusk and crustacean shells must not be used more than once as serving containers.

7.5 Warewashing

7.5.1 Warewashing Design and Construction

7.5.1.1 Warewashing Measuring Device Accuracy (22)

Provide a maximum registering TEMPERATURE-MEASURING DEVICE to verify the temperature in the warewash machines and the three-compartment sink.

7.5.1.1.1 Water TMD Accuracy (22)

Water TEMPERATURE-MEASURING DEVICES scaled

- In Celsius or dually scaled in Celsius and Fahrenheit must be designed to be accurate to $\pm 1.5^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) in the intended range of use.
- Only in Fahrenheit must be designed to be accurate to $\pm 3^{\circ}\text{F}$ in the intended range of use.

7.5.1.1.2 Pressure Gauge Accuracy (22)

Pressure measuring devices that display pressures in the water supply line for the fresh hot water sanitizing rinse must have increments of 7 kilopascals (1 pound per square inch or 0.07 bar) or smaller and must be accurate to ± 14 kilopascals (± 2 pounds per square inch or ± 0.14 bar) in the 100–170 kilopascals (15–25 pounds per square inch or 1.03–1.72 bars) range.

7.5.1.2 Warewashing Functionality

7.5.1.2.1 Water TMDs Readable (22)

Water TEMPERATURE-MEASURING DEVICES must be designed to be easily readable.

7.5.1.2.2 Water TMD Scale (22)

Water TEMPERATURE-MEASURING DEVICES on WAREWASHING machines must have a numerical scale, printed record, or digital readout in increments no greater than 1°C (2°F) in the intended range of use.

7.5.1.2.3 Warewasher Data Plate (22)

A WAREWASHING machine must be provided with an easily ACCESSIBLE and readable data plate affixed to or posted adjacent to the machine that indicates the machine's design and operating specifications including the

- Wash tank, rinse tank(s) if present, and final sanitizing rinse temperatures.
- Pressure required for the fresh water sanitizing rinse unless the machine is designed to use only a pumped sanitizing rinse.
- Conveyor speed in meters or feet per minute or minimum transit time for belt conveyor machines, minimum transit time for rack conveyor machines, and wash and final sanitizing rinse times as specified by the manufacturer for stationary rack machines.

7.5.1.2.4 Baffles/Curtains (22)

WAREWASHING machine wash and rinse tanks must be equipped with baffles, curtains, or other means to minimize internal CROSS-CONTAMINATION of the solutions in wash and rinse tanks.

7.5.1.2.5 Warewash TMDs (22)

A WAREWASHING machine must be equipped with a TEMPERATURE-MEASURING DEVICE that indicates the temperature of the water in each wash tank, in rinse tank(s) if present, and in the final sanitizing rinse manifold.

7.5.1.2.6 Pressure Gauge (22)

WAREWASHING machines that provide a fresh hot water sanitizing rinse must be equipped with a pressure gauge or similar device such as a transducer that measures and displays the water pressure in the supply line immediately before entering the WAREWASHING machine.

If the flow pressure measuring device is upstream of the fresh hot water sanitizing rinse control valve, the device must be mounted in a 6.4-millimeter (1/4-inch) iron pipe size (IPS) valve.

These guidelines do not apply to a machine that uses only a pumped or recirculated sanitizing rinse.

7.5.1.2.7 Manual Sanitizing Booster Heater (22)

If hot water is used for SANITIZATION in manual WAREWASHING operations, the sanitizing compartment of the sink must be designed with an integral heating device capable of maintaining water at a temperature not less than 77°C (171°F).

7.5.1.2.8 Self Draining (22)

Sinks and drainboards of WAREWASHING sinks and machines must be self draining.

7.5.2 Warewashing Numbers and Capacities

7.5.2.1 Three-Compartment Sinks

7.5.2.1.1 Three-Compartment Sink (22)

A sink with at least three compartments must be provided for manually washing, rinsing, and sanitizing EQUIPMENT and UTENSILS.

7.5.2.1.2 Size (22)

Sink compartments must be large enough to accommodate immersion of the largest EQUIPMENT and UTENSILS. If EQUIPMENT or UTENSILS are too large for the WAREWASHING sink, a WAREWASHING machine or alternative EQUIPMENT, such as a three-bucket system, must be used.

7.5.2.1.3 Manual Warewashing Alternatives

Alternative manual WAREWASHING EQUIPMENT may be used when there are special cleaning needs or constraints and its use is APPROVED. Alternative manual WAREWASHING EQUIPMENT may include the following:

- **High-pressure detergent sprayers.**
- **Low- or line-pressure spray detergent foamers.**
- **Other task-specific cleaning EQUIPMENT.**
- **Brushes or other implements.**
- **Receptacles such as a three-bucket system that substitute for the compartments of a three-compartment sink.**

7.5.2.2 Drainboards

7.5.2.2.1 Soiled/Clean Storage (22)

Drainboards, UTENSIL racks, or tables large enough to accommodate all soiled and cleaned items that may accumulate during hours of operation must be provided for UTENSIL holding before cleaning and after sanitizing.

7.5.2.3 Sanitizing Solutions, Testing Devices

7.5.2.3.1 Test Kit (22)

A test kit or other device that accurately measures the concentration in milligrams per liter (parts per million) of sanitizing solutions must be provided.

7.5.3 Warewashing Equipment Maintenance and Operation

7.5.3.1 Good Repair and Proper Adjustment

7.5.3.1.1 *Warewash Equipment Repair (22)*

WAREWASHING EQUIPMENT must be maintained in good repair and proper adjustment, including the following:

- WAREWASHING EQUIPMENT must be maintained in a state of repair and condition that meets the standards of the materials, design, and construction of these guidelines.
- Water pressure and water TEMPERATURE-MEASURING DEVICES must be maintained in good repair and be accurate within the intended range of use.

7.5.3.1.2 *Warewash Equipment Cleaning (22)*

WAREWASHING machines, drainboards, and the compartments of sinks, basins, or other receptacles used for washing and rinsing EQUIPMENT, UTENSILS, or raw FOODS, or laundering wiping cloths must be cleaned as follows:

- Before use.
- Throughout the day at a frequency necessary to prevent **recontamination and accumulation of debris** and to ensure the EQUIPMENT performs its intended function.
- At least every 24 hours (if used).

7.5.3.1.3 *Warewash Equipment Operation (22)*

A WAREWASHING machine and its auxiliary components must be operated in accordance with the machine's data plate and other manufacturer's instructions.

A WAREWASHING machine's conveyor speed or automatic cycle times must be maintained accurately timed in accordance with manufacturer's specifications.

7.5.3.1.4 *Cleaners (22)*

When used for WAREWASHING, the wash compartment of a sink, mechanical warewasher, or wash receptacle of alternative manual WAREWASHING EQUIPMENT must contain a wash solution of soap, detergent, acid cleaner, alkaline cleaner, degreaser, abrasive cleaner, or other cleaning agent according to the cleaning agent manufacturer's label instructions.

7.5.3.1.5 *Solution Clean (22)*

The wash, rinse, and sanitize solutions must be maintained clean.

7.5.3.2 Wash Temperatures

7.5.3.2.1 **Manual Wash Temperature (23)**

The temperature of the wash solution in manual WAREWASHING EQUIPMENT must be maintained at not less than the temperature specified on the cleaning agent manufacturer's label instructions.

7.5.3.2.2 **Warewash Wash Temperatures (23)**

The temperature of the wash solution in spray type warewashers that use hot water to sanitize must not be less than

- 74°C (165°F) for a stationary-rack, single-temperature machine.
- 66°C (150°F) for a stationary-rack, dual-temperature machine.
- 71°C (160°F) for a single-tank, conveyor, dual-temperature machine.
- 66°C (150°F) for a multi-tank, conveyor, multitemperature machine.

High wash tank temperatures do not compensate for low auxiliary rinse and/or hot water final rinse sanitizing temperatures.

7.5.3.2.3 **Wash Temperatures for Chemical Machines (23)**

The temperature of the wash solution in spray-type warewashers that use chemicals to sanitize must not be less than 49°C (120°F).

7.5.3.2.4 **Alarm (22)**

Warewash machines for vessels built to *VSP 2005 Construction Guidelines* or later or installed/replaced on existing vessels after July 2005 must be equipped with an audible or visual alarm that indicates when the sanitizing temperature or chemical SANITIZER level drops below the levels stated on the machine data plate.

7.5.4 Cleaning Equipment and Utensils

7.5.4.1 Cleaning Frequency

7.5.4.1.1 **Food-Contact Surfaces Clean (26 C)**

FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be clean to sight and touch.

7.5.4.1.2 **Encrusted (26 C)**

FOOD-CONTACT SURFACES of cooking EQUIPMENT and pans must be kept free of encrusted grease deposits and other soil accumulations.

7.5.4.1.3 Nonfood-Contact Surfaces (27)

NONFOOD-CONTACT SURFACES of EQUIPMENT must be kept free of an accumulation of dust, dirt, FOOD residue, and other debris.

7.5.4.1.4 Food-Contact Cleaning Frequency (26 C)

FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be washed, rinsed, and sanitized as follows:

- Before each use with a different type of raw animal FOOD such as beef, FISH, lamb, pork, or POULTRY.
- Each time there is a change from working with raw FOODS to working with READY-TO-EAT FOODS.
- Between uses with raw fruits and vegetables and with POTENTIALLY HAZARDOUS FOOD.
- Before using or storing a FOOD TEMPERATURE-MEASURING DEVICE.
- Any time during the operation when CONTAMINATION might have occurred.

7.5.4.1.5 In-Use Food-Contact Equipment (28)

If used with POTENTIALLY HAZARDOUS FOOD, FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS used on a continuing basis must be washed, rinsed, and sanitized at least every 4 hours.

7.5.4.1.6 Dispensing Equipment Cleaning (28)

Cleaning of EQUIPMENT such as ice bins; BEVERAGE dispensing nozzles; and enclosed components of EQUIPMENT such as ice makers, cooking oil storage tanks, and distribution lines, BEVERAGE dispensing lines, and syrup dispensing lines or tubes; and coffee bean grinders must be conducted

- At a frequency specified by the manufacturer, or
- In the absence of manufacturer specifications, at a frequency necessary to preclude accumulation of soil or mold.

7.5.4.1.7 Cooking/Baking Equipment Cleaning (28)

Cooking and baking EQUIPMENT must be cleaned as follows:

- FOOD-CONTACT SURFACES of cooking and baking EQUIPMENT must be cleaned at least every 24 hours.
- Cavities and door seals of microwave ovens must be cleaned at least every 24 hours by using the manufacturer's recommended cleaning procedure.

7.5.4.2 Dry Cleaning Methods

7.5.4.2.1 *Dry Cleaning (28)*

If dry cleaning is used, it must be conducted as follows:

- Methods such as brushing, scraping, and vacuuming must contact only surfaces soiled with dry FOOD residues that are not potentially hazardous.
- Cleaning EQUIPMENT used in dry cleaning FOOD-CONTACT SURFACES must not be used for any other purpose.

7.5.4.3 Precleaning and Racking

7.5.4.3.1 *Precleaning/Scrapping (23)*

FOOD debris on EQUIPMENT and UTENSILS must be scrapped over a waste disposal unit, pulper, or garbage receptacle or must be removed in a WAREWASHING machine with a prewash cycle.

7.5.4.3.2 *Presoak/Scrubbed (23)*

If necessary for effective cleaning, EQUIPMENT and UTENSILS must be preflushed, presoaked, or scrubbed with abrasives.

7.5.4.3.3 *Racking (22)*

Soiled items to be cleaned in a WAREWASHING machine must be loaded into racks, trays, or baskets or onto conveyors in a position that

- Exposes the items to the unobstructed spray from all cycles and
- Allows the items to drain.

7.5.4.4 Wet Cleaning

7.5.4.4.1 *Washing (23)*

FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be effectively washed to remove or completely loosen soils by using whatever manual or mechanical means is necessary (such as application of detergents containing wetting agents and emulsifiers; acid, alkaline, or abrasive cleaners; hot water; brushes; scouring pads; high-pressure sprays; or ultrasonic devices).

7.5.4.4.2 *Soil Specific (22)*

The washing procedures selected must be based on the type and purpose of the EQUIPMENT or UTENSIL and on the type of soil to be removed.

7.5.4.5 Alternative Manual Warewashing Procedures

7.5.4.5.1 Alternative Warewashing Procedures (23)

If washing in sink compartments or a WAREWASHING machine is impractical (such as when the EQUIPMENT is fixed or the UTENSILS are too large), washing must be done by using alternative manual WAREWASHING EQUIPMENT in accordance with the following procedures:

- EQUIPMENT must be disassembled as necessary to allow access of the detergent solution to all parts.
- EQUIPMENT components and UTENSILS must be scrapped or rough-cleaned to remove FOOD particle accumulation.
- EQUIPMENT and UTENSILS must be washed.

7.5.4.5.2 Sponges Limited (22)

Sponges must not be used in contact with cleaned and sanitized or in-use FOOD-CONTACT SURFACES.

7.5.4.6 Rinsing Procedures

7.5.4.6.1 Rinsing (23)

Washed EQUIPMENT and UTENSILS must be rinsed so that abrasives are removed and cleaning chemicals are removed or diluted with water by using one of the following procedures:

- Use of a distinct, separate water rinse after washing and before sanitizing (if using a three-compartment sink, alternative manual WAREWASHING EQUIPMENT equivalent to a three-compartment sink, or a three-step washing, rinsing, and sanitizing procedure in a WAREWASHING system for CIP EQUIPMENT).
- Use of a nondistinct water rinse integrated in the application of the sanitizing solution and wasted immediately after each application (if using a WAREWASHING machine that does not recycle the sanitizing solution or if using alternative manual WAREWASHING EQUIPMENT such as sprayers).
- Use of a nondistinct water rinse integrated in the application of the sanitizing solution (if using a WAREWASHING machine that recycles the sanitizing solution for use in the next wash cycle).

7.5.5 Sanitizing

7.5.5.1 Food-Contact Surfaces (24 C)

FOOD-CONTACT SURFACES of EQUIPMENT and UTENSILS must be sanitized.

7.5.5.2 Sanitizing Temperatures

7.5.5.2.1 Manual Hot-Water Sanitizing (24 C)

In a manual operation, if immersion in hot water is used for sanitizing,

- The temperature of the water must be maintained at 77°C (171°F) or above and
- The FOOD-CONTACT SURFACE must be immersed for at least 30 seconds.

7.5.5.2.2 Warewasher Hot-Water Sanitizing (24 C)

In a mechanical operation, the temperature of the fresh hot water sanitizing rinse as it enters the manifold must not be more than 90°C (194°F) or less than

- 74°C (165°F) for a stationary rack, single-temperature machine.
- 82°C (180°F) for all other machines.

The UTENSIL surface temperature must not be less than 71°C (160°F) as measured by an irreversible registering temperature indicator.

The maximum temperature of 90°C (194°F) does not apply to the high pressure and temperature systems with wand-type, hand-held spraying devices used for in-place cleaning and sanitizing of EQUIPMENT such as MEAT saws.

7.5.5.2.3 Warewasher Hot-Water Sanitizing Pressure (22)

The flow pressure of the fresh hot water sanitizing rinse in a WAREWASHING machine must not be less than 34.5 kilopascals (5 pounds per square inch or 0.34 bars) or more than 207 kilopascals (30 pounds per square inch or 2.07 bars) as measured in the water line immediately downstream or upstream from the fresh hot water sanitizing rinse control valve.

7.5.5.3 Sanitizing Concentrations

7.5.5.3.1 *Chemical Sanitizing Solutions (24 C)*

A chemical SANITIZER used in a sanitizing solution for a manual or mechanical operation must be listed in 40 CFR 180.940 Sanitizing Solutions.

7.5.5.3.2 *Chemical Sanitizing Exposure (24 C)*

A chemical SANITIZER must be used in accordance with the EPA-APPROVED manufacturer's label use instructions at a minimum temperature of 24°C (75°F) with an exposure time of 7 seconds for a chlorine solution and 30 seconds for other chemical SANITIZERS.

7.5.5.3.3 *Chemical Sanitizing Concentration (24 C)*

Sanitizing solutions must be used with the following concentrations:

- A chlorine solution must have a concentration between 50 MG/L (ppm) and 200 MG/L (ppm).
- An iodine solution must have a pH of 5.0 or less or a pH no higher than the level for which the manufacturer specifies the solution is effective AND a concentration between 12.5 MG/L (ppm) and 25 MG/L (ppm).
- A quaternary ammonium compound solution must have a concentration as specified in 40 CFR 180.940 Sanitizing Solutions AND as indicated by the manufacturer's use directions included in the labeling.

If another solution concentration or pH of a chlorine, iodine, or quaternary ammonium compound is used, the vessel must demonstrate to VSP that the solution achieves SANITIZATION and the use of the solution must be APPROVED.

If a chemical SANITIZER other than a chlorine, iodine, or quaternary ammonium compound is used, it must be applied in accordance with the manufacturer's use directions included in the labeling.

7.5.5.3.4 *Sanitizer Concentration Testing (22)*

Concentration of the sanitizing solution must be accurately determined by using a test kit or other device.

7.5.6 Protection of Clean Items

7.5.6.1 Drying

7.5.6.1.1 *Air Dried/Drained (28)*

After cleaning and sanitizing, EQUIPMENT and UTENSILS must be air dried or ADEQUATELY drained before contact with FOOD. Cleaned, sanitized, and air-dried dishware, glassware, and **UTENSILS may be polished with a clean, dry, lint-free cloth that is maintained clean and dry.**

7.5.6.2 Lubricating and Reassembling

7.5.6.2.1 *Lubricating (28)*

Lubricants must be applied to FOOD-CONTACT SURFACES that require lubrication in a manner that does not contaminate FOOD-CONTACT SURFACES.

7.5.6.2.2 *Assembling (28)*

EQUIPMENT must be reassembled so that FOOD-CONTACT SURFACES are not contaminated.

7.5.6.3 Storing Equipment, Utensils, Linens, and Single-Service and Single-Use Articles

7.5.6.3.1 *Storing Protected (28)*

Cleaned EQUIPMENT and UTENSILS, laundered LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES must be stored

- In a clean, dry location.
- In a location where they are not exposed to splash, dust, or other CONTAMINATION.
- At least 150 millimeters (6 inches) above the deck unless in packages on pallets, skids, or racks, which may be 127 millimeters (5 inches) above the deck.

EQUIPMENT can be stored in unfinished lockers or rooms in sealed or resealed original packaging, plastic boxes with complete coverage (plastic wrap if needed), and/or wrapped in plastic. EQUIPMENT must be off the deck (rack/deck stand/pallet) and the deck must be clean.

EQUIPMENT and shelving in unfinished lockers or rooms must be kept clean. Shelving does not need to meet EASILY CLEANABLE standard.

No SINGLE-SERVICE/SINGLE-USE ITEMS or chemicals should be stored in unfinished lockers or rooms.

Exposed GREY WATER and BLACK WATER lines must not be in unfinished EQUIPMENT lockers if they are push-fit or coupled. These lines can be solid pipe, butt-welded, or sleeve-welded. If plastic pipe, the lines can be heat fused or chemically welded.

7.5.6.3.2 Storing Inverted (28)

Clean EQUIPMENT and UTENSILS must be stored

- In a self-draining position that allows air drying.
- Covered or inverted.

7.5.6.3.3 Preset Tableware (28)

TABLEWARE preset longer than 4 hours before the beginning of service must be protected from CONTAMINATION by being wrapped, covered, or inverted.

When TABLEWARE is preset, exposed unused settings must be

- removed at the time a CONSUMER is seated or
- washed, rinsed, and sanitized before further use if the settings are not removed when a CONSUMER is seated.

7.5.6.3.4 Original Package (28)

SINGLE-SERVICE and SINGLE-USE ARTICLES must be kept in the original protective package or stored by using other means that afford protection from CONTAMINATION until used.

7.5.6.3.5 Utensil Dispensing (28)

Eating UTENSILS dispensed at a CONSUMER self-service unit such as a buffet or salad bar must be protected from CONTAMINATION.

7.5.7 Laundering

7.5.7.1 Laundry Facilities

7.5.7.1.1 Laundry Equipment (28)

If LINENS used in FOOD AREAS are laundered on the vessel, a mechanical clothes washer and dryer must be provided and used.

7.5.7.1.2 Laundry Operations Location (28)

Laundry operations must be located to protect operations from CONTAMINATION and only located where there are none of the following: Exposed FOOD; clean EQUIPMENT, UTENSILS, and

LINENS; or unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.5.7.2 Laundry Procedures

7.5.7.2.1 Laundry Frequency (28)

LINENS that do not come in direct contact with FOOD must be laundered between operations if they become wet, sticky, or visibly soiled.

7.5.7.2.2 Cloth Gloves (28)

Cloth gloves must be laundered before being used with a different type of raw animal FOOD such as beef, lamb, pork, and FISH.

7.5.7.2.3 Linens/Napkins (28)

LINENS and napkins used to line FOOD-service containers and cloth napkins must be laundered between each use.

7.5.7.2.4 Wet Wiping Cloths (28)

Wet wiping cloths must be laundered daily.

7.5.7.2.5 Dry Wiping Cloths (28)

Dry wiping cloths must be laundered as necessary to prevent CONTAMINATION of FOOD and clean serving UTENSILS.

7.5.7.2.6 Laundry Procedures (28)

Soiled LINENS must be kept in clean, nonabsorbent receptacles or clean, washable laundry bags and stored and transported to prevent CONTAMINATION of FOOD, clean EQUIPMENT, clean UTENSILS, and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.5.7.2.7 Washing (28)

LINENS must be mechanically washed.

7.6 Poisonous and Toxic Materials

7.6.1 Identification

7.6.1.1 Labeling

7.6.1.1.1 *Manufacturer Label (31 C)*

Original containers of POISONOUS OR TOXIC MATERIALS and PERSONAL-CARE ITEMS must bear a legible manufacturer's label.

7.6.1.1.2 Working Containers (31 C)

Working containers used for storing POISONOUS OR TOXIC MATERIALS such as cleaners and SANITIZERS taken from bulk supplies must be clearly and individually identified with the common name of the material.

7.6.2 Operational Supplies and Applications

7.6.2.1 Storage

7.6.2.1.1 Pesticide/Rodenticide Locker (31 C)

PESTICIDES, insecticides, and rodenticides must be stored in a locked area of the vessel that is not in a FOOD AREA.

7.6.2.1.2 Cleaning Materials Locker (31 C)

POISONOUS OR TOXIC MATERIALS used in the cleaning and maintenance of FOOD AREAS must be stored in a cleaning materials locker so they cannot contaminate FOOD, EQUIPMENT, UTENSILS, LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.6.2.1.3 Exemptions

This guideline does not apply to EQUIPMENT and UTENSIL cleaners and SANITIZERS stored in WAREWASHING areas for availability and convenience if the materials are stored to prevent CONTAMINATION of FOOD, EQUIPMENT, UTENSILS, LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.6.2.2 Use

7.6.2.2.1 Necessary Materials (31 C)

Only POISONOUS OR TOXIC MATERIALS required for the operation and maintenance of a FOOD AREA of the vessel—such as for cleaning and sanitizing EQUIPMENT and UTENSILS and controlling insects and rodents—are allowed in the FOOD AREAS of the vessel.

7.6.2.2.2 Use Conditions (31 C)

POISONOUS OR TOXIC MATERIALS must be used according to the following:

- LAW and these guidelines.
- Manufacturer's use directions included in labeling (and, for a PESTICIDE, manufacturer's label instructions stating that use is allowed in a FOOD AREA).

- Conditions of certification (if certification is required) for use of the pest-control materials.

7.6.2.2.3 *Application (31 C)*

POISONOUS OR TOXIC MATERIALS must be applied in a manner that prevents

- A HAZARD to employees or other persons.
- CONTAMINATION including toxic residues resulting from drip, drain, fog, splash, or spray on FOOD; EQUIPMENT; UTENSILS; LINENS; and SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.6.2.2.4 *Restricted-Use Applications (31 C)*

When a RESTRICTED-USE PESTICIDE is applied, FOOD, EQUIPMENT, UTENSILS, LINENS, and SINGLE-SERVICE and SINGLE-USE ARTICLES must be removed; covered with impermeable covers; or other precautions taken.

7.6.2.2.5 *Restricted-Use Applicator (31 C)*

A RESTRICTED-USE PESTICIDE must be applied only by an applicator certified as defined in 7 USC 136(e) Certified Applicator of the Federal Insecticide, Fungicide, and Rodenticide Act or a person under the direct supervision of a certified applicator.

7.6.2.2.6 *Equipment Cleaning and Sanitizing (31 C)*

FOOD EQUIPMENT and UTENSILS in the area treated must be cleaned and sanitized after the application.

7.6.2.2.7 *Containers (31 C)*

A container previously used to store cleanser, chemicals, or POISONOUS OR TOXIC MATERIALS must not be used to store, transport, or dispense FOOD. Additionally, FOOD containers must not be used to store, transport, or dispense cleanser, chemicals, or POISONOUS OR TOXIC MATERIALS.

7.6.2.3 Sanitizers and Other Food Area Chemicals

7.6.2.3.1 *Sanitizers (31 C)*

Chemical SANITIZERS and other chemical antimicrobials applied to FOOD-CONTACT SURFACES must meet the requirements specified in 21 CFR 178.1010 Sanitizing Solutions.

7.6.2.3.2 *Fruit/Vegetable Wash (31 C)*

Chemicals used to wash or peel raw whole fruits and vegetables must meet the requirements specified in 21 CFR 173.315

Chemicals Used in Washing or to Assist in the Peeling of Fruits and Vegetables (Annex 13.12).

7.6.2.3.3 *Boiler Water Additives (31 C)*

Chemicals used as boiler water ADDITIVES for culinary steam or other FOOD AREA purposes must meet the requirements specified in 21 CFR 173.310 Boiler Water ADDITIVES.

7.6.2.3.4 *Drying Agents (31 C)*

Drying agents used in conjunction with SANITIZATION must contain only components listed as one of the following:

- Generally recognized as safe for use in FOOD as specified in 21 CFR 182 Substances Generally Recognized as Safe or in 21 CFR 184 Direct FOOD Substances Affirmed as Generally Recognized as Safe.
- Generally recognized as safe for the intended use as specified in 21 CFR 186 Indirect FOOD Substances Affirmed as Generally Recognized as Safe.
- APPROVED for use as a drying agent under a prior sanction specified in 21 CFR 181 Prior-Sanctioned FOOD Ingredients.
- Specifically regulated as an indirect FOOD ADDITIVE for use as a drying agent as specified in 21 CFR Parts 175-178.
- APPROVED for use as a drying agent under the threshold of regulation process established by 21 CFR 170.39 Threshold of Regulation for Substances Used in FOOD-Contact Articles.

7.6.2.3.5 *Approved for Use with Chemical Sanitizers (31 C)*

When used with chemical SANITIZATION, drying agents must be specifically APPROVED for use with chemical sanitizing solutions.

7.6.2.3.6 *Lubricants (31 C)*

Lubricants must meet the requirements specified in 21 CFR 178.3570 Lubricants with Incidental FOOD CONTACT if they are used on FOOD-CONTACT SURFACES; on bearings and gears on or within FOOD-CONTACT SURFACES; or on bearings and gears located so that lubricants may leak, drip, or be forced into FOOD or onto FOOD-CONTACT SURFACES.

7.6.2.4 Pesticides and Rodenticides

7.6.2.4.1 *Restricted-Use Pesticides (31 C)*

RESTRICTED-USE PESTICIDES used in FOOD AREAS must meet the requirements specified in 40 CFR 152 Subpart I Classification of PESTICIDES.

7.6.2.4.2 *Rodent Bait (31 C)*

Rodent bait used in FOOD AREAS must be contained in a covered, tamper-resistant bait station.

7.6.2.4.3 *Tracking Powder Pesticides (31 C)*

A tracking powder PESTICIDE must not be used in a FOOD AREA.

7.6.2.4.4 *Nontoxic Tracking Powders (19)*

A nontoxic tracking powder such as talcum or flour, if used, must not contaminate FOOD.

7.6.2.4.5 *Prevent Contamination (28)*

If a nontoxic tracking powder such as talcum or flour is used, it must not contaminate EQUIPMENT, UTENSILS, LINENS, or SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.6.3 Medicines

7.6.3.1 Restriction and Storage

7.6.3.1.1 *Necessary Medicines (31 C)*

Only medicines necessary for the health of the FOOD EMPLOYEES are allowed in a FOOD AREA.

7.6.3.1.2 *Medicine Labeling/Separation (31 C)*

Medicines in a FOOD AREA for FOOD EMPLOYEES' use must be labeled and be located in an area such as the chef's office to prevent the CONTAMINATION of FOOD, EQUIPMENT, UTENSILS, LINENS, or SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.6.3.1.3 *First Aid Supplies (31 C)*

First aid supplies in a FOOD AREA for FOOD EMPLOYEES' use must be labeled and stored in a kit or a container in a location that prevents the CONTAMINATION of FOOD, EQUIPMENT, UTENSILS, LINENS, or SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.7 Facilities

7.7.1 Handwashing and Toilet Facilities for **Food Employees**

This applies to toilet facilities for galley personnel even if those facilities are ACCESSIBLE to other crew members.

7.7.1.1 Handwashing Facility Installation

7.7.1.1.1 *Convenient (29 C)*

Each FOOD PREPARATION AREA, bar, WAREWASHING area, and garbage-processing area must have at least one handwashing facility in it.

This applies to self-service and served candy shops where employees serve candy, refill self-service containers, etc.

7.7.1.1.2 *8 Meters/26 Feet (29 C)*

The handwashing facility must be within 8 meters (26 feet) of all parts of the area and should not be located in an adjacent area that requires passage through a closed door where users make hand contact with the door.

Handwash sinks must be at least 750 millimeters (30 inches) above the deck so users do not have to reach excessively to wash their hands.

Counter-mounted handwash sinks may be installed a minimum of 600 millimeters (24 inches) above the deck, as measured at the counter level.

7.7.1.1.3 *Tempered Water (29 C)*

A handwashing sink must be equipped to provide water at a temperature of at least 38°C (100°F) through a mixing valve or combination faucet. For handwash sinks with electronic sensors and other types of handwash sinks where users cannot make temperature adjustments, the temperature after the mixing valve must not exceed 49°C (120°F).

7.7.1.1.4 *Metered Faucet (30)*

A self-closing, slow-closing, or metering faucet must provide a flow of water for at least 15 seconds without the need to reactivate the faucet.

7.7.1.1.5 *Automatic Systems (30)*

An automatic handwashing facility must be installed in accordance with manufacturer's instructions.

7.7.1.1.6 Dispenser/Receptacle (30)

A handwashing facility must include a sink, soap dispenser, single-use towel dispenser, and waste receptacle.

7.7.1.1.7 Sign (30)

A sign stating “wash hands often,” “wash hands frequently,” or similar wording in a language that the FOOD EMPLOYEES understand must be posted over handwashing sinks.

7.7.1.2 Toilet Facility Installation

7.7.1.2.1 Convenient (29 C)

Toilet rooms must be provided and conveniently located.

7.7.1.2.2 Handwashing Facilities (29 C)

Handwashing facilities must be in or immediately adjacent to toilet rooms or vestibules.

7.7.1.2.3 Sign (30)

A sign must be conspicuously posted on the BULKHEAD adjacent to the door of the toilet or on the back of the door. The sign must state “WASH HANDS AFTER USING TOILET” in a language the FOOD EMPLOYEES understand.

A sign must be posted advising users of toilet facilities to use hand towel, paper towel, or tissue to open the door unless the exit is hands free.

A pictogram that illustrates the correct use and disposal of paper towels may be used in lieu of a sign.

Toilet facilities must be equipped so persons exiting the toilet room are not required to touch the door handle with bare hands.

Where toilet stalls include handwashing facilities, the bare-hands-free contact must begin in the toilet stall. Toilet facilities with multiple exits must have bare-hands-free contact at each exit.

Bare-hands-free contact may be accomplished by methods such as locating paper towel dispensers at sinks and waste containers near the room door, installing mechanically operated doors, or using other effective means.

7.7.1.2.4 Enclosed/Doors (30)

Toilet rooms must be completely enclosed and must have tight-fitting, self-closing doors that must be kept closed except during cleaning or maintenance.

7.7.1.2.5 Waste Receptacle (30)

EASILY CLEANABLE receptacles must be provided for waste materials.

7.7.1.2.6 Unlocked (29 C)

Toilet facilities intended for use by galley personnel must not be locked when the galley is in service.

7.7.1.3 Handwashing and Toilet Facility Maintenance

7.7.1.3.1 Accessible (29 C)

Handwashing facilities must be used for no other purpose and must be ACCESSIBLE at all times.

7.7.1.3.2 Facilities Clean/Good Repair (30)

Handwashing facilities must be kept clean and in good repair.

7.7.1.3.3 Soap/Towels (30)

Each handwashing facility must have a supply of hand-cleansing soap or detergent and a supply of SINGLE-SERVICE paper towels available.

7.7.1.3.4 Toilets Clean/Good Repair (30)

Toilet fixtures must be kept clean and in good repair.

7.7.1.3.5 Toilet Tissue (30)

A supply of toilet tissue must be provided at each toilet at all times.

7.7.2 Passenger Self-Service Buffet Handwashing Stations (30)

7.7.2.1 Installation Date

The following section applies to all vessels with a keel laid date of June 1, 2018 or later and any FOOD self-service areas that have been modified since June 1, 2018, including replacement, relocation, or addition of buffet self-service counter(s) or self-service EQUIPMENT.

7.7.2.2 Number

Provide one obvious handwashing station per 100-passenger seating or fraction thereof. Stations should be equally distributed between the major passenger entry points to the buffet area and must be separate from a toilet room.

7.7.2.3 Passenger Entries

Provide handwashing stations at each minor passenger entry to the main buffet areas proportional to the passenger flow, with at least one per entry. These handwash stations can count toward the requirement of one station per 100 passengers.

7.7.2.4 Self-Service Stations Outside the Main Buffet

Provide at least one handwashing station at the passenger entrance of each self-service station outside of the main buffet. BEVERAGE stations are excluded.

7.7.2.5 Equipment and Supplies

The handwashing station must include a handwash sink with hot and cold water, soap dispenser, and SINGLE-USE paper towel dispenser. Electric hand dryers can be installed in addition to paper towel dispensers. Each handwashing station must have a supply of hand-cleansing soap or detergent and a supply of SINGLE-SERVICE paper towels available. Waste receptacles must be provided in close proximity to the handwash sink and sized to accommodate the quantity of paper towel waste generated. The handwashing station may be decorative but must be nonabsorbent, durable, and EASILY CLEANABLE.

7.7.2.6 Automatic Handwashing System

An automatic handwashing system in lieu of a handwash sink is acceptable.

7.7.2.7 Sign

Each handwashing station must have a sign advising passengers to wash hands before eating. A pictogram can be used in lieu of words on the sign.

7.7.2.8 Location

Stations can be installed just outside of the entry. Position the handwashing stations along the passenger flow to the buffets.

7.7.2.9 Lighting

The light intensity must be at least 110 lux (10 foot candles) at passenger

7.7.3 Solid Waste

7.7.3.1 Receptacles and Containers

7.7.3.1.1 Containers (32)

Receptacles and waste-handling containers for REFUSE and recyclables and for use with materials containing FOOD residue must be durable, nonabsorbent, EASILY CLEANABLE, and

leakproof.

7.7.3.1.2 Insect/Rodent Resistant (32)

Receptacles and waste-handling containers for REFUSE and recyclables and for use with materials containing FOOD residue must be insect and rodent resistant and must have tight-fitting lids.

7.7.3.1.3 Covered/Provided (32)

Receptacles and waste-handling containers must be kept covered when not in continuous use and after they are filled.

7.7.3.1.4 Location (32)

A receptacle or waste-handling container must be provided in each area of the vessel or premise where REFUSE is generated or commonly discarded or where recyclables are placed.

7.7.3.1.5 Wash Facilities (32)

Facilities suitable for washing receptacles and waste-handling containers must be provided separate from FOOD EQUIPMENT and UTENSIL storage areas or FOOD PREPARATION AREAS.

7.7.3.1.6 Design/Supplies (32)

The designated container wash area must be EASILY CLEANABLE and must have tempered water, access to detergent, and suitable drainage.

7.7.3.1.7 Cleaned (32)

Receptacles and waste-handling containers must be cleaned when emptied.

7.7.3.2 Garbage and Refuse Storage Room

7.7.3.2.1 Easily Cleanable/Durable (32)

The dry and refrigerated garbage and REFUSE storage room must be constructed of EASILY CLEANABLE, corrosion-resistant, nonabsorbent, and durable materials.

7.7.3.2.2 Size (32)

The garbage and REFUSE storage room must be large enough to store and process the garbage and REFUSE.

7.7.3.2.3 Prevent Contamination (32)

The garbage and REFUSE storage room must be located so as to prevent CONTAMINATION in FOOD PREPARATION, FOOD STORAGE, and UTENSIL washing areas.

7.7.3.2.4 Good Repair/Clean (32)

The garbage and REFUSE storage room must be maintained in good repair and kept clean.

7.7.4 Liquid Waste Disposal and Plumbing

7.7.4.1 Drain Lines

7.7.4.1.1 Drain Lines (19)

Drain lines from all fixtures; sinks; appliances; compartments; refrigeration units; or devices used, designed for, or intended to be used in the a) preparation, b) processing, c) storage, or d) handling of FOOD, ice, or drinks must be indirectly connected to appropriate waste systems by means of an AIR GAP or AIR-BREAK.

Drain lines from handwashing and mop sinks may be directly connected to the appropriate waste system.

7.7.4.1.2 Overhead (19)

Drain lines carrying SEWAGE or other liquid waste must not pass directly overhead or horizontally through spaces used for preparing, serving, or storing FOOD or for washing or storing UTENSILS and EQUIPMENT. Drain lines that are unavoidable in these FOOD AREAS must be sleeve-welded and must not have mechanical couplings.

7.7.4.1.3 Warewash Sink/Machine Drains (28)

All drain lines from WAREWASHING sinks or machines must drain through an AIR GAP or AIR-BREAK to a drain or SCUPPER.

7.7.4.2 Liquid Waste Disposal

7.7.4.2.1 Discharge (35)

BLACK and GRAY WATER must be discharged to the vessel's wastewater disposal system and must not pool on the deck.

7.7.4.2.2 Leakage (35)

Leakage of SEWAGE tanks or discharge of SEWAGE into the bilge or other areas on the vessel is prohibited.

7.7.4.3 Plumbing

7.7.4.3.1 **Good Repair (34)**

A PLUMBING SYSTEM in a FOOD AREA must be maintained in good repair.

7.7.5 Decks, Bulkheads, and Deckheads

This applies to self-service and served candy shops where employees serve candy and refill self-service containers and CONSUMERS serve themselves.

7.7.5.1 Design and Construction

7.7.5.1.1 **Cleanable (33)**

Decks, BULKHEADS, and DECKHEADS in FOOD preparation, WAREWASHING, pantries, bars, and FOOD and EQUIPMENT storage areas must be constructed and maintained for easy cleaning.

Decks may be of nonskid construction provided they are EASILY CLEANABLE. Carpet is not considered EASILY CLEANABLE and should not be used in these areas.

EQUIPMENT can be stored in unfinished lockers or rooms in sealed or resealed original packaging, plastic boxes with complete coverage (plastic wrap if needed), and/or wrapped in plastic. EQUIPMENT must be off the deck (rack/deck stand/pallet) and the deck must be clean.

EQUIPMENT and shelving in unfinished lockers or rooms must be kept clean. Shelving does not need to meet EASILY CLEANABLE standard.

No SINGLE-SERVICE/SINGLE-USE ITEMS or chemicals should be stored in unfinished lockers or rooms.

Exposed GREY WATER and BLACK WATER lines must not be in unfinished EQUIPMENT lockers if they are push-fit or coupled. These lines can be solid pipe, butt-welded, or sleeve-welded. If plastic pipe, the lines can be heat fused or chemically welded.

7.7.5.1.2 **Coving (33)**

BULKHEAD/deck, EQUIPMENT/deck, cabinet/deck, and DECK SINK coaming/deck junctures must have COVING (including galleys, pantries, buffets, bars, waiter stations, dining room work counters, provisions, FOOD STORAGE ROOMS,

EQUIPMENT/UTENSIL storage rooms, and toilet rooms intended for use by galley personnel).

7.7.5.1.3 Finishes (33)

BULKHEADS and DECKHEADS must have SMOOTH, hard finishes and light-colored surfaces.

7.7.5.1.4 Corrosion Resistant (33)

Decks, BULKHEADS, and DECKHEADS in FOOD PREPARATION, WAREWASHING, pantries, and storage areas must be corrosion resistant.

7.7.5.1.5 Attached Equipment (33)

Light fixtures, vent covers, and similar EQUIPMENT attached to the BULKHEADS or DECKHEADS must be EASILY CLEANABLE.

7.7.5.1.6 Exposed Lines (33)

Exposed utility service lines and pipes, including lines for fire detection and protection systems, must be installed so they do not obstruct or prevent cleaning.

7.7.5.1.7 Cleanable Surfaces (33)

Surfaces subject to routine splashes, spillage, or other soiling during normal use must have EASILY CLEANABLE features.

7.7.5.1.8 Deck Mats (33)

Mats must be designed to be REMOVABLE and EASILY CLEANABLE.

7.7.5.2 Maintenance

7.7.5.2.1 Clean (33)

Decks, BULKHEADS, DECKHEADS, and attached EQUIPMENT in FOOD PREPARATION, WAREWASHING, pantries, and storage areas must be cleaned as often as necessary.

7.7.5.2.2 Timing (33)

Cleaning must be done during periods when the least amount of FOOD is exposed.

7.7.5.2.3 Good Repair (33)

Decks, BULKHEADS, and DECKHEADS in FOOD PREPARATION, WAREWASHING, pantries, and storage areas must be maintained in good repair.

7.7.5.2.4 Ventilation (33)

Slots for supply ventilation over the void space (plenum) are not allowed directly over FOOD preparation areas, FOOD STORAGE areas, or clean EQUIPMENT storage.

This section applies to vessels built or renovated in accordance with the *2011 VSP Construction Guidelines* or later.

7.7.6 Lighting

This section applies to self-service and served candy shops where employees serve candy and refill self-service containers and CONSUMERS serve themselves.

7.7.6.1 Intensity

7.7.6.1.1 220 Lux/20 Foot Candles (36)

The light intensity must be at least 220 lux (20 foot candles) on FOOD preparation surfaces.

The light intensity must be at least 220 lux (20 foot candles) as measured 75 centimeters (30 inches) above the deck in FOOD PREPARATION AREAS, handwashing facilities, WAREWASHING areas, EQUIPMENT, and UTENSIL storage, pantries, toilet rooms, and CONSUMER self-service areas.

7.7.6.1.2 110 Lux/10 Foot Candles (36)

When lights are in use, the light intensity must be at least 110 lux (10 foot candles) at a distance of 75 centimeters (30 inches) above the deck in walk-in refrigerator units and DRY STORAGE AREAS and in other areas and rooms during cleaning operations.

The light intensity must be at least 110 lux (10 foot candles) behind and around mounted EQUIPMENT, including counter-mounted EQUIPMENT.

7.7.6.1.3 Bars and Waiter Stations (36)

The light intensity must be at least 110 lux (10 foot candles) at handwashing stations in bars. In bars and dining room waiter stations, provide 220 lux (20 foot candles) light intensity during cleaning operations.

7.7.6.2 Protected

7.7.6.2.1 Shielded/Shatter Resistant (36)

Light bulbs must be shielded, coated, or otherwise shatter resistant in areas with exposed FOOD; clean EQUIPMENT, UTENSILS,

and LINENS; or unwrapped SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.7.6.2.2 Heat Lamps (36)

An infrared or other heat lamp must be protected against breakage by a shield surrounding and extending beyond the bulb so only the face of the bulb is exposed.

7.7.7 Ventilation

7.7.7.1 Design and Operation

7.7.7.1.1 Sufficient (37)

All FOOD preparation, WAREWASHING, and toilet rooms must have sufficient ventilation to keep them free of excessive heat, steam, condensation, vapors, obnoxious odors, smoke, and fumes.

7.7.7.1.2 Effective (37)

Ventilation hood systems and devices must operate effectively to prevent grease and condensate from collecting on the BULKHEADS and DECKHEADS and to remove contaminants generated by EQUIPMENT located under them.

7.7.7.1.3 No Contamination (37)

Heating, ventilating, and air conditioning systems must be designed and installed so that make-up air intake and exhaust vents do not cause CONTAMINATION of FOOD, FOOD-CONTACT SURFACES, EQUIPMENT, or UTENSILS.

7.7.7.2 Maintenance

7.7.7.2.1 Filters (37)

Filters and other grease-extracting EQUIPMENT must be designed to be READILY REMOVABLE for cleaning and replacement if not designed to be CLEANED IN PLACE. Intake and exhaust air ducts must be cleaned and filters changed so they are not a source of CONTAMINATION by dust, dirt, and other materials.

7.7.8 Cleaning Equipment and Unnecessary Articles

7.7.8.1 Storage

7.7.8.1.1 Necessary Articles (38)

Only articles necessary for the FOOD service operation must be stored in FOOD PREPARATION, FOOD STORAGE, and WAREWASHING areas.

7.7.8.1.2 *Cleaning Locker (38)*

Maintenance tools such as mops, brooms, and similar items must be stored in a designated locker so they do not contaminate FOOD, FOOD-CONTACT SURFACES of UTENSILS and EQUIPMENT, LINENS, or SINGLE-SERVICE and SINGLE-USE ARTICLES.

7.7.8.1.3 *Labeled (38)*

The locker must be labeled “CLEANING MATERIALS ONLY.”

7.7.8.1.4 *Orderly Manner (38)*

Maintenance tools such as mops, brooms, and similar items must be stored in an orderly manner that facilitates cleaning of the area used for storing the maintenance tools.

7.7.8.1.5 *Mop Drying (38)*

After use, mops must be placed in a position that allows them to air dry without soiling walls, EQUIPMENT, or supplies.

7.7.8.1.6 *Bucket Storage (38)*

Wash, rinse, and sanitizing buckets or other containers may be stored with maintenance tools as long as they are stored inverted and nested.

8.0 Integrated Pest Management (IPM)

This section includes the following subsections:

- 8.1 Plan Development, Evaluation, and Use of Pesticides
- 8.2 Pest Control
- 8.3 Knowledge

References for 8.0 Integrated Pest Management (IPM) can be found in Annex 14.8.

8.1 Plan Development, Evaluation, and Use of Pesticides

8.1.1 IPM Plans

8.1.1.1 IPM Plan (40)

Each vessel must have an IPM plan to implement effective monitoring and control strategies for pests aboard the vessel.

8.1.1.2 Monitoring (40)

The IPM plan must set a schedule for periodic active monitoring inspections, including some at night or during periods of no or minimal activity.

8.1.1.3 Logs (40)

The IPM plan must include provisions for logs for active monitoring of pest sightings in operational areas of the vessel. The IPM plan also must include provisions for training of crew members in charge of log completion. The time of the active monitoring inspections must be recorded in the log.

8.1.1.4 Passive Surveillance (40)

The IPM plan must include passive surveillance procedures such as glue traps or other passive monitoring devices and must include the location of each. A passive device monitoring log must be maintained.

8.1.1.5 Action and Follow Up (40)

When pests are observed during an inspection, the log must include action taken as well as follow-up inspection results.

8.1.2 Plan Evaluation

8.1.2.1 Evaluation (40)

The vessel's IPM plan must be evaluated for effectiveness periodically or whenever there is a significant change in the vessel's operation or structure (e.g., renovation).

Evaluation may be required more frequently in areas where pest infestations cannot be controlled.

8.1.2.2 Reviews (40)

IPM plan evaluations and changes must be documented in the IPM plan.

8.1.2.3 Inspections (40)

The IPM plan, monitoring records, and other documentation must be available for review during inspections.

8.1.3 IPM and Pesticide Use

8.1.3.1 Pesticide Application

8.1.3.1.1 Pesticide Record (40)

The IPM plan must include a record of **GENERAL-USE and RESTRICTED-USE PESTICIDES** used to control pests and vectors. The record must include all **GENERAL-USE and RESTRICTED-USE PESTICIDES** currently onboard the vessel and those used in the previous 12 months.

8.1.3.1.2 Restricted Use (39 C)

A RESTRICTED-USE PESTICIDE must be applied only by a certified applicator or a person with training and testing equivalent to that of a certified applicator.

8.1.3.1.3 Applicator Training (40)

Training of the pest-control personnel must be documented.

8.1.3.1.4 Safety (40)

The IPM plan must establish health and safety procedures to protect the passengers and crew.

8.2 Pest Control

8.2.1 Exclusion

8.2.1.1 Food Areas

8.2.1.1.1 Effective Control (39 C)

The presence of insects, rodents, and other pests must be effectively controlled to minimize their presence in the FOOD STORAGE, preparation, and service areas and WAREWASHING and UTENSIL storage areas aboard a vessel.

8.2.1.1.2 Exclusion (40)

Entry points where pests may enter the FOOD AREAS must be protected.

Rat guards must be made of a durable and nonchewable material. Single-line, multiple-line, or conical shape rat guards should be used according to the manufacturer's specifications.

Rat guards must be on all lines that go ashore on arrival and until 1 hour before the ship leaves port. Each line must have at least one rat guard placed either as far as practicable from the pier or as far as practicable from the ship but still close enough for any openings to be stuffed with nonchewable material. Rat guards must not be staggered on adjacent lines, and a group of lines must not be merged onto one rat guard.

8.2.1.1.3 Incoming Food and Other Supplies (40)

Incoming shipments of FOOD and all other supplies must be routinely inspected for evidence of insects, rodents, and other pests. A record of these inspections must be maintained onboard the vessel and must be available for review during inspections.

8.2.1.1.4 IPM Inspections (40)

All FOOD AREAS must be inspected at a frequency that can quickly detect the evidence of pests, harborage conditions, cleanliness, and protection of outer openings.

Nonfood Areas

Reasonable care must be given to conduct inspections in nonfood areas for the presence of insects, rodents, and other pests.

The garbage handling areas of the vessel must be inspected at least weekly for the presence of insects, rodents, and other pests. The results of these inspections must be maintained in a log. **These results may be included in the log of the FOOD AREA inspections.**

8.2.2 Control Measures

8.2.2.1 Chemical

8.2.2.1.1 Chemical Controls (39 C)

Chemical control measures must conform to products and application procedures specifically allowed in the FOOD safety section of these guidelines and the vessel's IPM plan.

8.2.2.2 Physical

8.2.2.2.1 *Insect-Control Devices (40)*

Insect-control devices that electrocute or stun flying insects are not permitted in FOOD AREAS.

8.2.2.2.2 *Food Protection (19)*

Insect control devices such as insect light traps must not be located over FOOD STORAGE, FOOD PREPARATION AREAS, FOOD SERVICE stations, or clean EQUIPMENT. Dead insects and insect fragments must be prevented from falling on exposed FOOD.

8.2.2.2.3 *Utensil Protection (28)*

Insect-control devices must not be located over WAREWASHING, UTENSIL storage areas, EQUIPMENT, UTENSILS, LINENS, or unwrapped SINGLE-SERVICE or SINGLE-USE ARTICLES. Dead insects and insect fragments must be prevented from falling on clean items.

8.2.2.2.4 *Cleaning (40)*

Dead or trapped insects, rodents, and other pests must be removed from control devices and the vessel at a frequency that prevents their accumulation or decomposition or the attraction of other pests.

8.3 Integrated Pest Management Knowledge

8.3.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of IPM operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of IPM operations. The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector's questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of IPM operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

9.0 Housekeeping

This section includes the following subsections:

- 9.1 OUTBREAK Prevention and Management Procedures
- 9.2 Knowledge

References for 9.0 Housekeeping can be found in Annex 14.9.

9.1 Outbreak Prevention and Management Procedures

9.1.1 Disinfection

9.1.1.1 Public Areas

9.1.1.1.1 *Continuous Disinfection (41)*

When the cumulative proportion of cases of AGE among passengers or crew members is $\geq 2\%$, the OUTBREAK management response must include cleaning and disinfecting all public areas, including handrails and restrooms, on a continuous basis while passengers and/or crew are circulating in those areas.

This process involves DISINFECTION of hand-contact surfaces of all public areas, including restrooms and handrails, throughout the ship and identified in the OPRP. Workers disinfect these surfaces without interruption along a logical route by deck, venue, and area when people are present or circulating in these areas.

9.1.1.1.2 *Cabin Cleaning (41)*

Cabins that house passengers or crew with AGE must be cleaned and disinfected daily while the occupants are ill.

9.1.1.1.3 *Precautionary Measures (41)*

Precautionary measures by housekeeping personnel must be taken in consultation with the vessel's medical staff to prevent the spread of AGE from cabin to cabin.

9.1.1.1.4 *Example*

Precautionary measures by the housekeeping personnel may include using disposable personal protection EQUIPMENT, including gloves that are changed after each cabin; cleaning cabins with ill passengers or crew after all other cabins; or having specific crew members only clean cabins of ill passengers or crew.

9.1.1.1.5 Written OPRP (41)

Each vessel must have a written OUTBREAK Prevention and Response Plan (OPRP) that details standard procedures and policies to specifically address AGE onboard. The written OPRP must include the following at a minimum:

- Duties and responsibilities of each department and their staff for all passenger and crew public areas.
- Steps in OUTBREAK management and control and the trigger required for action at each step.

At a minimum, triggers must address a graduated approach to OUTBREAK management in response to increasing case counts. **Additionally, triggers may be based on events, such as reports of public vomiting/diarrhea, increased room service requests, meal or excursion cancellations, missed events, or others.**

Cruise ship AGE surveillance data has shown that a 0.45% daily ATTACK RATE is indicative of a pending OUTBREAK.

- DISINFECTANT products or systems used, including the surfaces or items the DISINFECTANTS will be applied to, concentrations, and required contact times. The DISINFECTANT products or systems must be effective against human norovirus or an acceptable surrogate (e.g., caliciviruses).
- Procedures for informing passengers and crew members of the OUTBREAK. This section should address the procedures for notification of passengers embarking the vessel after an OUTBREAK voyage. In the case of an extended voyage separated into segments, such as a world cruise, this requirement applies to passengers embarking for the segment after an OUTBREAK segment.
- Procedures for returning the vessel to normal operating conditions after an OUTBREAK.
- Procedures to protect the passengers and crew from exposure to DISINFECTANTS, if not already included in the vessel's safety management system. At a minimum, this must include the following:
 - Material safety data sheets (MSDSs).

- Personal protective EQUIPMENT for crew.
- Health and safety procedures to minimize respiratory and dermal exposures to both passengers and crew.

9.1.1.1.6 Public Toilet Facilities (41)

Passenger and crew public toilets (not including FOOD-area toilets) must be provided with a handwashing station that includes the following:

- Hot and cold running water.
- Soap.
- A method to dry hands (e.g., sanitary hand-drying device, paper towels).
- A sign advising users to wash hands (pictograms are acceptable).

9.1.1.1.7 Hands-Free Exit (41)

Passenger and crew public toilet facilities must be equipped so persons exiting the toilet room are not required to touch the door handle with bare hands.

Where toilet stalls include handwashing facilities, the bare-hands-free contact must begin in the toilet stall. Toilet facilities with multiple exits, such as spa dressing rooms, must have bare-hands-free contact at each exit.

Bare-hands-free contact may be accomplished by methods such as locating paper towel dispensers at sinks and waste containers near the room door, installing mechanically operated doors, removing doors, or using other effective means.

9.1.1.1.8 Sign (41)

A sign must be posted advising users of toilet facilities to use hand towel, paper towel, or tissue to open the door unless the exit is hands free.

A pictogram that illustrates the correct use and disposal of paper towels may be used in lieu of a sign.

9.2 Housekeeping Knowledge

9.2.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of housekeeping operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of housekeeping operations. The supervisor or PERSON IN CHARGE must

demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector's questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of housekeeping operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

10.0 Child Activity Centers

This section includes the following subsections:

- 10.1 Diaper Changing
- 10.2 Toilets and Handwashing
- 10.3 Cleaning and DISINFECTION
- 10.4 Exclusions
- 10.5 Knowledge

References for 10.0 Child Activity Centers can be found in Annex 14.10.

10.1 Diaper Changing

10.1.1 Diaper-Changing Facilities

10.1.1.1 Design

10.1.1.1.1 *Diaper Changing (42)*

If children who wear diapers are accepted in the CHILD ACTIVITY CENTER, diaper-changing stations and disposal facilities must be provided.

10.1.1.1.2 *Diaper-Changing Stations (42)*

Each station must include the following:

- A changing table that is nonabsorbent, nontoxic, SMOOTH, durable, EASILY CLEANABLE, and designed for diaper changing.
- A supply of disposable diapers, gloves, wipes, table cleanser, and DISINFECTANT.
- An airtight soiled-diaper receptacle.
- An adjacent handwashing station.

10.1.1.1.3 *Signs (42)*

Signs must be posted in the diaper changing area advising handwashing after each diaper change.

10.2 Toilets and Handwashing

10.2.1 Employee Handwashing (42)

Vessels constructed to the *VSP 2005 Construction Guidelines* or later must have at least one handwashing station separate from the toilet room(s). The handwashing station must be maintained clean and available at all times.

10.2.2 Facilities

Sections 9.1.1.1.6–9.1.1.1.8 also apply to this section, except that the sign advising users to wash hands (section 9.1.1.1.8) is not required.

10.2.2.1 Design

10.2.2.1.1 *Child-Size Toilet (42)*

If toilet rooms are located in a CHILD ACTIVITY CENTER, CHILD-SIZE TOILET(s) or child-ACCESSIBLE toilet(s) (child-size seat and step stool) and handwashing facilities must be provided.

CHILD-SIZE TOILETS (to include the toilet seat) must have a maximum height of 280 millimeters (11 inches) and a toilet seat opening no greater than 203 millimeters (8 inches). Handwashing sinks must have a maximum height of 560 millimeters (22 inches) above the deck or a step stool must be provided.

10.2.2.1.2 *Toilet Supplies (42)*

Each child's toilet facility must be provided with a supply of toilet tissue, disposable gloves, and sanitary wipes.

10.2.2.1.3 *Waste Receptacle (42)*

An airtight, washable waste receptacle must be conveniently located to dispose of excrement, soiled sanitary wipes, and soiled gloves. Waste materials must be removed from the CHILD ACTIVITY CENTER each day.

10.2.2.1.4 *Handwashing Supplies (42)*

Soap, paper towels or air dryers, and a waste towel receptacle must be located at handwashing stations.

10.2.2.1.5 *Signs (42)*

Signs must be posted in children's toilet room advising providers to wash their hands and the children's hands after assisting children with using the toilet.

10.2.2.1.6 *Assistance (42)*

Children under 6 years old must be assisted in washing their hands in the CHILD ACTIVITY CENTER after using the toilet room, before eating, and after otherwise contaminating their hands.

10.2.2.1.7 *Separate (42)*

Separate toilet facilities must be provided for CHILD ACTIVITY CENTER staff. CHILD ACTIVITY CENTER staff must not use the children's toilet facilities. Public toilet facilities are acceptable.

10.2.2.1.8 Exiting (41)

Toilet rooms must be equipped so that persons exiting the toilet room are not required to handle the door with bare hands.

10.2.2.2.9 Temperature (42)

The maximum water temperature for a handwashing station must not exceed 43°C (110°F).

10.2.2.2.10 Outside Toilet Rooms (42)

Handwashing stations designated for children and located outside toilet rooms must meet the requirements in sections 10.2.2.1.1 and 10.2.2.1.9.

10.3 Cleaning and Disinfection

10.3.1 Employee Handwashing

10.3.1.1 When to Wash Hands (12 C)

Child care providers must wash their hands before giving FOOD or BEVERAGES to children.

10.3.2 Furnishings and Toys

10.3.2.1 Construction

10.3.2.1.1 Cleanable (42)

Surfaces of tables, chairs, and other furnishings that children touch with their hands must be cleanable.

10.3.2.1.2 Condition (42)

Toys used in the CHILD ACTIVITY CENTER must be maintained in a clean condition.

10.3.2.2 Procedures

10.3.2.2.1 Hard Surfaces (42)

Surfaces that children touch with their hands must be cleaned and disinfected daily with products labeled by the manufacturer for that purpose.

10.3.2.2.2 Toy Cleaning/Ball Pits (42)

Toys used in the CHILD ACTIVITY CENTER must be cleaned and disinfected daily.

Balls used in ball pits/pens must be cleaned when contaminated or at least once per week.

If a CHEMICAL DISINFECTANT is used, toys must be air dried before use.

10.3.2.2.3 Tables/High Chairs (42)

Tables and high chair trays must be cleaned and disinfected before and after they are used for eating.

10.3.2.2.4 Decks (42)

Carpeting must be vacuumed daily and must be periodically cleaned when it becomes visibly soiled. Decks must be washed and disinfected when soiled or at least daily.

10.3.2.2.5 Facility Cleaning/Disinfecting (42)

Diaper changing stations, handwashing facilities, and toilet rooms must be cleaned and disinfected daily and when soiled during use.

10.3.2.2.6 Linens Laundered (42)

LINENS such as blankets, sheets, and pillow cases must be laundered between each use.

10.3.2.2.7 Costumes (42)

Costumes worn by children—including clothing items, masks, and hats—must be laundered, cleaned and disinfected, discarded, retained by the guest, or dry cleaned between each use.

10.4 Exclusions

10.4.1 Children with Infectious Illness

10.4.1.1 Procedures

10.4.1.1.1 Written Guidance (42)

Written guidance on symptoms of common childhood infectious illnesses must be posted at the entrance of the CHILD ACTIVITY CENTER.

10.4.1.1.2 Exclusion Policy (42)

The CHILD ACTIVITY CENTER must have a written exclusion policy on procedures to be followed when a child develops symptoms of an infectious illness while at the center.

The policy must include a requirement for written clearance from the medical staff before a child with symptoms of infectious illness can be allowed in the CHILD ACTIVITY CENTER.

This policy must be posted at the entrance of the CHILD ACTIVITY CENTER.

10.4.1.1.3 Infectious Illness (42)

Children with infectious illness must not be allowed in the CHILD ACTIVITY CENTER without written permission from the vessel's medical staff.

10.5 Child Activity Center Knowledge

10.5.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of CHILD ACTIVITY CENTER operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of CHILD ACTIVITY CENTER operations. The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector's questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of CHILD ACTIVITY CENTER operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

11.0 Heating, Ventilation, and Air Conditioning (HVAC) Systems, Fountains, Misting Systems, Humidifiers, and Showers

This section includes the following subsections:

- 11.1 HVAC Construction and Maintenance
- 11.2 Fountains, Humidifiers, Misting Systems, and Showers
- 11.3 Knowledge

References for 11.0 Heating, Ventilation, and Air Conditioning (HVAC) Systems, Fountains, Misting Systems, Humidifiers, and Showers can be found in Annex 14.11.

11.1 HVAC Construction and Maintenance

11.1.1 Construction

11.1.1.1 Condensate Pans (43)

Air handling unit condensate drain pans and collection systems must be able to be accessed for inspection, maintenance, and cleaning. Installation of sight windows or other effective methods for full inspection of condensate collection pans must be used when original EQUIPMENT access makes evaluation during operational inspections impractical.

11.1.1.2 Self Draining (43)

Condensation collection pans must be self draining.

11.1.1.3 Potable Water (43)

Only POTABLE WATER can be used for cleaning the HVAC distribution system.

11.1.2 Maintenance

11.1.2.1 Air Handling Units (43)

Air handling units must be kept clean.

11.1.2.2 Condensers (43)

Evaporative condensers must be inspected at least annually and cleaned as necessary to remove scale and sediment. Cooling coils and condensate pans must be cleaned as necessary to remove dirt and organic material.

11.1.2.3 Inspection and Maintenance Plan (43)

Vessels must have a plan to inspect and maintain HVAC systems in accordance with the manufacturer's recommendations and industry standards. The written inspection, cleaning, and maintenance plan for the HVAC system must be maintained on the vessel and available for review during inspections.

Documentation of the inspection, cleaning, and maintenance plan must be available for review during inspections.

An electronic maintenance tracking system is acceptable for both the plan and the documentation if the work description and action completed are available.

11.2 Fountains, Humidifiers, Misting Systems, and Showers

11.2.1 Fountains, Humidifiers, and Misting Systems

11.2.1.1 Water Source

11.2.1.1.1 Sprays (43)

Only POTABLE WATER can be used for water sprays, decorative fountains, humidifiers, and misting systems. The water must be further treated to avoid microbial buildup in the operation of water sprays, fountains, humidifiers, and misting systems.

11.2.1.2 Fountains and Misting Systems

11.2.1.2.1 Clean (43)

Decorative fountains and misting systems must be maintained free of *Mycobacterium*, *Legionella*, algae, and mold growth.

For systems installed after the adoption of the *VSP 2011 Operations Manual*,

- Provide an automated treatment system (halogenation, UV, or other effective DISINFECTANT) to prevent the growth of *Mycobacterium* and *Legionella* in any decorative fountain, misting system, or similar facility.
- Ensure that nozzles are REMOVABLE for cleaning and DISINFECTION.
- Ensure that pipes and reservoirs can be drained when the fountain/system is not in use.

PORTABLE units must be maintained clean.

11.2.1.2.2 Shock Treatment (43)

For misting systems and similar facilities, ensure that these systems can also be manually disinfected (halogenation, heat, etc.).

If heat is used as a DISINFECTANT, ensure that the water temperature, as measured at the misting nozzle, can be maintained at 65°C (149°F) for a minimum of 10 minutes.

11.2.2 Hot-Water System and Showers

11.2.2.1 Maintenance

11.2.2.1.1 Hot-Water System (43)

The potable hot-water system—including shower heads—must be maintained to preclude growth of *Mycobacterium* or *Legionella*.

11.2.2.1.2 Showers (43)

Shower heads must be cleaned and disinfected every 6 months. DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT at 10 ppm for 60 minutes, or an equivalent CT VALUE.

Shower head cleaning and DISINFECTION must be recorded in a log and maintained on the vessel.

11.3 HVAC Systems, Fountains, Misting Systems, Humidifiers, and Showers Knowledge

11.3.1 Demonstration of Knowledge (44)

The supervisor or PERSON IN CHARGE of HVAC operations on the vessel must demonstrate to VSP—on request during inspections—knowledge of HVAC systems, fountains, misting systems, humidifiers, and showers operations. The supervisor or PERSON IN CHARGE must demonstrate this knowledge by compliance with this section of these guidelines or by responding correctly to the inspector's questions as they relate to the specific operation. In addition, the supervisor or PERSON IN CHARGE of HVAC systems, fountains, misting systems, humidifiers, and showers operations on the vessel must ensure that employees are properly trained to comply with this section of the guidelines in this manual as it relates to their assigned duties.

12.0 Administrative Guidelines

This section includes the following subsections:

- 12.1 Inspections
- 12.2 Inspection Report
- 12.3 Risk-based Scoring and Correction Priority
- 12.4 Closing Conference
- 12.5 Inspection Review
- 12.6 Corrective Action Statement
- 12.7 Correction Affidavit
- 12.8 Inspection Publication
- 12.9 Recommendation That the Vessel Not Sail
- 12.10 Reinspections and Follow-up Inspections
- 12.11 Construction/Renovation Inspections
- 12.12 Other Environmental Investigations
- 12.13 VARIANCES

References for 12.0 Administrative Guidelines can be found in Annex 14.12.

12.1 Inspections

12.1.1 Inspection Procedures

12.1.1.1 Routine Inspections

An unannounced, complete sanitation inspection by VSP Environmental Health Officers (EHOs) will be done twice each federal fiscal year if the vessel is available.

12.1.1.2 IHR Ship Sanitation Inspections

The Vessel Sanitation Program will conduct International Health Regulations (IHR) ship sanitation inspections during unannounced routine operational inspections of cruise ships using the final APPROVED IHR inspection manual from the World Health Organization (WHO). The IHR inspection will only be conducted if there is sufficient time to do both inspections while the ship is in port. There will be no additional fee charged for a dual inspection. The IHR inspection will not be conducted if the cruise line involved has invoices from other ship inspections unpaid for more than 60 days from receipt of those invoices.

VSP will also provide extensions to existing ship sanitation control exemption certificates. Because the standard for the IHR inspections is set by WHO, the ship will be issued the certificate appropriate to the findings of the inspection. The findings specific to the IHR will be so designated in the inspection report narrative.

12.1.1.3 Inspectors

VSP EHOs will be trained in the interpretation and application of the current *VSP Operations Manual*.

12.1.1.4 Boarding

The VSP EHO or EHOs will board the vessel and immediately inform the master of the vessel or a designated agent that a vessel sanitation inspection is to be conducted.

12.1.1.5 Sequence

The VSP EHO or EHOs will then conduct the inspection in a logical sequence until all areas identified in this manual have been inspected.

12.1.1.6 Imminent Health Hazard Detection

The VSP EHO or EHOs will contact the master of the vessel or a designated agent and the VSP Chief immediately during an inspection about a possible recommendation that the vessel not sail

- If an IMMEDIATE HEALTH HAZARD as specified in section 12.9.1 is found to exist on the vessel AND
- If these deficiencies possibly cannot be corrected before the inspection is completed.

12.1.1.7 Incomplete Inspections

Once an inspection has begun, it will be completed in that same visit. If the inspection cannot be completed, the results of an incomplete inspection will be discussed with the vessel's staff. A complete inspection will be conducted at a later date.

12.2 Inspection Report

12.2.1 Draft Report

12.2.1.1 Provided

The VSP EHO or EHOs will provide a draft inspection report to the master of the vessel, or a designated agent, at the conclusion of the inspection.

12.2.1.2 Information

The draft inspection report will provide administrative information, AGE log review details, and inspection score.

12.2.1.3 Deficiency Descriptions

The draft inspection report will provide a written description of the items found deficient and where the deficiency was observed.

12.2.2 Final Report

12.2.2.1 Report Form

The VSP EHO or EHOs will use the Vessel Sanitation Inspection Report (Annex 13.17) to summarize the inspection score. The inspection report will contain the elements in 12.2.2.2 through 12.2.2.5.

12.2.2.2 Administrative

The inspection report includes administrative information that identifies the vessel and its master or designee. It also includes the inspection report score, which is calculated by subtracting credit point values for all observed deficiencies from 100.

12.2.2.3 Deviations

The item number and the credit point value for that item number will be indicated if the vessel does not meet the current *VSP Operations Manual* standard for that item.

12.2.2.4 Medical Review

The medical documentation (e.g., GI logs, medical logs, special reports, etc.) will be available for review by VSP for accuracy and timeliness of reporting.

12.2.2.5 Report Detail

A written description of the items found deficient will be included. The deficiencies will be itemized with references to the section of the current *VSP Operations Manual*. The description will include the deficiency location and citation of the appropriate *VSP Operations Manual* section.

12.3 Risk-Based Scoring and Correction Priority

12.3.1 Scoring System

12.3.1.1 Weighted Items

The inspection report scoring system is based on inspection items with a total value of 100 points.

12.3.1.2 Risk Based

Inspection items are weighted according to their probability of increasing the risk for an AGE OUTBREAK.

12.3.1.3 Critical Items

CRITICAL ITEMS are those with a weight of 3 to 5 credit point values on the inspection report.

12.3.1.4 Critical Designation

CRITICAL ITEMS are designated in this *VSP Operations Manual* in bold red underlined text. In addition, the text **CRITICAL ITEM** appears in parentheses after the section number and keywords; for example, **7.5.5.1 Food-Contact Surfaces (24 C)**. The section numbers of the CRITICAL ITEMS in this manual are also provided in red text.

12.3.1.5 Noncritical Items

Noncritical items are those with a weight of 1 to 2 credit point values on the inspection report.

12.3.1.6 Scoring

Each weighted deficiency found on an inspection will be deducted from 100 possible credit points.

12.3.2 Risk-Based Correction Priority

12.3.2.1 Critical Correction Time Frame

At the time of inspection, a vessel will correct a critical deficiency as defined in the current *VSP Operations Manual* and implement a corrective-action plan for monitoring the CRITICAL ITEM for continued compliance.

12.3.2.2 Extension

Considering the nature of the potential HAZARD involved and the complexity of the corrective action needed, VSP may agree to, or specify, a longer time frame (not to exceed 10 calendar days after the inspection) for the vessel to correct critical deficiencies.

12.4 Closing Conference

12.4.1 Procedures

12.4.1.1 Closing Conference

The results of the inspection will be explained to the master or a designee before the VSP EHO or EHOs leave the vessel.

12.4.1.2 Report Copy

The VSP EHO or EHOs will leave a copy of the draft inspection report with the master or designee. The report will be reviewed in detail and opportunity provided for discussions of the findings. The draft report is provided so vessel personnel can begin correcting deficiencies immediately.

12.4.1.3 Invoice

The VSP EHO or EHOs will provide the master or a designee with a payment invoice for signature. The VSP EHO or EHOs will provide one copy of the signed invoice to the master or designee and will forward one copy to the vessel's company office along with the final inspection report.

12.4.1.4 Fee Schedule

The fee for inspections is based on the existing fee schedule for routine inspections of passenger cruise vessels. The schedule is published annually in the *Federal Register*.

12.5 Inspection Review

12.5.1 Inspection Report Review Requests

12.5.1.1 Contested Results

The vessel owner or operator must notify VSP within 72 hours of the inspection closing conference of their intent to contest results of the inspection. After the initial notification and within 2 weeks of the inspection, the vessel owner or operator must provide VSP with the specific reference and facts concerning the contested deficiencies documented by the VSP EHO or EHOs during the inspection.

12.5.1.2 Interim Report

At the request of the owner or operator, the VSP EHO or EHOs will complete an interim report if an inspection is under review. The interim report will indicate the item(s) under review. VSP will modify the final inspection report, as necessary, after the review by the VSP Chief.

12.5.1.3 Report Remarks

After receiving a request for review, the VSP EHO or EHOs will mark the vessel's inspection report as under review at the request of the vessel owner or operator.

12.5.1.4 Address

Send written requests to the following:
Chief, Vessel Sanitation Program
National Center for Environmental Health
Centers for Disease Control and Prevention
4770 Buford Hwy NE, Mailstop F59
Atlanta, GA 30341-3717 USA

12.5.2 Inspection Report Review Procedures

12.5.2.1 Review

The VSP Chief will review the matter and respond within 2 weeks of receiving the request for a review. In the response, the VSP Chief will state whether the inspection report will be changed.

12.5.2.2 No Score

No numerical score will be published before the VSP Chief makes a final determination on the review. Publication of inspection results will indicate the vessel's status as under review at the request of the vessel owner or operator.

12.5.2.3 Report Copies

Copies of the contested inspection results released before the VSP Chief makes a final determination on the review will have each contested deficiency clearly marked as under review at the request of the vessel owner or operator.

12.5.2.4 Final Report

The interim report will be issued as a final report if the written request for review is not received within 2 weeks of the inspection.

12.5.2.5 Appeal

If the ship owner does not agree with the review and decision of the VSP Chief, he or she may appeal the decision to the Director, Division of Emergency and Environmental Health Services, National Center for Environmental Health.

12.5.3 Other Recommendations Review

12.5.3.1 Review

A vessel owner or operator has the right to request a review of recommendations made during a technical consultation or inspection if the owner or operator believes VSP officials have imposed requirements inconsistent with or beyond the scope of this manual.

12.5.3.2 Written Request

The owner or operator must send a written statement explaining the problem in detail to the VSP Chief within 30 days of the date the recommendation was made.

12.5.3.3 Review

The VSP Chief will review the issue and respond within 2 weeks of receiving the statement, advising whether the recommendation will be revised.

12.5.3.4 Appeal

If the ship owner does not agree with the review and decision of the VSP Chief, he or she may appeal the decision to the Director, Division of Emergency and Environmental Health Services, National Center for Environmental Health.

12.6 Corrective Action Statement

12.6.1 Procedures

12.6.1.1 Corrective Actions

Signed corrective-action statements (Annex 13.18) must be submitted to the VSP Chief by the master, owner, or operator. Corrective-action statements must detail each deficiency identified during the inspection and the corrective action taken.

Corrective-action statements (Annex 13.18) must be submitted to the VSP Chief by the master, owner, or operator within 2 weeks of receiving the final inspection report.

12.6.1.2 Critical-Item Corrective Actions

Critical-item deficiencies must also include standard operating procedures and monitoring procedures implemented to prevent the recurrence of the critical deficiency.

12.6.1.3 Clarification Requests

The corrective-action statement may contain requests for clarification of items noted on the inspection report. The request for clarification must be included in the cover letter from the vessel's master, owner, or operator. Clarification of these items will be provided in writing to the requestor by the VSP Chief or the EHO or EHOs who conducted the inspection in question.

12.6.1.4 Public Distribution

The corrective-action statement will be appended to the final inspection report for future reference and, if requested, made available for public distribution.

12.6.1.5 Same Score

A corrective-action statement will not affect the inspection score.

12.7 Correction Affidavit

12.7.1 Procedures

12.7.7.1 Procedures

An affidavit of correction from the owner or operator, certifying that corrective action has been completed, may be submitted to the VSP Chief. The procedure may be used only one time for an item. The item must be structure- or EQUIPMENT-related and must be corrected within a reasonable period.

12.7.1.2 Conditions

At least one of the following conditions must apply for an item to qualify for an affidavit of correction. The item must be a

- Longstanding deficiency that has not been identified during previous inspections OR
- Deficiency in which the function of the EQUIPMENT is being accomplished by an alternative method.

12.7.1.3 Requested at Inspection

After the inspection, but before the VSP EHO or EHOs leave the vessel, the vessel's master or a representative must provide notification of the intent to submit an affidavit of correction. This notice must specify the deficiency or deficiencies to be corrected and the corrective action to be taken. The draft inspection report will include a notation of the items to be corrected.

12.7.1.4 Final Inspection Score

After acceptance of the affidavit, the final inspection score will be recalculated to include credit for the items corrected.

12.8 Inspection Publication

12.8.1 Methods

12.8.1.1 Report Availability on Website

CDC publishes inspection reports and scores (the Green Sheet report) on the VSP website (www.cdc.gov/nceh/vsp).

12.8.1.2 Data

The website will include, at a minimum, the names of the vessels in the inspection program, the dates of their most recent inspections, and the numerical score achieved by each vessel.

12.8.1.3 Public Record

Reports, including corrective-action statements, are available on the VSP website. Paper copies are available to the public on request.

12.9 Recommendation That the Vessel Not Sail

12.9.1 Imminent Health Hazards

12.9.1.1 Imminent Health Hazard

An IMMEDIATE HEALTH HAZARD will be determined to be, but not limited to, one of the following situations:

- Free HALOGEN residual in the POTABLE WATER distribution system is less than 0.2 MG/L (ppm) and this deficiency is not corrected before the inspection ends.
- Inadequate facilities for maintaining safe temperatures for POTENTIALLY HAZARDOUS FOOD.
- Inadequate facilities for cleaning and sanitizing EQUIPMENT.
- Continuous problems with liquid and solid waste disposal, such as inoperative or overflowing toilets or shower stalls in passenger and crew member cabins.
- Infectious disease OUTBREAK among passengers or crew, and where it is suspected that continuing normal operations may subject newly arriving passengers to disease.

12.9.2 Procedures

12.9.2.1 Notify VSP Chief

The VSP EHO or EHOs will immediately notify the VSP Chief when any of these IMMEDIATE HEALTH HAZARDS or similar imminent threats to public health are found aboard a vessel.

12.9.2.2 No Sail

CDC will recommend or direct the master of a vessel not to sail when an IMMEDIATE HEALTH HAZARD is identified and cannot be immediately corrected. Such a recommendation will be signed by the VSP Chief, with concurrence of the Director, National Center for Environmental Health/Agency for Toxic Substances and Disease Registry or the Director's designee.

12.10 Reinspection and Follow-up Inspections

12.10.1 Reinspection Procedures

12.10.1.1 Failing Vessels Reinspections

A reinspection is a complete sanitation inspection performed on vessels that did not score at least 86 on the previous inspection.

12.10.1.2 Reasonable Time

Vessels that fail a routine inspection will be reinspected within a reasonable time, depending on vessel schedules and receipt of the corrective-action statement from the vessel's management.

12.10.1.3 Unannounced

Reinspections will be unannounced.

12.10.1.4 No-Sail Reinspections

If a no-sail recommendation is made, a follow-up inspection will be conducted as soon as requested.

12.10.1.5 Scheduling Priority

In scheduling inspections, VSP will give priority to the reinspection of vessels that failed routine inspections.

12.10.1.6 One Reinspection

Vessels that fail a routine inspection will undergo only one reinspection.

12.10.1.7 Written Requests

Exceptions to 12.10.1.6 may be made when the owner or operator submits a written request for an additional reinspection to the VSP Chief stating why the additional reinspection is warranted.

12.10.1.8 Unannounced/Inspection Fee

Additional reinspections are unannounced and the vessel will be charged the standard inspection fee.

12.10.2 Followup Inspection Procedures

12.10.2.1 Follow Up

A follow-up inspection is a partial inspection to review the status of deficiencies identified during the previous periodic inspection or reinspection.

12.10.2.2 Not Periodic or Reinspection

A follow-up inspection cannot be a substitute for a periodic inspection or reinspection.

12.10.2.3 Followup Reasons

Follow-up inspections may be conducted to resolve a contested inspection or to inspect IMMEDIATE HEALTH HAZARDS that resulted in a recommendation to prohibit the vessel from sailing.

12.10.2.4 Next Arrival

These inspections will be conducted as soon as possible after the routine inspection or reinspection, preferably the next time the vessel arrives at a U.S. port.

12.10.2.5 Limited

Follow-up inspections will be limited to inspection of deficiencies in question. For example, if an item under the refrigerator section of the inspection was a deficiency and was the only item contested, only refrigeration would be checked during the follow-up inspection.

12.10.2.6 Other Items

Any other problems noted during the follow-up inspection will be brought to the attention of the vessel's master or designee so the deficiencies can be corrected.

12.10.2.7 No Score

No inspection score will be provided and no fee will be charged for follow-up inspections.

12.11 Construction/Renovation Inspections

12.11.1 Procedures

12.11.1.1 Construction

Whenever possible, VSP staff will conduct inspections of vessels being constructed or undergoing major retrofits on request of the vessel owner or operator.

12.11.1.2 Requesting Inspection

An official written request will be submitted to the VSP Chief requesting a voluntary construction renovation inspection. CDC's ability to honor these requests will be based on the availability of the VSP staff.

12.11.1.3 Time Frame

Construction/renovation inspections are normally conducted at the shipyard 4 to 6 weeks before completion. An additional inspection may also be conducted on completion of the work and before the vessel enters operational status.

12.11.1.4 Construction Compliance

Construction/renovation inspections will document the vessel's compliance with CDC's *VSP Construction Guidelines*, which provide a framework for consistency in the sanitary design, construction, and construction inspections of cruise vessels.

12.11.1.5 New Vessels

The CDC *VSP 2018 Construction Guidelines* will apply to all new vessels in which the keel is laid after **June 1, 2018**.

12.11.1.6 Major Renovations

The construction guidelines will also apply to major renovations planned after **June 1, 2018**. A major renovation is a renovation where a new FOOD AREA (e.g., galley, bar, buffet) is installed, a new facility (e.g., recreational water, CHILD ACTIVITY CENTER) is installed, or an existing FOOD AREA or facility is changed by size or EQUIPMENT by 30% or more from the original. It also includes the addition of or change to an area/facility or a technical system (e.g., POTABLE WATER, wastewater, air systems) through the introduction of new technology.

12.11.1.7 Minor Renovations

These guidelines will not apply to minor renovations.

12.11.1.8 Fee Schedule

The fee for construction/renovation inspections is based on the existing fee schedule for routine inspections.

12.11.2 Construction/Renovation Inspection Reports

12.11.2.1 Report

A written report will be issued by VSP after a construction/renovation inspection. These reports will summarize any changes recommended to ensure conformity with CDC guidelines.

12.11.2.2 Guides

The reports prepared by VSP personnel in the shipyards during construction will be used as guides if VSP conducts a final construction/renovation inspection on the vessel before the vessel enters operational service.

12.11.2.3 No Score

There is no score for construction/renovation inspections.

12.12 Other Environmental Investigations

12.12.1 Procedures

12.12.1.1 Environmental Investigations

VSP may conduct or coordinate other activities such as investigating disease OUTBREAKS, checking a specific condition such as HALOGEN residual in the POTABLE WATER distribution system, or investigating complaints of unsanitary conditions on a vessel.

12.12.1.2 Problems Noted

Public health problems noted during other environmental investigations will be brought to the attention of the vessel's master or designee when these investigations are performed.

12.12.1.3 No Score

No inspection score will be provided and no fee will be charged for other environmental investigations.

12.13 Variances

12.13.1 Procedures

12.13.1.1 Variance Procedures

VSP may grant a VARIANCE by modifying or waiving the requirements of this *VSP 2018 Operations Manual* if VSP determines that a HEALTH HAZARD or nuisance will not result from the VARIANCE.

12.13.1.2 VSP Records

If a VARIANCE is granted, VSP will retain the information in its records for the vessel or, if applicable, multiple vessels.

12.13.1.3 Vessel Records

If a VARIANCE is granted, the vessel using the VARIANCE must retain the information in its records for ready reference.

12.13.1.4 Existing Variances

If changes are submitted for an existing APPROVED VARIANCE, the entire VARIANCE will be reviewed. If a new vessel is added to an existing APPROVED VARIANCE, the VARIANCE will be reviewed for that vessel.

If new technology or science has been developed since approval of a VARIANCE, that section of the VARIANCE where the new technology or science was developed will be reviewed.

12.13.2 Documentation

12.13.2.1 Detailed Justification

Before a VARIANCE from a requirement of the *VSP 2018 Operations Manual* is APPROVED, the person requesting the VARIANCE must provide the following, which will be retained in VSP's file on the vessel or vessels:

- A statement of the proposed VARIANCE from the *VSP 2018 Operations Manual* requirement including relevant section number citations.
- An analysis of the rationale for how the potential public health HAZARDS and nuisances addressed by the relevant *VSP 2018 Operations Manual* requirement will be alternatively addressed by the proposed VARIANCE.
- If required, a HACCP PLAN, standard operating procedures, training plan, and monitoring plan that includes all the information as it is relevant to the VARIANCE requested.
- Additional scientific data or other information as required to support the determination that public health will not be compromised by the proposal.

12.13.3 Conformance

12.13.3.1 Conformance

If VSP grants a VARIANCE, the vessel must

- Comply with the HACCP PLANS, standard operating procedures, training plan, and monitoring plan submitted and APPROVED as a basis for the modification or waiver.
- Maintain and provide to VSP, on request, records to demonstrate that
 - procedures monitoring CRITICAL CONTROL POINTS are effective,
 - monitoring of the CRITICAL CONTROL POINT are routinely used,
 - necessary corrective actions are taken if there is failure at a CRITICAL CONTROL POINT, and
 - effectiveness of the operation or process in protection of public health is periodically verified.

12.13.3.2 Rescinding Variance

VARIANCE approval may be rescinded at any time for noncompliance with these conditions or if it is determined that public health could be compromised.

12.13.3.3 Areas Not Identified (44)

Procedures, systems, EQUIPMENT, technology, processes, or activities not identified in the scope of this manual must not be tested or introduced operationally onboard any vessel until the concept is submitted in writing to the VSP Chief for review. If the review determines the concept is within the scope of the *VSP Operations Manual*, written procedures, control measures, or a complete VARIANCE submission may be required.

13.0 Annexes

This section includes the following subsections:

- 13.1 Authority
- 13.2 ACUTE GASTROENTERITIS Surveillance System
- 13.3 ACUTE GASTROENTERITIS Surveillance System Reporting
- 13.4 ACUTE GASTROENTERITIS OUTBREAK Investigation
- 13.5 DISINFECTION Calculations for Water and EQUIPMENT
- 13.6 Potable Water Pipe and System Disinfection Method Examples
- 13.7 Sample CROSS-CONNECTION Control Program Guideline
- 13.8 BABY-ONLY WATER FACILITY
- 13.9 Fecal, Vomit, and Blood Accident Response for RWFs
- 13.10 Cartridge Filter Cleaning Procedures
- 13.11 FOOD Cooking Temperature Alternatives
- 13.12 Chemicals Used in Washing or to Assist in the Peeling of Fruits and Vegetables
- 13.13 TIME-CONTROL Plan Examples
- 13.14 List of Some Hard and Semisoft Cheeses Exempt from Datemarking
- 13.15 CONSUMER Advisory Examples
- 13.16 WAREWASHING Evaluation
- 13.17 Inspection Report
- 13.18 Corrective-Action Statement
- 13.19 Summary of Sanitation Inspections of International Cruise Ships

13.1 Authority

13.1.1 Public Health Service Act

CHAPTER 6A--PUBLIC HEALTH SERVICE SUBCHAPTER II--GENERAL POWERS AND DUTIES

Part G--Quarantine and Inspection

Sec. 264. Regulations to control communicable diseases

(a) Promulgation and enforcement by Surgeon General

The Surgeon General, with the approval of the Secretary, is authorized to make and enforce such regulations as in his judgment are necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the States or possessions, or from one State or possession into any other State or possession. For purposes of carrying out and enforcing such regulations, the Surgeon General may provide for such inspection, fumigation, disinfection, sanitation, pest extermination, destruction of animals or articles found to be so infected or contaminated as to be sources of dangerous infection to human beings, and other measures, as in his judgment may be necessary.

(b) Apprehension, detention, or conditional release of individuals

Regulations prescribed under this section shall not provide for the apprehension, detention, or conditional release of individuals except for the purpose of preventing the introduction, transmission, or spread of such communicable diseases as may be specified from time to time in Executive orders of the President upon the recommendation of the National Advisory Health Council and the Surgeon General.

(c) Application of regulations to persons entering from foreign countries

Except as provided in subsection (d) of this section, regulations prescribed under this section, insofar as they provide for the apprehension, detention, examination, or conditional release of individuals, shall be applicable only to individuals coming into a State or possession from a foreign country or a possession.

(d) Apprehension and examination of persons reasonably believed to be infected

On recommendation of the National Advisory Health Council, regulations prescribed under this section may provide for the apprehension and examination of any individual reasonably believed to be infected with a communicable disease in a communicable stage and (1) to be moving or about to move from a State to another State; or (2) to be a probable source of infection to individuals who, while infected with such disease in a communicable stage, will be moving from a State to another State. Such regulations may provide that if upon examination any such individual is found to be infected, he may be detained for such time and in such manner as may be reasonably necessary. For purposes of this subsection, the term "State" includes, in addition to the several States, only the District of Columbia.

(July 1, 1944, ch. 373, title III, Sec. 361, 58 Stat. 703; 1953 Reorg. Plan No. 1, Secs. 5, 8, eff. Apr. 11, 1953, 18 F.R. 2053, 67 Stat. 631; July 12, 1960, Pub. L. 86-624, Sec. 29(c), 74 Stat. 419; June 23, 1976, Pub. L. 94-317, title III, Sec. 301(b)(1), 90 Stat. 707.)

Sec. 269. Bills of Health

(a) Detail of medical officer; conditions precedent to issuance; consular officer to receive fees

Except as otherwise prescribed in regulations, any vessel at any foreign port or place clearing or departing for any port or place in a State or possession shall be required to obtain from the consular officer of the United States or from the Public Health Service officer, or other medical officer of the United States designated by the Surgeon General, at the port or place of departure, a bill of health in duplicate, in the form prescribed by the Surgeon General. The President, from time to time, shall specify the ports at which a medical officer shall be stationed for this purpose. Such bill of health shall set forth the sanitary history and condition of said vessel, and shall state that it has in all respects complied with the regulations prescribed pursuant to subsection (c) of this section. Before granting such duplicate bill of health, such consular or medical officer shall be satisfied that the matters and things therein stated are true. The consular officer shall be entitled to demand and receive the fees for bills of health and such fees shall be established by regulation.

(b) Collectors of customs to receive originals; duplicate copies as part of ship's papers

Original bills of health shall be delivered to the collectors of customs at the port of entry. Duplicate copies of such bills of health shall be delivered at the time of inspection to quarantine officers at such port. The bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

(c) Regulations to secure sanitary conditions of vessels

The Surgeon General shall from time to time prescribe regulations, applicable to vessels referred to in subsection (a) of this section for the purpose of preventing the introduction into the States or possessions of the United States of any communicable disease by securing the best sanitary condition of such vessels, their cargoes, passengers, and crews. Such regulations shall be observed by such vessels prior to departure, during the course of the voyage, and also during inspection, disinfection, or other quarantine procedure upon arrival at any United States quarantine station.

(d) Vessels from ports near frontier

The provisions of subsections (a) and (b) of this section shall not apply to vessels plying between such foreign ports on or near the frontiers of the United States and ports of the United States as are designated by treaty.

(e) Compliance with regulations

It shall be unlawful for any vessel to enter any port in any State or possession of the United States to discharge its cargo, or land its passengers, except upon a certificate of the quarantine officer that regulations prescribed under subsection (c) of this section have in all respects been complied with by such officer, the vessel, and its master. The master of every such vessel shall deliver such certificate to the collector of customs at the port of entry, together with the original bill of health and other papers of the vessel. The certificate required by this subsection shall be procurable from the quarantine officer, upon arrival of the vessel at the quarantine station and satisfactory inspection thereof, at any time within which quarantine services are performed at such station.

(July 1, 1944, ch. 373, title III, Sec. 366, 58 Stat. 705.)

Sec. 271. Penalties for violation of quarantine laws

(a) Penalties for persons violating quarantine laws

Any person who violates any regulation prescribed under sections 264 to 266 of this title, or any provision of section 269 of this title or any regulation prescribed thereunder, or who enters or departs from the limits of any quarantine station, ground, or anchorage in disregard of quarantine rules and regulations or without permission of the quarantine officer in charge, shall be punished by a fine of not more than \$1,000 or

by imprisonment for not more than one year, or both.

(b) Penalties for vessels violating quarantine laws

Any vessel which violates section 269 of this title, or any regulations thereunder or under section 267 of this title, or which enters within or departs from the limits of any quarantine station, ground, or anchorage in disregard of the quarantine rules and regulations or without permission of the officer in charge, shall forfeit to the United States not more than \$5,000, the amount to be determined by the court, which shall be a lien on such vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States attorney shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

(c) Remittance or mitigation of forfeitures

With the approval of the Secretary, the Surgeon General may, upon application therefore, remit or mitigate any forfeiture provided for under subsection (b) of this section, and he shall have authority to ascertain the facts upon all such applications.

(July 1, 1944, ch. 373, title III, Sec. 368, 58 Stat. 706; June 25, 1948, ch. 646, Sec. 1, 62 Stat. 909; 1953 Reorg. Plan No. 1, Secs. 5, 8, eff. Apr. 11, 1953, 18 F.R. 2053, 67 Stat. 631.)

13.1.2 Title 42 Code of Federal Regulations

**TITLE 42--PUBLIC HEALTH
CHAPTER I--PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH
AND HUMAN SERVICES
PART 71--FOREIGN QUARANTINE**

Subpart C--Notice of Communicable Disease Prior to Arrival

71.21 Radio report of death or illness.

(a) The master of a ship destined for a U.S. port shall report immediately to the quarantine station at or nearest the port at which the ship will arrive, the occurrence, on board, of any death or any ill person among passengers or crew (including those who have disembarked or have been removed) during the 15-day period preceding the date of expected arrival or during the period since departure from a U.S. port (whichever period of time is shorter).

(b) The commander of an aircraft destined for a U.S. airport shall report immediately to the quarantine station at or nearest the airport at which the aircraft will arrive, the occurrence, on board, of any death or ill person among passengers or crew.

(c) In addition to paragraph (a) of this section, the master of a ship carrying 13 or more passengers must report by radio 24 hours before arrival the number of cases (including zero) of diarrhea in passengers and crew recorded in the ship's medical log during the current cruise. All cases of diarrhea that occur after the 24 hour report must also be reported not less than 4 hours before arrival.

(Approved by the Office of Management and Budget under control number 0920-0134)

Subpart D--Health Measures at U.S. Ports: Communicable Diseases
Sec. 71.31 General provisions.

(a) Upon arrival at a U.S. port, a carrier will not undergo inspection unless the Director determines that a failure to inspect will present a threat of introduction of communicable diseases into the United States, as may exist when the carrier has on board individual(s) reportable in accordance with Sec. 71.21 or meets the circumstances described in Sec. 71.42. Carriers not subject to inspection under this section will be subject to sanitary inspection under Sec. 71.41 of this part.

(b) The Director may require detention of a carrier until the completion of the measures outlined in this part that are necessary to prevent the introduction or spread of a communicable disease. The Director may issue a controlled free pratique to the carrier stipulating what measures are to be met, but such issuance does not prevent the periodic boarding of a carrier and the inspection of persons and records to verify that the conditions have been met for granting the pratique.

Sec. 71.32 Persons, carriers, and things.

(a) Whenever the Director has reason to believe that any arriving person is infected with or has been exposed to any of the communicable diseases listed in paragraph (b) of this section, he/she may detain, isolate, or place the person under surveillance and may order disinfection or disinfestation as he/she considers necessary to prevent the introduction, transmission, or spread of the listed communicable diseases.

(b) The communicable diseases authorizing the application of sanitary, detention, and/or isolation measures under paragraph (a) of this section are: cholera or suspected cholera, diphtheria, infectious tuberculosis, plague, suspected smallpox, yellow fever, or suspected viral hemorrhagic fevers (Lassa, Marburg, Ebola, Congo-Crimean, and others not yet isolated or named).

(c) Whenever the Director has reason to believe that any arriving carrier or article or thing on board the carrier is or may be infected or contaminated with a communicable disease, he/she may require detention, disinsection, disinfection, disinfestation, fumigation, or other related measures respecting the carrier or article or thing as he/she considers necessary to prevent the introduction, transmission, or spread of communicable diseases.

Sec. 71.33 Persons: Isolation and surveillance.

(a) Persons held in isolation under this subpart may be held in facilities suitable for isolation and treatment.

(b) The Director may require isolation where surveillance is authorized in this subpart whenever the Director considers the risk of transmission of infection to be exceptionally serious.

(c) Every person who is placed under surveillance by authority of this subpart shall, during the period of surveillance:

(1) Give information relative to his/her health and his/her intended destination and report, in person or by telephone, to the local health officer having jurisdiction over the areas to be visited, and report for medical examinations as may be required;

(2) Upon arrival at any address other than that stated as the intended destination when placed under surveillance, or prior to departure from the United States, inform, in person or by telephone, the health officer serving the health jurisdiction from which he/she is departing.

(d) From time to time the Director may, in accordance with section 322 of the Public Health Service Act, enter into agreements with public or private medical or hospital facilities for providing care and treatment for persons detained under this part.

(Approved by the Office of Management and Budget under control number 0920-0134) [50 FR 1519, Jan. 11, 1985; 50 FR 3910, Jan. 29, 1985]

Sec. 71.34 Carriers of U.S. military services.

(a) Carriers belonging to or operated by the military services of the United States may be exempted from inspection if the Director is satisfied that they have complied with regulations of the military services which also meet the requirements of the regulations in this part. (For applicable regulations of the military services, see Army Regulation No. 40-12, Air Force Regulation No. 161-4, Secretary of the Navy Instruction 6210.2, and Coast Guard Commandant Instruction 6210.2).

(b) Notwithstanding exemption from inspection of carriers under this section, animals or articles on board shall be required to comply with the applicable requirements of subpart F of this part.

Sec. 71.35 Report of death or illness on carrier during stay in port.

The master of any carrier at a U.S. port shall report immediately to the quarantine station at or nearest the port the occurrence, on board, of any death or any ill person among passengers or crew.

(Approved by the Office of Management and Budget under control number 0920-0134)

Subpart E--Requirements Upon Arrival at U.S. Ports: Sanitary Inspection

Sec. 71.41 General provisions.

Carriers arriving at a U.S. port from a foreign area shall be subject to a sanitary inspection to determine whether there exists rodent, insect, or other vermin infestation, contaminated FOOD or water, or other insanitary conditions requiring measures for the prevention of the introduction, transmission, or spread of communicable disease.

Sec. 71.45 FOOD, potable water, and waste: U.S. seaports and airports.

(a) Every seaport and airport shall be provided with a supply of potable water from a watering point approved by the Commissioner of FOOD and Drugs, FOOD and Drug Administration, in accordance with standards established in title 21, Code of Federal Regulations, parts 1240 and 1250.

(b) All FOOD and potable water taken on board a ship or aircraft at any seaport or airport intended for human consumption thereon shall be obtained from sources approved in accordance with regulations cited in paragraph (a) of this section.

(c) Aircraft inbound or outbound on an international voyage shall not discharge over the United States any excrement, or waste water or other polluting materials. Arriving aircraft shall discharge such matter only at servicing areas approved under regulations cited in paragraph (a) of this section.

Sec. 71.48 Carriers in intercoastal and interstate traffic.

Carriers, on an international voyage, which are in traffic between U.S. ports, shall be subject to inspection as described in Secs. 71.31 and 71.41 when there occurs on board, among passengers or crew, any death, or any ill person, or when illness is suspected to be caused by insanitary conditions.

13.2 Acute Gastroenteritis Surveillance System

13.2.1 Introduction

The following three forms are provided as guides to standardize the collection of information required to assess the patterns of AGE and monitor for OUTBREAKS aboard vessels:

- Vessel Sanitation Program - ACUTE GASTROENTERITIS (AGE) Surveillance Log
- AGE Surveillance System Questionnaire
- Meals and Activities Aboard Vessel Prior to Illness

13.2.2 Forms



Acute Gastroenteritis Surveillance System Questionnaire



(To be completed if you experienced acute gastroenteritis)

Vessel Name:		Voyage No. :		Date:	
Last Name:		First Name:			
Date of Birth:	(mm/dd/yyyy)	Age:	(in years)	Sex M / F	
Cabin Number:		Total Number of People in Cabin:			
Dining Seating:		Dining Table Number:			
Symptoms Started Date:	(mm/dd/yyyy)	Time:	(hh:mm)	AM / PM	
Do you know other people ill with the same symptoms?					Yes / No
If yes, please list their names:					
Did you stay overnight or longer in a boarding city before you joined the vessel?					Yes / No
If yes, where?		City:	State:	Country:	
Was the overnight stay in a hotel/motel/commercial residence?					Yes / No
If yes, what was the name and address of the hotel, motel/commercial residence					
Name:					
Address:					
City:		State:		Country:	
How did you travel to the city where you boarded the ship for this cruise? Select all that apply.					
<input type="checkbox"/>	Airplane	Airlines:		Flight No.:	
<input type="checkbox"/>	Automobile				
<input type="checkbox"/>	Bus/Motorcoach				
<input type="checkbox"/>	Train				
<input type="checkbox"/>	Other Please specify:				
Are you a member of a tour group?					Yes / No
Prior to boarding the ship, did you participate in a pre-embarkation tour/package?					Yes / No
If yes, which tour(s)/package(s) did you participate in? (list all)					
Prior you your illness, did you go ashore at any of the ports of call?					Yes / No
If yes, please list the ports of call where you went ashore					
Did participate in any shore excursions at any port of call?					Yes / No
If yes, which shore excursions did you participate in? (list all)					
Did you eat anything while you were ashore at any port of call?					Yes / No
Did you drink anything (including drinks with ice) while ashore at any port of call?					Yes / No
What did you think is the cause of your illness?:					

PLEASE TURN THIS FORM OVER TO PROVIDE FOOD AND SHIPBOARD ACTIVITIES HISTORY



Last Name _____ First Name _____

Meals and Activities Aboard Vessel Prior to Illness

Please list the *specific* vessel locations of the meals you consumed and the vessel activities you participated in before you became ill

Day of illness onset Give Date:	Day before illness onset	Two days before illness onset	Three days before illness onset				
Breakfast	Breakfast	Breakfast	Breakfast				
Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk				
_____	_____	_____	_____				
_____	_____	_____	_____				
_____	_____	_____	_____				
Lunch	Lunch	Lunch	Lunch				
Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk				
_____	_____	_____	_____				
_____	_____	_____	_____				
_____	_____	_____	_____				
Dinner	Dinner	Dinner	Dinner				
Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk				
_____	_____	_____	_____				
_____	_____	_____	_____				
_____	_____	_____	_____				
Snack	Snack	Snack	Snack				
Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk	Place: _____ Time: _____ Items eaten/drunk				
_____	_____	_____	_____				
_____	_____	_____	_____				
_____	_____	_____	_____				
Activities		Activities		Activities		Activities	
AM	PM	AM	PM	AM	PM	AM	PM
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

13.3 Acute Gastroenteritis Surveillance System Reporting

13.3.1 Introduction

13.3.1.1 Operations Manual

Details of the AGE surveillance data collection and notification system are contained in section 4.0 of this manual (ACUTE GASTROENTERITIS Surveillance).

Following are some sample itineraries of vessels that may call upon a U.S. port. The ports where the routine AGE surveillance report is required at least 24 hours before arrival, but not more than 36 hours, are marked with ←.

13.3.1.2 Sample Itineraries

Itinerary A

Port Everglades, FL
 at Sea
 at Sea
 St. Thomas, U.S. VI
 Philipsburg, St. Maarten
 at Sea
 Nassau, Bahamas **Port Everglades, FL ←**

Itinerary C* Barcelona, Spain
 at Sea
 at Sea
 at Sea
St. Thomas, U.S. VI ←
 at Sea
 Port Everglades, FL

Itinerary B

Vancouver, BC
 at Sea
Juneau, AK ← Ketchikan, AK
 Sitka, AK
 at Sea
 Seward, AK
 Vancouver, BC

Itinerary D

Miami, FL
 at Sea
 St. Barthélemy, French W.I.
San Juan, PR ←
 St. Thomas, U.S. VI
 at Sea
 Freeport, Bahamas
Miami, FL ←

*Note: The report in Itinerary C includes passengers and crew members during the 15 days before arrival in St. Thomas, U.S. VI.

13.3.2 Submission Procedures

13.3.2.1 Mechanism

Routine AGE surveillance reports may be submitted as follows:

- Telephone: 800-323-2132 or 954-356-6650,
- Fax: 954-356-6671,
- Email: vsp-report@cdc.gov, or
- Website (user ID and password required):
<https://wwwn.cdc.gov/midrs/gilogin.aspx>

13.3.2.2 Telephone Call Required

A telephone notification to VSP at the telephone numbers listed above must accompany a special 2% report required when the vessel is within 15 days of expected arrival at a U.S. port, even when the special 2% report is submitted via fax, electronic mail, or website.

13.4 Acute Gastroenteritis Outbreak Investigation

13.4.1 Introduction

13.4.1.1 Introduction

OUTBREAKS of AGE aboard cruise ships are relatively infrequent occurrences. Since implementation of the cooperative program between the cruise industry and VSP, the OUTBREAK rate on vessels has steadily declined each year.

13.4.1.2 Vigilance

Ongoing vigilance and rapid OUTBREAK detection and response are still warranted. Because so many people share the same environment, meals, and water, disease can often spread quickly to passengers and crew members on the vessel and overwhelm the vessel's medical system. The infection can also continue unabated between cruises if proper interventions are not instituted.

13.4.1.3 Consultation

An OUTBREAK of AGE occurs aboard a vessel when the number of cases is in excess of expected levels for a given time period. When the cumulative proportion of REPORTABLE CASES of AGE reaches 2% among passengers or 2% among crew and the vessel is within 15 days of arrival at a U.S. port, the vessel must submit a special report to VSP. This provides an early opportunity for consultation to potentially avert more illness among passengers and crew members.

13.4.1.4 Monitoring

In most instances, a 2% proportion of illness will not lead to an investigation aboard the vessel but will provide the opportunity to discuss and monitor illness patterns and collaboratively develop intervention strategies. VSP staff members are always available to discuss disease TRANSMISSION and intervention questions.

13.4.1.5 Investigation

OUTBREAKS of AGE aboard cruise ships are relatively infrequent occurrences. If the proportion of illness in either passenger or crew populations crests VSP's 3% OUTBREAK threshold or for subsequent voyages that crest the 2% or 3% thresholds, an onboard investigation may occur.

13.4.1.6 Special Circumstances

Under special circumstances, when an unusual AGE pattern or disease characteristic is found, an investigation may be conducted when the proportion of cases is less than 3%. These special circumstances may

include a high incidence of illness in successive cruises, unusual severity of illnesses or complications, or a large number of persons reporting the illness over a brief period of time.

13.4.1.7 Rapid Response

Conducting an OUTBREAK investigation aboard a vessel demands a rapid, organized, and comprehensive response. Because of the TURNOVER of passengers, and sometimes crew members, the investigation must be rapid in order to collect data needed to identify the cause.

13.4.1.8 Collaboration

The investigation is a collaborative effort of the cruise line, passengers and crew members aboard the vessel, and VSP. Therefore, an organized plan drafted between the organizations and individuals involved is crucial in conducting a successful investigation—a comprehensive effort that includes epidemiologic, environmental, and laboratory studies. Recommendations based on the success of the investigation can then be implemented to prevent a recurrence on the following cruise.

13.4.2 Objectives

The objectives of an investigation are to

- Determine the extent of the AGE among passengers and crew.
- Identify the agent causing the illness.
- Identify risk factors associated with the illness.
- Formulate control measures to prevent the spread of the illness.

13.4.3 Outbreak Investigation Procedures

13.4.3.1 Contingency Plan

The early stages of an investigation are usually coordinated aboard the vessel by the vessel's medical staff in cooperation with engineering and hotel staff. It is important to have a coordinated contingency plan in place on board the vessel before implementation is needed. All staff with a potential for involvement in an investigation should be familiar with the contingency plan.

13.4.3.2 Periodic Review

This preliminary preparation will assist the vessel with the necessary rapid implementation of investigation and response measures before the arrival of the VSP team. The OUTBREAK contingency plan should be periodically reviewed to ensure it will still meet the vessel's needs in dealing with an OUTBREAK.

13.4.3.3 Specimens and Samples

Timely collection of medical specimens and FOOD and water samples is important in the disease investigative process. The proper materials and techniques for collection and preservation are a part of the planning. It is important to periodically review these to make sure they are on hand and ready to use in the event they are needed.

13.4.3.4 Ready to Use

A list of recommended medical specimen and FOOD sample collection supplies for investigating AGE OUTBREAKS can be found in sections 13.4.5 and 13.4.6 of this annex.

Vessels with no medical staff aboard may choose to stock only the starred items in 13.4.5.1 unless a qualified staff member aboard is capable of performing venipuncture for collection of serum specimens.

13.4.3.5 Useful Information

To assist in the rapid evaluation of the extent of illness among passengers and crew and identify the causative pathogen and associated risk factors, VSP may request the following items:

- AGE OUTBREAK Action Plan for turnaround day.
- General OUTBREAK Prevention and Response Plan.
- AGE surveillance logs (previous and current voyages).
- AGE 72-hour questionnaires.
- Vessel's itinerary (previous and current voyages).
- List of shore excursions, including lunch and BEVERAGE menus.
- Public vomiting/diarrhea logs (previous and current voyages).
- POTABLE WATER bunkering, production, and distribution logs.
- POTABLE WATER bacteriological testing records.
- POTABLE WATER maintenance records.
- Recreational water logs, including information about fecal and vomit accidents.
- Vessel map of cabins with AGE CASES.
- Dining room seating maps with AGE passenger cases indicated.
- Dining room seating maps with AGE waiter and assistant waiter stations indicated.
- All menus.
- Cooling logs for POTENTIALLY HAZARDOUS FOOD.
- Vessel daily newsletters indicating guest activities.
- Letter for passengers embarking on turnaround day.
- Manifests for all groups of ≥ 15 people (groups traveling together).
- Manifests for shore excursions within 48 hours of first peak of cases.
- Security gangway records for AGE CASES within 48 hours of illness onset.

13.4.3.6 Survey

VSP may also request distribution of a survey to all passengers and crew members. VSP will provide this survey to the vessel. Completed surveys should be held in the infirmary until collection by VSP staff for epidemiologic analysis.

13.4.3.7 Interviews

Interviews with cases may also be useful for identifying the etiology and associated risk factors of an OUTBREAK. When distributing the surveys, medical staff should advise cases that interviews may be requested when VSP arrives at the vessel.

13.4.4 Report

13.4.4.1 Preliminary Report

After an OUTBREAK investigation, a preliminary report of findings based on available clinical and epidemiologic information, environmental inspection reports of the investigation, and interim recommendations will be presented to the master of the vessel. Based on preliminary findings, additional materials (including additional passenger and crew information) may be requested from the cruise line or the vessel and follow-up studies may be undertaken to address specific suspicions or concerns.

13.4.4.2 Final Report

The report presented to the master of the vessel will remain preliminary until completion of more-extensive epidemiologic and laboratory studies and distribution of a final report containing summary recommendations.

13.4.5 AGE Specimens

13.4.5.1 AGE Specimen Supplies

Supplies recommended for specimen collection include the following:

- *20–50 wide-mouth plastic jars or specimen cups with screw caps for stool specimens.
- *20 plastic bags for storing specimen cups.
- *Disposable medical gloves.
- *Plastic disposable spoons for collecting stool.
- *20 sterile bottles or tubes containing bacterial preservative and transport medium (e.g., Cary-Blair).
- *Sterile swabs.
- *Rectal swabs.
- Stool preservative medium for parasites.
- *A large commercial roll of plastic wrap.
- Sterile phlebotomy supplies for obtaining serum specimens (needles, syringes, swabs).

- Sterile pipettes.
- 20 serum separator tubes (containing no anticoagulant [red tops]).
- 20 nunc tubes for serum separation.
- Shipping containers (for diagnostic specimens).
- Shipping container labels and markings (as required by current shipping regulations for diagnostic specimens).

As noted in Annex 13.4.3.4, vessels with no medical staff aboard may choose to stock only the *starred items unless a qualified staff member aboard is capable of performing venipuncture for collection of serum specimens.

13.4.5.2 Specimen Collection

13.4.5.2.1 Request Procedures

It may be advisable to collect clinical specimens of stool, vomitus, or serum from passengers and crew members with REPORTABLE CASES of AGE. Timely notification of the vessel as to what samples and information will be required is essential. Collection of specimens for analysis for viruses, bacteria, or parasites may be recommended depending on the likely etiology of illness.

It is recommended that specimens be requested from patients during clinical evaluation in the infirmary or after infirmary visits by direct contact with or a letter from medical staff. Each individual asked to provide specimens should be given disposable gloves, two specimen cups, a disposable spoon, and plastic wrap.

Following are

- Suggested language for a passenger letter requesting stool specimens.
- Instructions to passengers and crew for collection of stool.

Request to Passengers for Stool Specimens

The [U.S. Public Health Service/Name of Cruise Line/Medical Department] is requesting stool specimens from some people who became ill with AGE on this cruise. Please give one cup to a friend who has recently become ill and use the other cup for yourself. Put your next bowel movement into the cup and return the cup to the vessel's medical center as soon possible so it can be refrigerated.

Patient Instructions

1. Urinate into the toilet (if you feel the need).
2. Wash and dry your hands.
3. Lift the toilet seat.

4. Place sheets of plastic wrap over the toilet bowl, leaving a slight dip in the center.
5. Put the toilet seat down.
6. Pass some stool onto the plastic wrap. Do not let urine or water touch the stool specimen, if possible.
7. Using the spoon given to you, place bloody, slimy, or whitish areas of the stool into the container first. Fill the cup at least 2/3 full, if possible.
8. Tighten the cap.
9. Wash your hands.
10. Label the specimen jar with your name, the date, and your cabin number.

13.4.5.2.2 Medical Staff Instructions

Specimen Labeling

Please ensure that each specimen is properly labeled with the following:

- Date of collection.
- Unique identifying number. (A separate log containing unique identifying number linked to case name must be kept on the ship.)
- Notation on use of antidiarrheal or antibiotic medication.

Collection, Storage, and Transport

Complete guidelines for collection and storage of specimens for viral, bacterial, and parasite analysis are listed below, although it may not be necessary to implement all procedures during each investigation. Transport of specimens will be arranged in collaboration with VSP.

13.4.5.3 Guidelines for Collecting Fecal Specimens for Viral Diagnosis

(Modified from *MMWR*, 1990; 39[RR-5];19.)

13.4.5.3.1 Stool for Viral Diagnosis

1. Collect stool specimens in the first 48 hours. Specimen collection should not await the results of epidemiologic and other investigations because delay will almost certainly preclude a viral diagnosis. If information gathered subsequently indicates that a viral etiology is unlikely, the specimens can be discarded.
2. Collect 10 diarrhea bulk specimens, if possible. Bulk specimens, enough to fill a large stool cup, are preferred. Serial specimens from persons with acute, frequent, high-volume diarrhea are particularly useful. The smaller the specimen and the more formed the stool, the lower the

diagnostic yield. Rectal swabs are of little or no value in viral detection. Specimens from at least 10 ill persons should be collected to maximize the chance that a diagnosis can be made. The diagnostic yield is low when specimens from fewer than 10 persons are submitted.

3. Store specimens at 4°C (40°F). Freezing may destroy the characteristic viral morphology that permits a diagnosis by electron microscopy.
4. Take special care to prevent cross-CONTAMINATION of specimens during collection and transport because new amplification techniques are exquisitely sensitive.

13.4.5.3.2 Paired Serum Specimens for Viral Diagnosis

1. Collect acute-period serum specimens during the first 5 days of symptoms. The convalescent-period serum specimen should be collected during the third to sixth week after illness.
2. Collect 10 pairs from ill persons (the same persons submitting stool specimens) and 10 pairs from well persons. Serum specimens from adults should be 10 mL and serum specimens from children should be 3 mL.
3. Use storage tubes containing no anticoagulant (tubes with red tops) for collection.
4. If a centrifuge is available, centrifuge the specimen for 10 minutes and remove the serum using a pipette. If no centrifuge is available, the blood specimens can sit in a refrigerator until a clot has formed; remove the serum using pipettes, as above.
5. Place the serum into an empty nunc tube, label, then refrigerate. Do not freeze.

13.4.5.3.3 Other Specimens for Viral Diagnosis

Water, FOOD, and Environmental Samples

Viruses causing AGE are not routinely detected in water or FOOD, but may be detectable on surfaces with environmental swabbing. Swabbing may be completed under the guidance of VSP staff or the CDC National Calicivirus Laboratory.

Viruses have been successfully detected in vomitus specimens. These should be collected and sent using same methodology as for

stool specimens.

13.4.5.4 Guidelines for Collecting Fecal Specimens for Bacteriologic Diagnosis

Before use, the transport media should be stored in a refrigerator or at room temperature. If the transport media is stored at room temperature, it should normally be chilled for 1 to 2 hours by refrigeration before use.

At least two rectal swabs or swabs of fresh stools should normally be collected for bacterial analysis and placed in refrigerated Cary-Blair transport media.

It is recommended that the swabs be inserted initially into the transport media to moisten, then inserted about 1 to 1-1/2 inches (approximately 25 to 38 millimeters) into the rectum, gently rotated, and removed for insertion individually into the same tube of transport media.

If possible, there should be visible fecal material on the swabs.

Both swabs should be inserted into the same tube of media and the swabs pushed completely to the bottom of the tube.

The top portion of the stick touching the fingers should be broken off and discarded.

Refrigeration during transport may be accomplished by shipping in an insulated box with frozen refrigerant packs. The specimens must never be frozen during storage or transport.

13.4.5.5 Guidelines for Collecting Fecal Specimens for Parasite Diagnosis

13.4.5.5.1 Parasite Specimens

In the event a disease of parasitic etiology is suspected, arrangements will be made for shipment of appropriate specimen containers containing 10% formalin and PVA (polyvinyl alcohol).

A summary table with instructions for collecting clinical specimens during OUTBREAKS to test for bacteria, viruses, and parasites is available at

www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/specimen-collection.html.

13.4.6 Food and Water Samples

13.4.6.1 Food and Water Sample Collection Kit

A recommended FOOD and water sampling kit includes the following:

- Sterile sampling containers (15 or more sealable plastic bags and wide-mouth screw top jars; 15 water sample bottles with sodium thiosulfate solution to provide concentration of 100 mg per mL of sample volume; foil or heavy wrapping paper).
- Sterile specimen collection devices (spoons, tongs, scoop, knife, scissors, swabs, and pipettes).
- DISINFECTION agents (sanitizing solution, 95% ethyl alcohol, and propane torch).
- Support EQUIPMENT (plastic gloves, plastic container liners for iced samples, waterproof marking pen for sample identification, roll of adhesive or masking tape, labels, waterproof cardboard tags with ties, insulated ice chests, and frozen refrigerant packs).

13.4.6.2 Food and Water Sampling Procedures

13.4.6.2.1 Sample Plan

Environmental sampling should be directed toward suspect FOOD and sources identified by the preliminary epidemiologic investigation.

13.4.6.2.2 Aseptic Techniques

FOOD and water samples should be collected using aseptic techniques. Washed and gloved hands and sterile sampling UTENSILS and containers protect the integrity of the sample during collection. Taps used for water collection should be sterilized with heat or chemicals. The sample should be collected after 1 minute of flow time.

13.4.6.2.3 Sample Amount

Approximately 200 grams or 200 mL of sample will usually suffice for the laboratory analytical requirements. Carefully squeeze most of the air out of the bag before sealing FOOD samples.

13.4.6.2.4 Sample Identification

Sample numbers should be assigned on each collection container and recorded on a sample log that will accompany samples to the laboratory. Record information that identifies the date, time, and location of collection; product information; codes; storage

conditions and temperatures for each sample on the sample log. Include contact information for the PERSON IN CHARGE of collecting the samples on the vessel.

13.4.6.2.5 Sample Temperatures

FOOD and water samples should be held below 5°C (41°F) but not frozen. Sufficient frozen refrigerant packs should be used to maintain cold sample temperatures during transport to the laboratory.

13.5 Disinfection Calculations for Water and Equipment

13.5.1 Introduction

POTABLE WATER systems and EQUIPMENT, SWIMMING POOLS, and WHIRLPOOL SPAS on a vessel may need to be disinfected when there is a possibility of CONTAMINATION and as a routine part of maintenance.

This annex provides tables for calculating the amount of chlorine to be used in emergency chlorination of POTABLE WATER and for the routine DISINFECTION of POTABLE WATER systems and EQUIPMENT, SWIMMING POOLS, and WHIRLPOOL SPAS.

13.5.2 Water Chlorination

Tables 1 and 2 (Annex 13.5.4) are for calculating the amount of chlorine to be used in the DISINFECTION of POTABLE WATER systems, SWIMMING POOLS, and EQUIPMENT.

Amounts of chlorine compound shown in Table 1 are in GRAMS.
Amounts of chlorine compound shown in Table 2 are in KILOGRAMS.

The chlorine compound column in Tables 1 and 2 refers to the amount of available chlorine in the compound as stated on the product label. Requirements varying from those shown in the table—for example: metric tons of water, available chlorine compounds, or final chlorine concentrations—may be extrapolated.

For example, POTABLE WATER TANKS or fresh water tanks must be superchlorinated to at least 50 MG/L (ppm) available chlorine when samples taken from these tanks indicate potential CONTAMINATION with fecal coliform bacteria.

The total amount of 70% chlorine compound required to obtain 50 MG/L (ppm) in 166 metric tons of water is calculated in Example 1, which illustrates how to use the tables.

Example 1. The capacity of a potable tank from which a coliform-positive sample was obtained is 166 metric tons. The vessel has a compound on board containing 70% available chlorine.

The amount of chlorine required for 50 ppm is determined as follows:

- Use the 70% chlorine compound columns in Table 1.
- Find the 70% row that corresponds to 100 metric tons of water.
- Follow this 70%/100 ton row across until you reach the “50 ppm” column (7,150 grams).
- Do the same using the 50, 10, 5, and 1 metric ton columns to

determine the totals for 166 metric tons.

- Total each column as shown in the calculation table below.

Calculation Table for Example 1

Metric Tons of Water	Grams Required, 70% Available Chlorine Solution
100	7,150.0
50	3,575.0
10	715.0
5	357.5
1	71.5
166 Total Weight of Water	11,869.0 grams or 11.87 kilograms

In this example, the amount of 70% chlorine compound required for 166 tons of water at 50 parts per million is 11,869.0 grams or 11.87 kilograms.

13.5.3 Equipment Disinfection

The Available Chlorine in Compounds table lists the various chlorine compounds and the amount of the compound required in grams per liter of water to produce a solution containing 100 ppm of chlorine. The 100-ppm chlorine solution should be applied as outlined in this manual.

Available Chlorine in Compounds

Grams per Liter of Available Chlorine	Grams per Liter for 100 ppm
70%	0.143
65%	0.154
25%	0.4
15%	0.7
10%	1.0
5%	2.0

13.5.4 Tables

Table 1. Amount of Chlorine Required in GRAMS to Produce Desired Parts per Million (ppm) (MG/L)

Chlorine Compound	Metric Tons of Water	1 ppm	2 ppm	5 ppm	10 ppm	50 ppm	100 ppm
70%	1	1.43	2.86	7.15	14.30	71.50	143.00
70%	5	7.15	14.30	35.75	71.50	357.50	715.00
70%	10	14.30	28.60	71.50	143.00	715.00	1,430.00
70%	50	71.50	143.00	357.50	715.00	3,575.00	7,150.00
70%	100	143.00	286.00	715.00	1,430.00	7,150.00	14,300.00
65%	1	1.54	3.08	7.70	15.40	77.00	154.00
65%	5	7.70	15.40	38.50	77.00	385.00	770.00
65%	10	15.40	30.80	77.00	154.00	770.00	1,540.00
65%	50	77.00	154.00	385.00	770.00	3,850.00	7,700.00
65%	100	154.00	308.00	770.00	1,540.00	7,700.00	15,400.00
25%	1	4.00	8.00	20.00	40.00	200.00	400.00
25%	5	20.00	40.00	100.00	200.00	1,000.00	2,000.00
25%	10	40.00	80.00	200.00	400.00	2,000.00	4,000.00
25%	50	200.00	400.00	1,000.00	2,000.00	10,000.00	20,000.00
25%	100	400.00	800.00	2,000.00	4,000.00	20,000.00	40,000.00

Table 2. Amount of Chlorine Required in KILOGRAMS to Produce Desired Parts per Million (ppm) (MG/L)

Chlorine Compound	Metric Tons of Water	1 ppm	2 ppm	5 ppm	10 ppm	50 ppm	100 ppm
15%	1	0.007	0.01	0.03	0.07	0.34	0.70
15%	5	0.035	0.07	0.17	0.35	1.70	3.50
15%	10	0.070	0.13	0.34	0.70	3.40	7.00
15%	50	0.350	0.65	1.70	3.50	17.00	35.00
15%	100	0.70	1.30	3.40	7.00	34.00	70.00
10%	1	0.01	0.02	0.05	0.10	0.50	1.00
10%	5	0.05	0.10	0.25	0.50	2.50	5.00
10%	10	0.10	0.20	0.50	1.00	5.00	10.00
10%	50	0.50	1.00	2.50	5.00	25.00	50.00
10%	100	1.00	2.00	5.00	10.00	50.00	100.00
5%	1	0.02	0.04	0.10	0.20	1.00	2.00
5%	5	0.10	0.20	0.50	1.00	5.00	10.00
5%	10	0.20	0.40	1.00	2.00	10.00	20.00
5%	50	1.00	2.00	5.00	10.00	50.00	100.00
5%	100	2.00	4.00	10.00	20.00	100.00	200.00

13.6 Potable Water Pipe and System Disinfection Method Examples (Nonemergency)

Examples in this section relate to nonemergency situations. In an emergency, see section 5.3.4.1.4 for concentration and contact time.

To achieve the proper DISINFECTION of a section of pipe being replaced,

- Fill the pipe with 50 MG/L (ppm) of free residual HALOGEN, cap on both ends, and let it sit for 4 hours **OR** Place small sections of pipes in a large container filled with 50 MG/L (ppm) of free residual HALOGEN for 4 hours.
- Drain and flush disinfected parts of the system with POTABLE WATER.

To achieve the proper DISINFECTION of a section of pipe already installed on part of the distribution system,

1. Install temporary shut-off valves at each end of the new section.
2. Close the valves.
3. Inject 50 MG/L (ppm) of free residual HALOGEN through a temporary injection port.
4. Let it stand for 4 hours.
5. Drain and flush disinfected parts of the system with POTABLE WATER.

13.7 Sample Cross-Connection Control Program Guideline

13.7.1 Background

Unprotected CROSS-CONNECTIONS to the POTABLE WATER system can result in mild changes to the aesthetic quality of the water affecting taste, odor, and color or severe changes that can result in illness or death. The purpose of a CROSS-CONNECTION control program is to identify these connections and provide appropriate protection.

13.7.2 Introduction

Use this outline to either develop a comprehensive CROSS-CONNECTION control program or update and maintain an existing program.

13.7.3 Cross-Connection Survey

One of the first steps in developing a CROSS-CONNECTION control program is to conduct a thorough survey of the POTABLE WATER system to identify all actual or potential CROSS-CONNECTIONS. Although an initial survey of the vessel can be time consuming, it is essential to ensure that all connections are identified so that appropriate protection can be decided on.

Protection of POTABLE WATER can take two forms—containment or complete protection. Although the former may be the objective for a water supplier and requires less time and detail, the latter is the objective for this guidance.

Example: A surveyor enters a structure and identifies numerous connections to the POTABLE WATER—both nonhealth-HAZARD and health-HAZARD connections. For containment purposes, an RP ASSEMBLY on the exterior supply line downstream of the water meter would contain all of the HAZARDS within the structure but would do nothing to protect the individual connections within the facility. If complete protection is the goal, each CROSS-CONNECTION in the structure must be identified and a decision made as to the appropriate BACKFLOW PREVENTION METHOD to be used. For vessels under VSP, the goal is complete protection.

Surveyors should be

- Knowledgeable in basic plumbing.
- Knowledgeable in the principles of BACKFLOW, including BACKSIPHONAGE and BACKPRESSURE.
- Able to identify both potential and actual CROSS-CONNECTIONS.
- Familiar with the level of HAZARD posed by each connection.

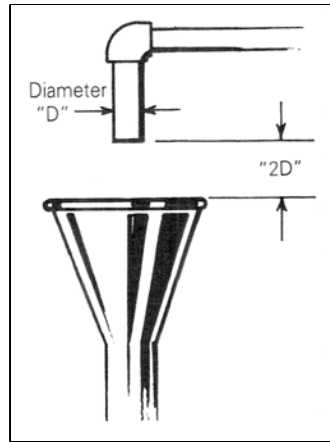
Surveyors should physically inspect all areas of the vessel supplied with POTABLE WATER. The best approach for this may be to go deck by deck, starting with the decks with connections that pose the greatest risk to health.

This may require starting with the engine room deck. As each connection is identified, it is added to a listing. All information related to this connection should also be added to the listing. An example of required information can be found in section 13.7.5.1. Unprotected or inadequately protected connections must be addressed as quickly as possible, especially if the connection is a health HAZARD.

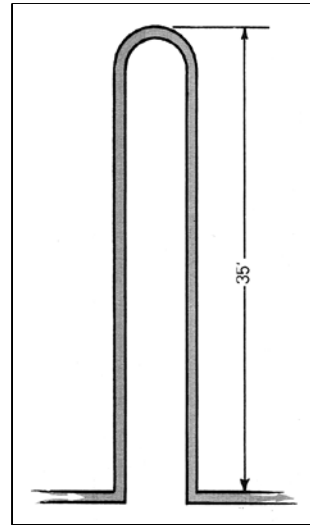
13.7.4 Backflow Protection Methods

All figures in this section are provided courtesy of the U.S. Environmental Protection Agency (EPA).

13.7.4.1 Nonmechanical Backflow Protection

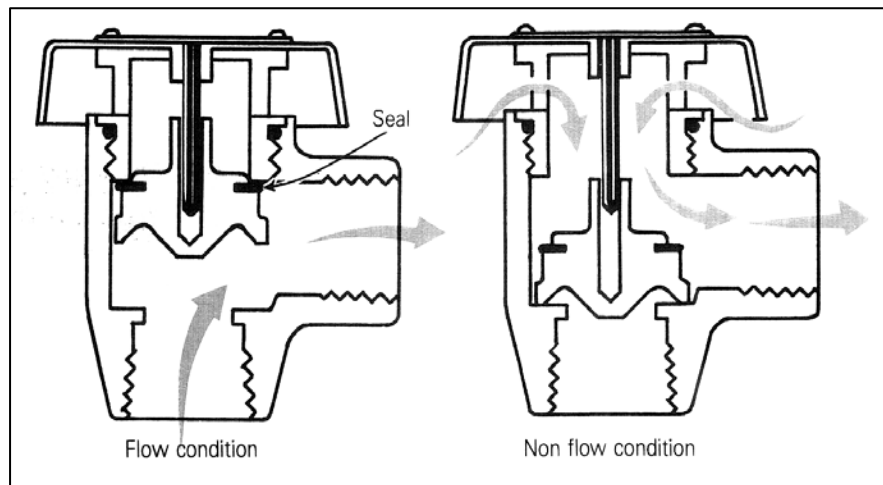


AIR GAP

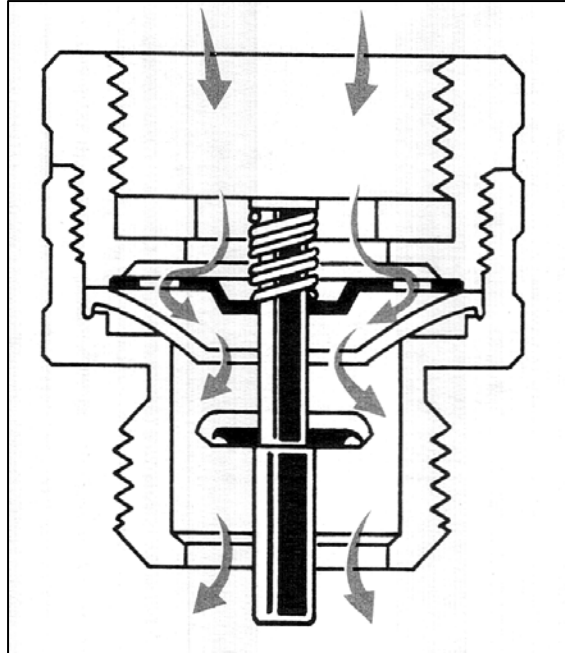


Antisiphon loop

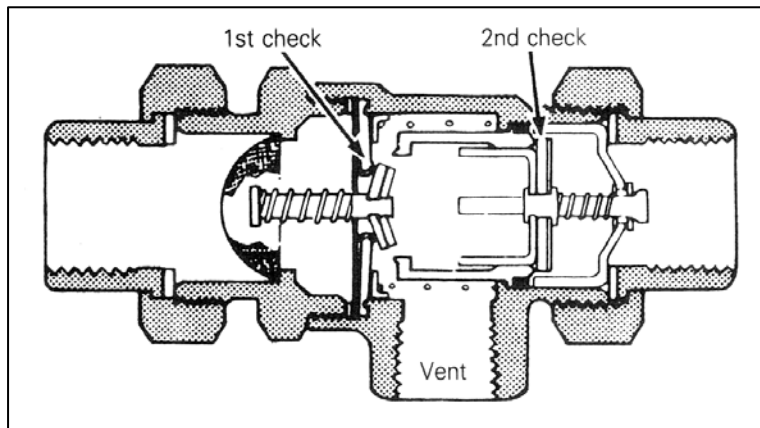
13.7.4.2 Mechanical Backflow Protection



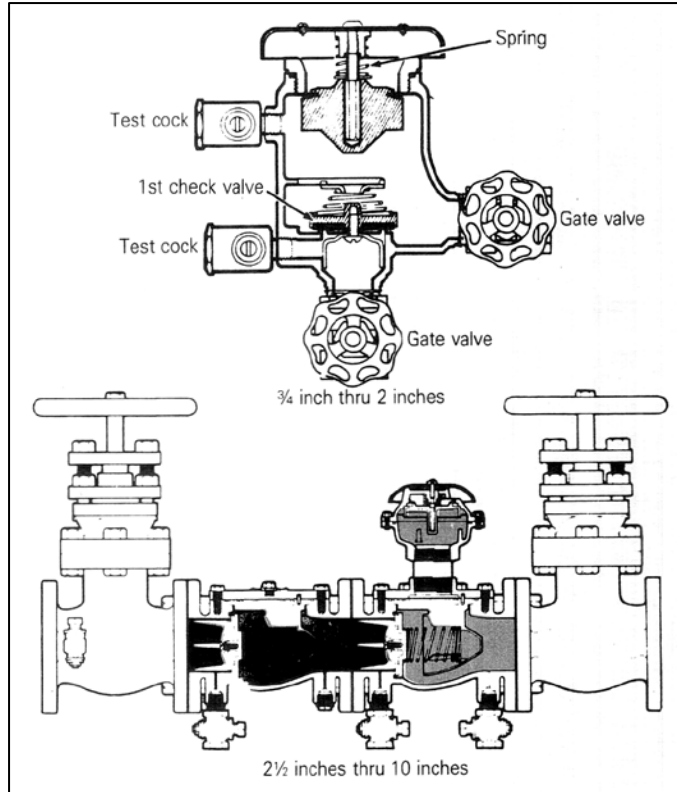
ATMOSPHERIC VACUUM BREAKER



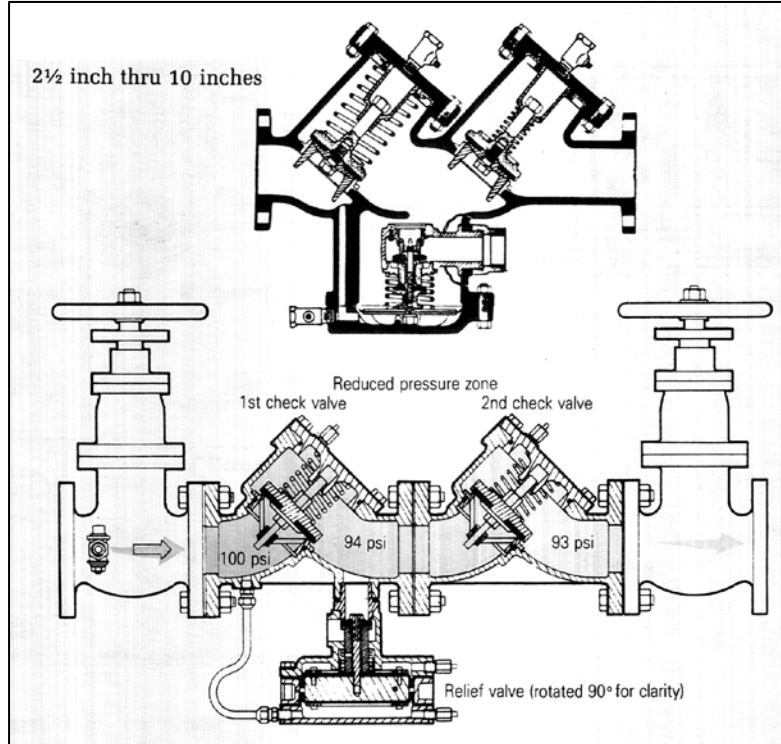
HOSE-BIB VACUUM BREAKER



DUAL CHECK VALVE WITH ATMOSPHERIC VENT



PRESSURE VACUUM BREAKER



REDUCED PRESSURE PRINCIPLE ASSEMBLY

13.7.5 Cross-Connections on Vessels

13.7.5.1 List of Connections Requiring Backflow Prevention on Vessels

A log listing of all CROSS-CONNECTIONS on the vessel must be developed. At a minimum the log should contain the data elements in numbers 2, 3, 6, 7, and 8. Inclusion of the additional data in numbers 1, 4, and 5 is recommended.

1. Deck (A, B, C, 1, 2, 3...).
2. Location (of connection and of device, if different).
3. Connection description (e.g., hose, chemical tank, coffee machine, detergent dispenser).
4. Connection subjected to CONTINUOUS PRESSURE (CP) or noncontinuous pressure (NCP).
5. Connection subjected to [*BACKSIPHONAGE only* or *BACKSIPHONAGE and BACKPRESSURE*].
6. Protection used (AIR GAP or manufacturer name and designation for device).
7. Inspection date.
8. Inspection results (passed, replaced, psi results).

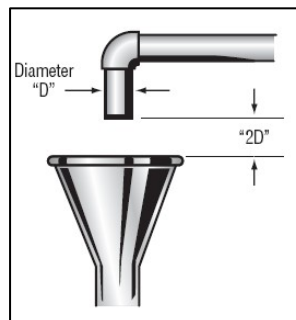
13.7.5.2 Specific Backflow Protection Choices on Vessels: Air Gaps and Backflow Prevention Devices

Use this section to provide information to vessel staff on the specific BACKFLOW PREVENTION DEVICES used on the vessel. For each device, a copy of the specification sheets or technical sheets as well as the manufacturer's installation recommendations should be included in the program documentation file. Generally these documents are available online from the websites of each device manufacturer.

AIR GAPS

Vessel-designed AIR GAPS

- See definitions



Manufactured AIR GAPS

- Manufacturer's specification sheets
- Manufacturer's installation recommendations

Noncontinuous Pressure Devices

ATMOSPHERIC VACUUM BREAKER

- Manufacturer's specification sheets
- Manufacturer's installation recommendations

Hose Vacuum Breaker

- Manufacturer's specification sheets
- Manufacturer's installation recommendations

Select DUAL-CHECK VALVE with intermediate vents (such as Watts NLF9)

- Manufacturer's specification sheets
- Manufacturer's installation recommendations

CONTINUOUS PRESSURE devices

Select DUAL CHECK VALVE with intermediate vent (such as Watts N9)

- Manufacturer's specification sheets
- Manufacturer's installation recommendations

PRESSURE VACUUM BREAKER

- Manufacturer's specification sheets
- Manufacturer's installation recommendations
- Test kit and instructions

REDUCED PRESSURE PRINCIPLE ASSEMBLY

- Manufacturer's specification sheets
- Manufacturer's installation recommendations
- Test kit and instructions

References

- EPA CROSS-CONNECTION Control Manual
- Device manufacturer list (based on devices used on vessel)
- Manual of CROSS-CONNECTION Control, 9th edition (University of Southern California)

13.8 Baby-Only Water Facility

For use by children who are in diapers or who are not completely toilet trained.

13.8.1 Introduction

VSP recognizes the increased desire of passengers to allow children who are in diapers or who are not completely toilet trained to use RWFs. With that in mind, following are requirements for operating a RWF for the sole use by children who are in diapers or who are not completely toilet trained. Each cruise line is required to submit a VARIANCE request to operate this type of facility.

Administrative Note: This section does not apply to vessels that have an APPROVED VARIANCE from section 6.9.1 at the time of issuance of the *VSP 2018 Operations Manual*. Those vessels must continue to comply with all of the requirements of the VARIANCE.

13.8.2 Design and Construction

Facilities must be designed and constructed in accordance with the latest version of the *VSP Construction Guidelines*, regardless of the date the keel was laid.

Before new construction or remodeling of an existing RWF, all plans must be submitted for review and approval by VSP. Once APPROVED, no parts of the system or its operation may be changed without prior written approval from VSP. For maintenance purposes, system components of at least equal performance specifications may be changed without prior approval.

13.8.3 Water Source

13.8.3.1 Recirculation

The water source for this facility must only be POTABLE WATER for recirculation systems.

13.8.3.2 Flow-Through

Seawater or POTABLE WATER may be used for a flow-through system.

13.8.3.3 Operation

The system must be designed to operate in flow-through only or recirculation only.

13.8.3.3.1 Flow-Through

At Sea

A flow-through seawater supply system must be used only while the vessel is MAKING WAY and at sea beyond 20 kilometers (12 miles) from nearest land or any point of land discharge.

In Port

Before arriving to a port or HARBOR, the seawater supply system must be shut down and the facility closed for use before the vessel reaches the 20-kilometer (12-mile) mark or any point of land-based discharge. The system must remain empty while in port or at anchor or the flow-through supply must be switched to POTABLE WATER.

Recirculation

Fill water must be provided only to the compensation tank and not directly to the BABY-ONLY WATER FACILITY.

TURNOVER Rate

The entire volume of water must pass through all parts of the system to include filtration, secondary UV DISINFECTION, and halogenation at least once per half hour.

The filtration, UV DISINFECTION, and HALOGEN and pH control systems must be operated 24 hours a day. This is required even when the facilities are not in use. The systems may only be shut down for required maintenance or cleaning of system components.

13.8.3.4 Filtration

BABY-ONLY WATER FACILITY water must be filtered.

At least one replacement cartridge or canister-type filter must be available.

Cartridge or canister-type filters must be inspected weekly for cracks, breaks, damaged components, and accumulation of excessive organic material.

Granular filters must be backwashed daily. Backwashing must be repeated until the water viewed through the sight glass or discharge point is clean flowing.

The granular filters must be opened monthly and examined for channeling, mounds, or holes in the filter media. **Inspection method: Drain the water from the filter housing and inspect the granular filter for cracks, mounds, or holes.**

A core sample must be examined monthly for accumulation of excessive organic material. **Core sample method:**

1. **Take a sand sample from the filter core after inspection and place it in a clear container. A core sample can be taken by inserting a rigid hollow tube or pipe in to the filter media.**

2. **Add clean water to the clear container, cover, and shake.**
3. **Allow the container to rest undisturbed for 30 minutes.**
4. **Evaluate sample. If, after 30 minutes of settling, a measurable layer of sediment is within or on top of the filter media or fine, colored particles are suspended in the water, the organic loading may be excessive. Consider media replacement.**
5. **Record results of filter inspection and sedimentation test in a log.**

Cartridge filters must be replaced based on inspection results or manufacturer's recommendations, whichever is sooner.

The granular filter media must be replaced at least every 6 months. Before the new filter media is placed in the filter housing, the housing must be scrubbed with an appropriate cleanser, rinsed, and disinfected. DISINFECTION must be accomplished with an appropriate HALOGEN-based DISINFECTANT at 1 ppm for 50 minutes, or an equivalent CT VALUE. Record the filter replacement date and cleaning and DISINFECTION of the filter housing in a log. The log must include the DISINFECTANT residual and contact time or CT VALUE.

Filter pressure gauges and valves must be replaced when they are defective.

The operating manuals for all components such as filters, pumps, HALOGEN and pH control EQUIPMENT, and UV DISINFECTION systems must be maintained aboard the vessel in a location ACCESSIBLE to crew members who are responsible for the operation and maintenance of these facilities.

13.8.3.5 Halogen and pH Control

Automated HALOGEN dosing and pH control systems must be installed and maintained.

Halogenation must be by use of chlorine or bromine. A free residual of HALOGEN must be maintained between 3.0-10.0 ppm for chlorine and 4.0-10.0 ppm for bromine.

The pH levels must be maintained between 7.2 and 7.6.

13.8.3.6 UV Disinfection

A UV DISINFECTION system must be installed after filtration and before HALOGEN-based DISINFECTION.

The UV DISINFECTION system must be maintained at an intensity that inactivates *Cryptosporidium parvum* and *Giardia*.

The UV DISINFECTION system must be maintained and operated in accordance with the manufacturer's recommendation. At least one spare UV lamp must be available.

13.8.3.7 System Shutdown

An automatic shutdown must be maintained whereby any failure in maintaining the required free residual HALOGEN level, pH level, or UV lamp intensity must cause the water to completely divert from the BABY-ONLY WATER FACILITY and instead loop back to the compensation tank. Additionally, this system must be equipped with an audible alarm that sounds in a continuously manned space, such as the bridge or engine control room.

13.8.3.8 Shutdown and Alarm Testing

The emergency shutdown and alarms systems must be tested monthly. Testing procedures and results must be recorded.

13.8.4 System Cleaning and Disinfection

13.8.4.1 Daily Cleaning of Spray Pad Surface

Every 24 hours, the SPRAY PAD surface and any associated features must be cleaned with an appropriate cleaner. The surface must be rinsed and disinfected at 50-ppm free residual HALOGEN for 1 minute, or the equivalent CT VALUE. Ensure that the liquid waste from this process is not directed to the compensation tank.

At least every 72 hours, the facility must be shut down and these procedures must be followed:

1. The entire volume of water within the system must be discharged. This includes the BABY-ONLY WATER FACILITY, compensation tank, filter housing, and all associated piping.
2. The BABY-ONLY WATER FACILITY, compensation tank, and filter housing (cartridge filter) must be cleaned with an appropriate cleanser, rinsed, and disinfected (chlorine or bromine). DISINFECTION must be accomplished with a solution of at least 50 MG/L (ppm) free residual HALOGEN for 1 minute, or the equivalent CT VALUE.

13.8.5 Monitoring and Record Keeping

An automated analyzer-chart recorder capable of recording free residual HALOGEN levels in MG/L (ppm) and pH levels must be installed.

The system must be checked for calibration before opening the facility for use, and then every 3 hours thereafter with a test kit accurate to within 0.2 MG/L

(ppm) free residual HALOGEN and 0.2 pH.

- Charts must be reviewed and signed daily by trained supervisory staff.
- Charts must be dated and changed daily.
- Records must be retained for 12 months.

In the event of a failure in the automated analyzer-chart recorder, manual tests must be conducted and recorded for each required parameter on an hourly basis. A maximum of 72 hours will be allowed for manual tests while repairs are under way. If more than 72 hours pass, the facilities must be shut down until repairs are completed.

A log must be kept to detail all maintenance activities, including the following:

- Filter changes including filter housing cleaning and DISINFECTION (including ppm and contact time).
- Backwashing time.
- Fecal accidents.
- Injury accidents.
- Facility opening and closing times.

One test must be conducted at the end of each day for the presence of *Escherichia coli* (*E. coli*) using a test in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*. Test kits, incubators, and associated EQUIPMENT must be operated and maintained in accordance with the manufacturers' specifications.

For positive *E. coli* tests, follow this procedure:

- Discharge the entire volume of water within the system. This includes the BABY-ONLY WATER FACILITY, compensation tank, filter housing, and all associated piping.
- Use an appropriate cleaner on the BABY-ONLY WATER FACILITY, compensation tank, and filter housing (cartridge filter), then rinse and disinfect them (chlorine or bromine). DISINFECTION must be accomplished with a solution of at least 50 MG/L (ppm) for 1 minute, or the equivalent CT VALUE.
- Conduct follow-up testing. The facility must not be put back in operation unless follow-up test results are negative for the presence of *E. coli*.

A record of the test results must be maintained onboard the vessel and must be available for review during inspections. Retain records for 12 months.

The maintenance logs, records, and charts must be kept for 12 months.

13.8.6 Training

At least one person trained in the maintenance and operation of RWFs must be on the vessel and available at all times the facility is open for use. Such training includes the requirements of this manual, prevention of recreational water

illnesses and injuries, HALOGEN and pH control chemicals, UV DISINFECTION systems, recreational water safety, and using test kits for HALOGEN-based DISINFECTANTS and pH. A record must be kept with the names of all trained individuals.

13.8.9 Monitor

At least one individual must be available in the immediate area of the facility when it is open for use. This individual must monitor the area to ensure all of the following:

- Children are wearing swim diapers.
- Diapers are changed at suitable diaper-changing stations and not at the facility.
- All children are under adult supervision.
- FOOD, BEVERAGES, and glass are not used near the facility.
- There is no running or boisterous play near the facility.
- Children who are ill are prohibited from using the facility.

13.8.8 Safety

13.8.8.1 Eye Damage

Ensure that water sprays are designed with pressures and directional flow controls to prevent eye damage to users.

13.8.8.2 Safety Sign

A safety sign must be posted by the facility with letters at least 26 millimeters (1 inch) high at each entrance to the BABY-ONLY WATER FACILITY feature that states, at a minimum, the following:

- This facility is only for use by children in diapers or who are not completely toilet trained.
- Children who have a medical condition which may put them at increased risk for illness should not use these facilities.
- Children who are experiencing symptoms such as vomiting, fever, or diarrhea are prohibited from using these facilities.
- Children must be accompanied by an adult at all times.
- Children must wear a clean swim diaper before using these facilities. Frequent swim diaper changes are recommended.
- Do not change diapers in the area of the BABY-ONLY WATER FACILITY. A diaper changing station has been provided (exact location) for your convenience.

The letters on the sign heading must be at least 26 millimeters (1 inch) high, but all other lettering must be at least 13 millimeters (1/2 inch) high.

Pictograms may replace words as appropriate or available.

This information may be included on multiple signs, as long as they are posted at the entrances to the facility.

13.8.9 Swim Diapers

Swim diapers in a variety of sizes must be available in close proximity to this facility.

13.9 Fecal, Vomit, and Blood Accident Response for RWFs

13.9.1 Fecal and Vomit Accident Response for RWFs

This annex includes a sample fecal accident plan and sample fecal accident log required data elements. The sample fecal accident plan is based in part on recommendations found on CDC's Healthy Swimming website (www.cdc.gov/healthywater/swimming).

In the sample plan (13.9.1.1), two tables address chlorine residuals and contact times to be used for DISINFECTION after an accident involving fecal material or vomitus. Each table has chlorine residuals and contact times that reduce the risk for recreational water illness based on the pathogenic organisms that might be present as a result of a fecal or vomit accident.

- The Residual and Contact Time for Loose Stool table shows chlorine residuals and contact times to address loose stools. The primary pathogenic organism of concern in loose stool is *Cryptosporidium*. This organism is highly chlorine resistant; to destroy it, a CT VALUE of 15,300 is required. This means that when the chlorine residual in ppm is multiplied by the contact time in minutes, a minimum of 15,300 is required.
 - Concentration (ppm) X Contact Time (minutes) \geq 15,300
- The Residual and Contact Time for Formed Stool or Vomitus table shows chlorine residuals and contact times to address accidents involving formed stools or vomitus. The disease-causing organisms of primary concern are *Giardia*, *E. coli* 0157:H7, and *Shigella*. To destroy the more highly chlorine resistant of these organisms (*Giardia*), a CT VALUE of 45 is required. This means that when the chlorine residual in ppm is multiplied by the contact time in minutes, a minimum of 45 is required.
 - Concentration (ppm) X Contact Time (minutes) \geq 45

To determine the appropriate chlorine residual and contact time, operators should observe the nature of the accident.

- If the fecal accident is loose (diarrhea), the loose-stool table should be used for DISINFECTION.
- If the fecal material is solid or formed or if the accident involves vomitus, the formed stool or vomitus table should be used for DISINFECTION.

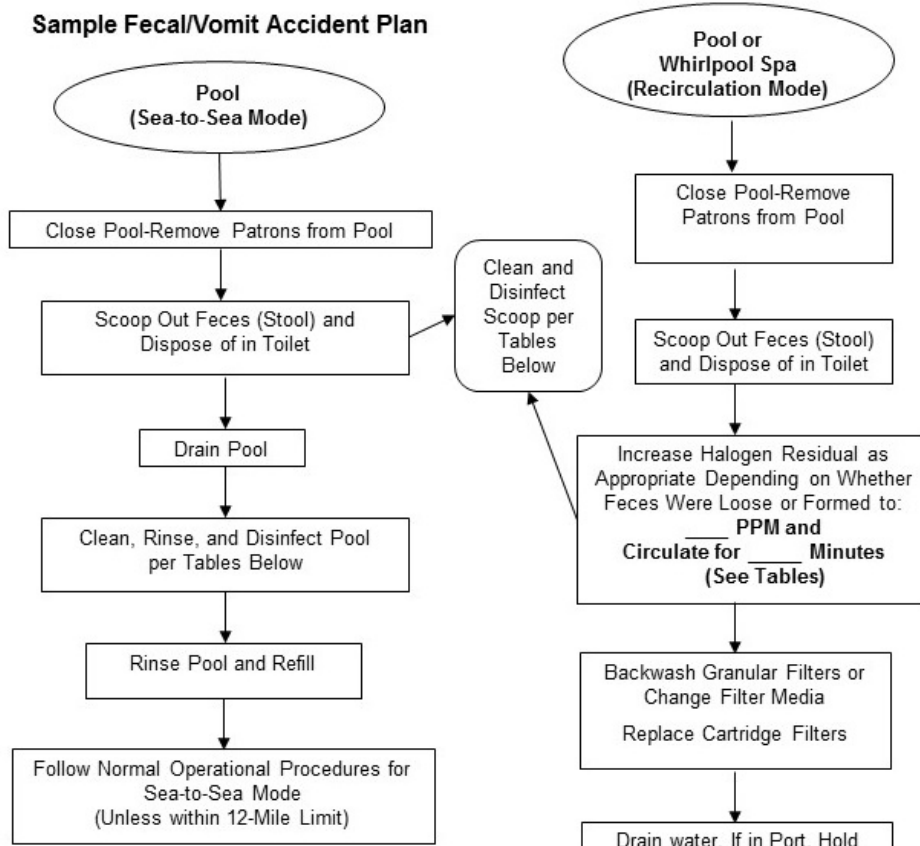
It is important to remember that the DISINFECTION capabilities of chlorine diminish as pH increases. Operators should ensure that pH levels are maintained **7.5 or less at 77°F (25°C) or higher** during this DISINFECTION process.

Record all fecal/vomit accidents in a log with all of the following information:

- Name of RWF.
- Date of event.
- Time of event.
- Number of bathers.
- Formed stool, loose stool, or vomitus.
- Chlorine residual for DISINFECTION.
- Contact time for DISINFECTION.
- pH level for DISINFECTION.
- Chlorine residual for reopening.
- pH for reopening.

13.9.1.1 Fecal/Vomit Accident Plan

Sample Fecal/Vomit Accident Plan



Residual and Contact Time for Loose Stool	
Chlorine Residual MG/L or PPM	Contact Time Minutes (Hours)
10	1530 (25.5)
20	765 (12.75)
50	306 (5.1)
100	153 (2.55)

Chlorine Residual and Contact Time for Formed Stool or Vomitus	
Chlorine Residual, MG/L (ppm)	Contact Time, Minutes (Hours)
2	25 (0.42)

NOTE: Maintain pH of 7.5 or less at 77°F (25°C) or higher. Take samples from inside pool/spa at three locations to ensure proper mixing.

Record fecal accidents in a log.

13.9.2 Blood Response Q and A

Excerpt from www.cdc.gov/healthywater/swimming/pools/vomit-blood-contamination.html.

13.9.2.1 Blood in Pool Water

Germ (for example, Hepatitis B virus or HIV) found in blood are spread when infected blood or certain body fluids get into the body and bloodstream (for example, by sharing needles and by sexual contact). Chlorine kills germs found in blood and CDC is not aware of any instances in which a person has become infected with these germs after being exposed to a blood spill in a pool.

Q: Does chlorine kill the germs in blood?

A: Yes. These germs do not survive long when diluted into properly chlorinated pool water.

Q: Swimmers want something to be done after a blood spill. Should the pool be closed for a short period of time?

A: There is no public health reason to recommend closing the pool after a blood spill. However, some pool staff choose to do so temporarily to satisfy patrons.

13.10 Cartridge Filter Cleaning Procedures

Cartridges should be cleaned in accordance with manufacturer's instructions where available and complete. In the absence of instructions, clean filters when the gauge pressure differential is 10 psi (68.9 KPa).

Cleaning EQUIPMENT should include a soaking container properly sized to immerse the filter elements, a rinsing area with proper drainage, and a drying area protected from CONTAMINATION (e.g., birds and insects).

New filters do not regain 100% of their capacity. Perhaps only about 80% of the capacity is recoverable, regardless of the treatment. If the recommended design flow rate exceeds 80% of the maximum flow allowed on the filter, the filter may be undersized.

Facilities with cartridge filters are recommended to have EQUIPMENT on-site to clean the cartridges. This includes a basin or tub large enough to immerse the entire cartridge. Water from the cleaning and soaking process must be discharged to the sanitary sewer. Proper cleaning is critical. Failure to clean the cartridge properly can lead to disease OUTBREAKS.

How to Clean Cartridge Filters:

1. Rinse Thoroughly: Rinse the cartridge of as much dirt and debris as possible by washing inside and out with a garden hose and spray nozzle.

DO NOT use a pressure washer. High flow/pressure can drive dirt into the interior and permanently damage the cartridge. It can also aerosolize pathogens in the filter.

2. Degrease: Cartridge filters need to be degreased each time they are cleaned. Body oil, suntan oil, cosmetics, hair products, and/or algae and biofilms can form a greasy coating on the filter pleats, which will clog the pores and reduce the filter capacity.

Soak the cartridge overnight in one of the following:

- Filter cleaner/degreaser OR
- A solution of water with 1 cup (236.6 g) of TSP (trisodium phosphate) OR
- One cup (236.6 g) of automatic dishwashing detergent per 5 gallons (3.8 L) of water.

Never use muriatic acid or products with acid in them before degreasing. Acid may permanently set the grease and ruin the cartridge.

Rinse thoroughly.

3. Sanitize: To remove or prevent biofilms, algae, and bacteria growing on the cartridge, add 1 quart (0.95 L) of household bleach per 5 gallons (19 L) of clean water and soak 1 hour before rinsing.

4. Rinse: Remove the clean cartridge from the SANITIZATION soak water and rinse thoroughly with a hose.

5. Dry: After the filter is cleaned and degreased, it should be allowed to dry completely. Some bacteria (for example, *Legionella* spp.) that survive the cleaning process can be killed by drying. Do not allow the filter to become contaminated with dirt or soil after it is cleaned. Put the cartridges in a clean plastic trash bag if they are to be transported and the original boxes are not available.

Acid Wash (Only if Necessary): Excessive calcium or mineral deposits on the filter media can be cleaned with a 1:20 solution of clean water and muriatic acid. Put a few drops of muriatic acid on the filter. If it foams, it might need to be acid washed. Very few filters need to be acid washed.

13.11 Food Cooking Temperature Alternatives

13.11.1 Introduction

To be effective in eliminating pathogens, cooking must be adjusted to a number of factors. These include the anticipated level of pathogenic bacteria in the raw product, the initial temperature of the FOOD, and the FOOD's bulk, which affects the time to achieve the needed internal product temperature. Other factors to be considered include postcooking heat rise and the time the FOOD must be held at a specified internal temperature.

To kill microorganisms, FOOD must be held at a sufficient temperature for the specified time. Cooking is a scheduled process in which each of a series of continuous TIME/TEMPERATURE combinations can be equally effective. For example, in cooking a beef roast, the microbial lethality achieved at 112 minutes after it has reached 54°C (130°F) is the same lethality attained as if it were cooked for 4 minutes after it has reached 63°C (145°F).

Cooking requirements are based in part on the biology of pathogens. The thermal destruction of a microorganism is determined by its ability to survive heat. Different species of microorganisms have different susceptibilities to heat. Also, the growing stage of a species (such as the vegetative cell of bacteria, the trophozoite of protozoa, or the larval form of worms) is less resistant than the same organism's survival form (the bacterial spore, protozoan cyst, or worm egg).

FOOD characteristics also affect the lethality of cooking temperatures. Heat penetrates different FOODS at different rates. High fat content in FOOD reduces the effective lethality of heat. High humidity within the cooking vessel and the moisture content of FOOD aids thermal destruction.

Heating a large roast too quickly with a high oven temperature may char or dry the outside, creating a layer of insulation that shields the inside from efficient heat penetration. To kill all pathogens in FOOD, cooking must bring *all* parts of the FOOD up to the required temperatures for the correct length of time.

The TEMPERATURE AND TIME COMBINATION CRITERIA specified in Annex 13.11.2 are based on the destruction of *Salmonellae*. This section includes temperature and time parameters that provide "D" values (decimal log reduction values) that may surpass 7D. For example, at 63°C (145°F), a time span of 15 seconds will provide a 3D reduction of *Salmonella enteritidis* in eggs. This organism, if present in raw shell eggs, is generally found in relatively low numbers.

Other FOODS, FISH, and MEATS that have not been ground or minced—including commercially raised GAME ANIMAL MEAT specified as acceptable

for cooking at this temperature and time parameter—are expected to have a low level of internal CONTAMINATION. The parameters are expected to provide destruction of the surface contaminants on these FOODS.

13.11.2 Temperature-Time Alternatives

Chart 1. Alternative Temperature Times for 68°C (155°F)

Minimum Temperature	Time
63°C (145°F)	3 minutes
66°C (150°F)	1 minute
70°C (158°F)	<1 second (instantaneous)

Chart 2. Cooking Exemptions

FOOD	Provisions
Beef steak: WHOLE-MUSCLE, INTACT	Steak is cooked on top and bottom to a surface temperature of 63°C (145°F) or above and color change is achieved on all surfaces.
Eggs, FISH, MOLLUSCAN SHELLFISH, and other MEATS	CONSUMER information is provided as specified in section 7.3.6.1.2 or a VARIANCE is granted as specified in section 12.13 of the <i>VSP 2018 Operations Manual</i> .

Extracted from *FOOD Code*, Recommendations of the United States Public Health Service, 2013.

13.12 Chemicals Used in Washing or to Assist in the Peeling of Fruits and Vegetables

[Excerpted from 21 CFR 173.315]

TITLE 21--FOOD AND DRUGS

CHAPTER I--FOOD AND DRUG ADMINISTRATION, DEPARTMENT OF HEALTH AND HUMAN SERVICES (CONTINUED)

PART 173--SECONDARY DIRECT FOOD ADDITIVES PERMITTED IN FOOD FOR HUMAN CONSUMPTION--Table of Contents

Subpart D--Specific Usage ADDITIVES

Sec. 173.315 Chemicals used in washing or to assist in the peeling of fruits and vegetables.

Chemicals may be safely used to wash or to assist in the peeling of fruits and vegetables in accordance with the following conditions:

(a) The chemicals consist of one or more of the following:

(1) Substances generally recognized as safe in FOOD or covered by prior sanctions for use in washing fruits and vegetables.

(2) Substances identified in this subparagraph and subject to such limitations as are provided:

Adduct Mixture

Substance: A mixture of alkylene oxide adducts of alkyl alcohols and phosphate esters of alkylene oxide adducts of alkyl alcohols consisting of: [alpha]-alkyl (C₁₂- C₁₈)-omega-hydroxy-poly (oxyethylene) (7.5-8.5 moles)/poly (oxypropylene) block copolymer having an average molecular weight of 810; [alpha]-alkyl (C₁₂-C₁₈)- omega-hydroxy- poly (oxyethylene) (3.3-3.7 moles) polymer having an average molecular weight of 380, and subsequently esterified with 1.25 moles phosphoric anhydride; and [alpha]-alkyl (C₁₀-C₁₂)- omega-hydroxypoly (oxyethylene) (11.9-12.9 moles)/poly (oxypropylene) copolymer, having an average molecular copolymer, having an average molecular weight of 810, and subsequently esterified with 1.25 moles phosphoric anhydride.

Limitations: May be used at a level not to exceed 0.2 percent in lye-peeling solution to assist in the lye peeling of fruit and vegetables.

Aliphatic Acid Mixture

Substance: Aliphatic acid mixture consisting of valeric, caproic, enanthic, caprylic, and pelargonic acids.

Limitations: May be used at a level not to exceed 1 percent in lye peeling solution to assist in the lye peeling of fruits and vegetables.

Polyacrylamide

Substance: Polyacrylamide

Limitations: Not to exceed 10 parts per million in wash water.

Contains not more than 0.2 percent acrylamide monomer. May be used in the washing of fruits and vegetables.

Potassium Bromide

Substance: Potassium bromide

Limitations: May be used in the washing or to assist in the lye peeling of fruits and vegetables.

Sodium n-alkylbenzene-sulfonate

Substance: Sodium n-alkylbenzene-sulfonate (alkyl group predominantly C₁₂ and C₁₃ and not less than 95 percent C₁₀ to C₁₆).

Limitations: Not to exceed 0.2 percent in wash water. May be used in washing or to assist in the lye peeling of fruits and vegetables.

Sodium Dodecylbenzene-sulfonate

Substance: Sodium dodecylbenzene-sulfonate (alkyl predominantly C₁₂ and not less than 95 percent C₁₀ to C₁₆).

Limitations: Not to exceed 0.2 percent in wash water. May be used in washing or to assist in the lye peeling of fruits and vegetables.

Sodium 2 Ethyl-hexyl Sulfate

Substance: Sodium 2 ethyl-hexyl sulfate

Limitations: Not to exceed 0.2 percent in wash water. May be used in washing or to assist in the lye peeling of fruits and vegetables.

Sodium Hypochlorite

Substance: Sodium hypochlorite

Limitations: May be used in the washing or to assist in the lye peeling of fruits and vegetables.

Sodium Mono- and Dimethyl Naphthalene Sulfonates

Substance: Sodium mono- and dimethyl naphthalene sulfonates (mol. wt. 245-260)

Limitations: Not to exceed 0.2 percent in wash water. May be used in the washing or to assist in the lye peeling of fruits and vegetables.

(3) Sodium mono- and dimethyl naphthalene sulfonates (mol. wt. 245-260) may be used in the steam/scald vacuum peeling of tomatoes at a level not to exceed 0.2 percent in the condensate or scald water.

(4) Substances identified in this paragraph (a)(4) for use in flume water for washing sugar beets prior to the slicing operation and subject to the limitations as are provided for the level of the substances in the flume water:

[alpha]-Alkyl-omega-hydroxypoly-(oxyethylene)

Substance: [alpha]-Alkyl-omega-hydroxypoly-(oxyethylene) produced by condensation of 1 mole of C₁₁-C₄₈ 63₁₅ straight chain randomly substituted secondary alcohols with an average of 9 moles of ethylene oxide.

Limitations: Not to exceed 3 ppm.

Linear Undecylbenzenesulfonic Acid

Substance: Linear undecylbenzenesulfonic acid

Limitations: Not to exceed 3 ppm.

Dialkanolamide

Substance: Dialkanolamide produced by condensing 1 mole of methyl laurate with 1.05 moles of diethanolamine.

Limitations: Not to exceed 2 ppm.

Triethanolamine

Substance: Triethanolamine

Limitations: Not to exceed 2 ppm.

Ethylene Glycol Monobutyl Ether

Substance: Ethylene glycol monobutyl ether

Limitations: Not to exceed 1 ppm.

Oleic Acid

Substance: Oleic acid conforming with Sec. 172.860 of this chapter.

Limitations: Not to exceed 1 ppm.

Tetrapotassium Pyrophosphate

Substance: Tetrapotassium pyrophosphate

Limitations: Not to exceed 0.3 ppm.

Monoethanolamine

Substance: Monoethanolamine

Limitations: Not to exceed 0.3 ppm.

Ethylene Dichloride

Substance: Ethylene dichloride

Limitations: Not to exceed 0.2 ppm.

Tetrasodium ethylenediaminetetraacetate

Substance: Tetrasodium ethylenediaminetetraacetate

Limitations: Not to exceed 0.1 ppm.

(5) Substances identified in this paragraph (a)(5) for use on fruits and vegetables that are not raw agricultural commodities and subject to the limitations provided:

Hydrogen Peroxide

Substance: Hydrogen peroxide

Limitations: Used in combination with acetic acid to form peroxyacetic acid. Not to exceed 59 ppm in wash water.

1-Hydroxyethylidene-1,1-diphosphonic Acid

Substance: 1-Hydroxyethylidene-1,1-diphosphonic acid

Limitations: May be used only with peroxyacetic acid. Not to exceed 4.8 ppm in wash water.

Peroxyacetic Acid

Substance: Peroxyacetic acid

Limitations: Prepared by reacting acetic acid with hydrogen peroxide. Not to exceed 80 ppm in wash water.

(b) The chemicals are used in amounts not in excess of the minimum required to accomplish their intended effect.

(c) The use of the chemicals listed under paragraphs (a)(1), (a)(2), and (a)(4) is followed by rinsing with POTABLE WATER to remove, to the extent possible, residues of the chemicals.

(d) To assure safe use of the ADDITIVE:

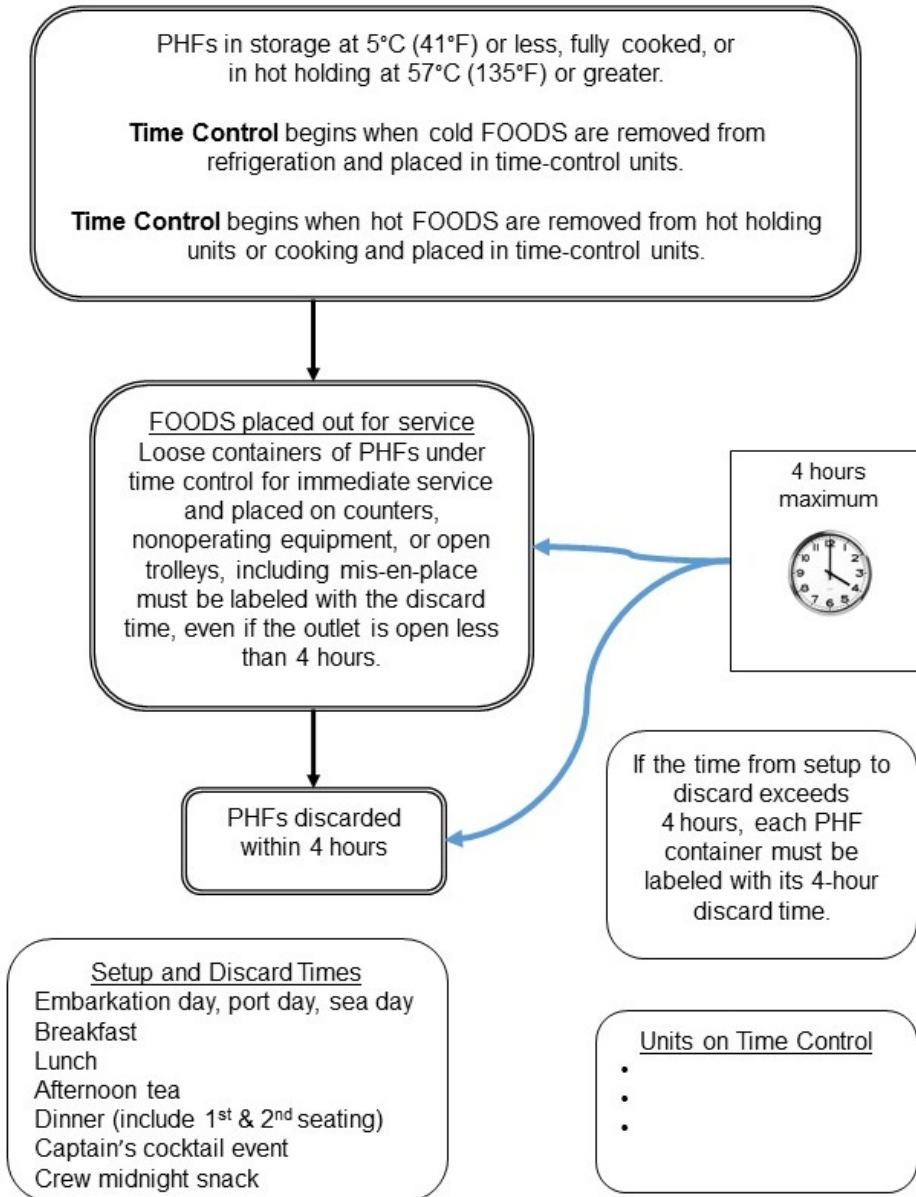
(1) The label and labeling of the ADDITIVE container shall bear, in addition to the other information required by the act, the name of the ADDITIVE or a statement of its composition.

(2) The label or labeling of the ADDITIVE container shall bear ADEQUATE use directions to assure use in compliance with all provisions of this section.

13.13 Time-Control Plan Examples

Sample Time-Control Plan for POTENTIALLY HAZARDOUS FOODS (PHFs)

Location: _____



Time-Control Plan

Location: _____

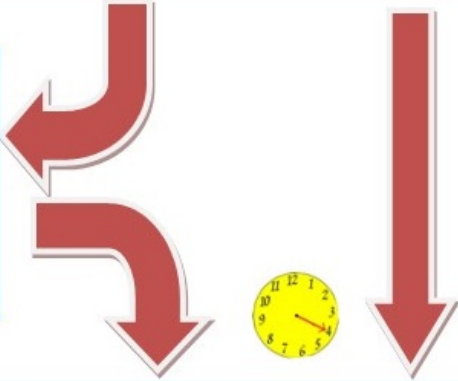
Operation Hours:
Breakfast:
Embarkation Day – 5:30 hours–9:30 hours
Port/Sea Days – 6:30 hours–10:30 hours
Lunch: 11:30 hours–14:00 hours
Dinner 1st: 17:30 hours–19:45 hours
Dinner 2nd: 20:00 hours–21:45 hours

Units on Time Control:
Roll-in refrigerators: 104, 105, 106, 325, and 326
Cold soup well port/starboard 146A and 147B
All bains marie including soup line
All FOOD preparation counters

POTENTIALLY HAZARDOUS FOODS are stored at 5°C (41°F) or below or 57°C (135°F) or above

All PHFs, including mis-en-place on the FOOD preparation counters, are on time control.

Containers of PHFs are labeled with the start time and 4-hour discard time.



Time Control begins when cold FOODS are removed from refrigeration and placed in time-control units.

Time Control begins when hot FOODS are removed from hot holding units or cooking and placed in time-control units.



All PHFs are discarded at the end of the service period.

13.14 List of Some Hard and Semisoft Cheeses Exempt from Datemarking

The cheeses listed below are exempted from 7-day datemarking:

Abertam	Limburger
Appenzeller	Lorraine
Asadero	Manchego
Asiago medium or old	Milano
Asiago soft	Monterey
Battelmatt	Muenster
Bellelay (blue veined)	Oaxaca
Blue	Oka
Bra Brick	Parmesan
Camosum	Pecorino
Chantelle	Port du Salut
Cheddar	Provolone
Christalina	Queso Anejo
Colby	Queso Chihuahua
Coon	Queso de Bola
Cotija	Queso de la Tierra
Cotija Anejo	Queso de Prensa
Derby	Reggiano
Edam	Robbiole
Emmentaler	Romanello
English Dairy	Romano
Fontina	Roquefort (blue veined)
Gex (blue veined)	Samsøe
Gjetost	Sapsago
Gloucester	Sassenage (blue veined)
Gorgonzola (blue veined)	Stilton (blue veined)
Gouda	Swiss
Gruyere	Tignard (blue veined)
Havarti	Tilsiter
Herve	Trappist
Konigskase	Vize
‘Lapland	Wenssleydale (blue veined)

13.15 Consumer Advisory Examples

13.15.1 Menu Example

*Hamburgers
Chicken
Potato Salad
*Seared Tuna
French Fries
House Salad

*Public Health Advisory: Consuming raw or undercooked MEATS, POULTRY, seafood, shellfish, or eggs may increase your risk for foodborne illness, especially if you have certain medical conditions.

13.15.2 Point-of-Service Examples

13.15.2.1 At an Omelet Station

Eggs can be cooked to order.

Public Health Advisory: Consuming raw or undercooked eggs may increase your risk for foodborne illness, especially if you have certain medical conditions.

13.15.2.2 At a Hamburger Grill

Hamburgers and cheeseburgers can be cooked to order.

Public Health Advisory: Consuming raw or undercooked MEATS may increase your risk for foodborne illness, especially if you have certain medical conditions.

13.15.2.3 At a Buffet Station

Cold Smoked Salmon is served undercooked.

Public Health Advisory: Consuming raw or undercooked seafood may increase your risk for foodborne illness, especially if you have certain medical conditions.

13.16 Warewashing Evaluation

13.16.1 Introduction

13.16.1.1 Methodology Source

The following WAREWASHING machine evaluation procedure was compiled from the NSF International (NSF) brochure *FOOD Service: Recommended Field Evaluation Procedures for Spray-type Dishwashing Machines* (1991), and *FOOD Code* (2013).

ANSI/NSF 3-2017, *Commercial Spray-type Dishwashing and Glasswashing Machines*, and the *VSP 2018 Operations Manual* should be consulted for recommended construction and operational parameters.

13.16.1.2 Recommended Evaluation Equipment

The following EQUIPMENT to conduct WAREWASHING evaluations is recommended:

- Thermocouple or thermistor TEMPERATURE-MEASURING DEVICE for warewasher operational temperatures.
- Maximum registering TEMPERATURE-MEASURING DEVICE or temperature-sensitive tapes for verifying hot water warewasher final rinse temperature, 73°C (160°F).
- Optional: Calibrated melting temperature wax crayons with melt points set at 82°C (180°F) and another at 91°C (195°F).
- Pressure gauge, as applicable, for determining in-line pressure of hot water at injection point of warewasher in the range of 100-170 kilopascals (15-25 pounds per square inch).
- Chemical test kits for different chemical SANITIZER types used on the vessel.
- Flashlight.
- Tape measure.
- Watch or stopwatch.

13.16.1.2.1 Calibration

Calibrate TEMPERATURE-MEASURING DEVICES and pressure gauges against standards to ensure reliable warewasher evaluations.

Maintain chemical test kits and temperature sensitive tapes as specified by their manufacturers to ensure accuracy.

13.16.1.2.2 Mercury Spills

Use mercury-filled maximum registering TEMPERATURE-MEASURING DEVICES carefully during the evaluations; these devices are subject to breakage. If they break, clean up thoroughly before WAREWASHING operations resume.

13.16.2 Machines Data Plates

13.16.2.1 Data Plate Required

Review the required manufacturer's data plate for correct operating parameters.

- If the data plate indicates a flow pressure, the machine must have a gauge or a gauge valve to measure it.
- If the data plate does not indicate a flow pressure, the machine is not required to have a gauge or a gauge valve.

13.16.2.2 Temperature Requirements

Temperatures stated on the warewash machine data plate are considered minimums unless a specified range is given.

13.16.2.3 Conform to ANSI/NSF 3-1996

The warewash machine temperatures must conform to those specified in these guidelines for the specific type of machine. For those manufactured to different temperature standards, evidence must be furnished that they at least conform to the minimum equivalent standards of ANSI/NSF 3-2008, *Commercial Spray-type Dishwashing and Glasswashing Machines*.

13.16.3 Evaluation Procedures

13.16.3.1 Operational Evaluation

The VSP EHO will evaluate the WAREWASHING as follows:

- Dishes properly prescraped and racked.
- Machine prewash scrap trays clear of excessive soil and debris.
- Curtains and baffles on conveyor type machines intact and in their proper position.
- Conveyor speed and cycle times set according to manufacturer's specifications.
- Overflow standpipe installed and not blocked or leaking.
- Wash and rinse nozzles properly aligned and providing a uniform spray pattern.
- Wash and rinse nozzles clear of obstructions.
- Wash and rinse manifolds in good repair, properly installed in the machine, and end caps installed.
- Heating elements used in tanks free of mineral or other deposits.
- Rinse supply line strainer clear of debris.

- Wash and rinse tanks and final rinse manifold TEMPERATURE-MEASURING DEVICES accurate to ± 1.5 °C (± 3 °F).
- Pressure regulator functioning properly.
- Flow pressure within the range specified on the data plate and between 34.5-207 kilopascals (5-30 pounds per square inch).

13.16.3.2 Temperature Evaluation

13.16.3.2.1 *Manufacturer's Instructions*

Install and operate the machine in accordance to the manufacturer's instructions.

13.16.3.2.2 *Warmup*

Run the machine through at least two complete cycles before testing unless it has been operating just before the evaluation. On conveyor machines, run at least two racks through the machine.

13.16.3.2.3 *Additional Warmup*

When minimum temperatures are not indicated on machine-mounted TEMPERATURE-MEASURING DEVICES, additional pre-evaluation cycles may be run to determine if higher temperatures are possible.

13.16.3.2.4 *Tank Thermometer Calibration*

Take temperatures of the wash water and pumped rinse directly from the tanks of the machines and compare them against the machine-mounted TEMPERATURE-MEASURING DEVICES. If possible, place the evaluation TEMPERATURE-MEASURING DEVICE probe in the tank near the machine-mounted TEMPERATURE-MEASURING DEVICE probe.

13.16.3.2.5 *Sanitizing Rinse TMDs*

Use a maximum registering TEMPERATURE-MEASURING DEVICE, remote sensing thermocouple, or nonreversible thermolabels such as paper TEMPERATURE-MEASURING DEVICES that turn from silver to black or similar device to confirm the effectiveness of heat SANITIZATION.

13.16.3.2.6 *Rinse Exposure*

Attach the maximum registering TEMPERATURE-MEASURING DEVICE in a vertical position in a rack that is exposed to the final sanitizing rinse spray at the approximate level of a plate. Attach nonreversible thermolabels to the center of a dry ceramic plate.

13.16.3.2.7 High Wash/Rinse Temperature Factor

Factor the effect of the temperatures of the wash water and pumped rinse into the evaluation if tank thermometers indicate they are above 71°C (160°F).

If the wash and or rinse tank temperatures are greater than or equal to 71°C (160°F), verify the final sanitizing rinse temperature using one of the methods in section 13.16.3.2.9 or another ISOLATION method where a rapid response TEMPERATURE-MEASURING DEVICE is held at plate level in the final sanitizing rinse spray for at least 8 seconds. The maximum-registering TEMPERATURE-MEASURING DEVICE may also be checked at the end of each part of the cycle to verify that the wash and rinse temperatures have not been in excess of 71°C (160°F).

13.16.3.2.8 Effective Sanitation

Evaluate effective SANITIZATION by noting that in a mechanical operation, the temperature of the fresh hot water sanitizing rinse as it enters the manifold must not be more than 90°C (194°F) or less than

- 74°C (165°F) for a stationary rack, single-temperature machine.
- 82°C (180°F) for all other machines.
- 71°C (160°F) at the UTENSIL surface, as measured by an irreversible registering temperature indicator.

13.16.3.2.9 Indirect Methods

The final rinse spray temperature may be indirectly evaluated by using a nonreversible thermolabel attached to the manifold or final rinse spray arm near the hub or by using calibrated melting temperature wax crayons. Make a mark on a dry portion of the final sanitizing rinse manifold or supply line with a crayon that melts at 82°C (180°F) and another that melts at 91°C (195°F).

Another acceptable test to establish the final sanitizing rinse temperature (manifold) is to dry the final sanitizing rinse spray arm as near to the manifold entry into the machine as possible and affix an 82°C (180°F) thermolabel. The thermolabel should be left in place through one full warewash cycle. There may be slight temperature decreases at positions distant from the manifold entry into the machine.

A third method is to attach a maximum registering thermometer to the end of a rod and hold the thermometer in the final rinse spray at plate level for 8 seconds.

After any of the three of the indirect method tests above, assess the spray pattern from the final rinse spray arm to ensure that the spray pattern is effective.

For a stationary rack machine, the final rinse temperature can be evaluated by running the machine with a maximum registering thermometer at plate level. Stop the machine at the end of the wash cycle to check the temperature, and again at the end of the final rinse cycle.

13.16.3.3 Chemical Sanitizing Evaluation

Obtain sample at the end of the final chemical sanitizing rinse cycle and use a SANITIZER test kit to confirm the SANITIZER level is at the minimum specified on machine data plate and in these guidelines.

13.16.4 Routine Monitoring

13.16.4.1 Periodic Detailed Evaluations

Proper WAREWASHING is critical to protecting the health of a vessel's passengers. The procedures provided in this annex may assist the vessel crew in periodically verifying the proper operation of its WAREWASHING machines. Following the manufacturer's recommendations for maintenance and operation will ensure the WAREWASHING machines continue to meet the criteria of these guidelines and standards of ANSI/NSF 3-1996, *Commercial Spray-type Dishwashing and Glasswashing Machines*.

13.16.4.2 Startup Evaluations

During each WAREWASHING machine's startup, the proper setup and operation of the EQUIPMENT should be verified with basic checks. These include checks of the tank, manifold, and curtain assemblies to ensure they are properly installed. Proper operating temperatures should be verified to meet the minimum required temperatures during the start-up.

13.16.4.3 Routine Operation Evaluations

Periodic operation and temperature checks by the WAREWASHING crew during the WAREWASHING time should detect problems soon after they occur. The person removing the clean and sanitized ware must examine each piece to determine if it is clean. Periodic management checks of the WAREWASHING process during operation verify that the machines are operating properly and the UTENSILS processed are indeed clean and sanitized.

13.16.4.4 Simple Records

Simple records can assist in the warewash machine monitoring process. A review of these records can ensure proper monitoring is being conducted and assist in determining a gradual or severe malfunction of the machine.

13.17 Inspection Report

13.17.1 Report Form

A copy of the VSP Inspection Report form follows on the next page.

During the implementation of the *VSP 2018 Operations Manual*, an electronic version of this form will also be used. Copies of the electronic version will be returned to the cruise line by email.



VESSEL SANITATION INSPECTION REPORT

Vessel Name		Inspection Date		Port	Results Presented to	Score:
Cruise Line	No. Pax.	No. Crew	Inspection Type	Inspected by		

Item No.	Point Value	Description	Bold = Critical Item
DISEASE REPORTING			
01	4	Disease reporting	
02	1	Medical logs maintenance	
POTABLE WATER			
03	5	Bunker / production source; Halogen residual	
04	5	Distribution system halogen residual	
05	2	Distribution system halogen analyzer calibrated	
06	2	Halogen analyzer chart recorder maintenance, operation, records; Micro sampling, records	
07	3	System protection cross-connections, backflow; Disinfection	
08	1	Filling hoses, caps, connections, procedures; Sample records, valves; System construction, maintenance	
RECREATIONAL WATER FACILITIES			
09	3	RWF halogen residuals	
10	2	RWF maintenance, safety equipment	
FOOD SAFETY			
PERSONNEL			
11	5	Food handlers infections, communicable diseases	
12	4	Hands washed; Hygienic practices	
13	3	Management, knowledge, monitoring	
14	1	Outer clothing clean; Jewelry, hair, hand sanitizers	
FOOD			
15	5	Food source, sound condition; Food reservice	
16	5	Potentially hazardous food temperatures	
17	2	Temperature practices; Thawing	
18	3	Cross-contamination	
19	2	Food protection; Original containers; labeling; In-use food dispensing, preparation utensils	
MEDICAL LOG REVIEW			
Cruise – Start / End / Port / PAX / ILL / CREW / ILL			
1.			
2.			
3.			
4.			
5.			

Item No.	Point Value	Description	Bold = Critical Item
EQUIPMENT			
20	2	PHF temperature maintenance facilities; Food-contact surfaces; Food TMDs	
21	1	Nonfood-contact surfaces; Ambient TMDs	
22	2	Warewashing facilities; TMDs; Test kits	
23	2	Prewash; Wash and rinse solutions	
24	3	Sanitizing rinse	
25	1	Wiping cloths / chef's towels	
26	3	Food-contact surfaces equipment / utensils clean; Safe materials	
27	1	Nonfood-contact surfaces equipment / utensils clean	
28	2	Equipment / utensil / linen / single / service storage handling dispensing; Cleaning frequency	
TOILET AND HANDWASHING FACILITIES			
29	3	Facilities convenient, accessible, design, installation	
30	1	Hand cleanser, sanitary towels, waste receptacles; Handwashing signs; Maintenance	
TOXIC SUBSTANCES			
31	3	Toxic items	
FACILITIES			
32	1	Solid waste containers	
33	1	Decks / bulkheads / deckheads	
34	1	Plumbing fixtures / supply lines / drain lines / drains	
35	2	Liquid waste disposal	
36	1	Lighting	
37	1	Rooms / equipment venting	
38	1	Unnecessary articles, cleaning equipment; Unauthorized personnel	
ENVIRONMENTAL HEALTH			
39	3	IPM program effective; Approved pesticide application	
40	1	IPM procedures; Outer openings protection	
41	2	Housekeeping	
42	1	Child activity centers	
43	1	Ventilation	
KNOWLEDGE			
44	2	Person in charge, Knowledge	

13.18 Corrective-Action Statement

13.18.1 Introduction

13.18.1.1 Purpose

VSP established a procedure for postinspection reporting of corrective actions to encourage the correction of deficiencies noted during an inspection. A signed corrective action statement will not affect the inspection score.

13.18.1.2 Critical Item Monitoring

The corrective-action statement, particularly for CRITICAL ITEMS, should include a management monitoring plan to ensure that the procedure or process that was out of control will be monitored and controlled in the future. The public health goal of the inspection is to prevent the recurrence of the critical deficiency in the specific instance where it was found and generally in future similar operations aboard the vessel.

13.18.1.3 Publicly Available

The corrective-action statement will be appended to the final inspection report for future reference and public distribution via the VSP website.

13.18.1.4 Email Submission

The corrective action statement may be submitted to VSP by electronic mail. Please send the statement to vsp@cdc.gov; include the vessel name, corrective-action statement, and inspection date in the message subject line. Submission as an attached word processing format file is preferable.

13.18.1.5 Mail Submission

The corrective-action statement may also be mailed to the following:

CDC/Vessel Sanitation Program
1850 Eller Drive, Suite 101
Ft. Lauderdale, FL 33316
USA

13.18.2 Format

Example Statement

Date

CDC/Vessel Sanitation Program

1850 Eller Drive, Suite 101

Ft. Lauderdale, FL 33316

USA

Dear Sir:

The following actions have been taken to correct each of the deficiencies noted during the inspection of (Name of Vessel) on (Date) at (Port).

Item Number	Deficiency/Corrective Action 1.
-------------	---------------------------------

1.

2.

3.

(Continue until all violations have been listed.)

Sincerely,

(Signature)

Name

Title

Company

13.19 Summary of Sanitation Inspections of International Cruise Ships

13.19.1 Introduction

Every vessel that has a foreign itinerary and carries 13 or more passengers is subject to twice-yearly inspections and, when necessary, to reinspection by the Centers for Disease Control and Prevention's VSP. To ensure a clean and healthful environment, cruise ships must meet the criteria established by VSP.

The score and the complete report for each inspection are published on the VSP website (www.cdc.gov/nceh/vsp).

The ship's level of sanitation is acceptable to VSP if its score on the inspection is 86 or higher.

13.19.2 Online Information

The VSP website has a searchable database of inspection report summaries and lists. The complete inspection report information is also retrievable.

Lists available on the VSP website include the following:

- Advanced Cruise Ship Inspection Search.
- Green Sheet Report.
- Cruise Ship Inspection Score 100.
- VARIANCES by Section.

These lists show the data by

- Ship name.
- Cruise line.
- Inspection date.
- Score (all scores, scores of 86 or higher [satisfactory scores], and scores of 85 or lower [unsatisfactory scores]).

Further information can be obtained on a particular ship, including all scores for that ship and an inspection report preview.

The VSP website also provides the Inspection Detail Report for each ship inspection. This report provides a categorical review of the deficiencies noted along with the number of points deducted for that category and the numerical score for the inspection of a particular ship. Details of the inspection with the specific deficiencies and recommendations are also available from this page.

Inspection report data are also searchable from the VSP database for the following search categories:

- Ship name.
- Cruise line.
- Inspection date.

- Most recent date.
- All dates.
- Range of dates.
- Score (all scores, scores of 86 or higher [satisfactory scores], and scores of 85 or lower [unsatisfactory scores]).

13.19.3 Contact Information

Further information on VSP, inspection results, and vessels' corrective action statements may be obtained

- On the VSP website (www.cdc.gov/nceh/vsp).
- Through email (vsp@cdc.gov).
- By telephone (800-323-2132).
- By fax (770-488-4127).

14.0 Bibliography

This section includes the following subsections:

- 14.1 Introduction
- 14.2 Authority
- 14.3 Definitions
- 14.4 ACUTE GASTROENTERITIS Surveillance
- 14.5 POTABLE WATER
- 14.6 RECREATIONAL WATER FACILITIES
- 14.7 FOOD Safety
- 14.8 INTEGRATED PEST MANAGEMENT
- 14.9 Housekeeping
- 14.10 CHILD ACTIVITY CENTERS
- 14.11 HVAC Systems, Fountains, Misting Systems, Humidifiers, and Showers
- 14.12 Administrative Guidelines

14.1 Introduction

Centers for Disease Control and Prevention, NCEH. 1999. Vessel Sanitation Program: Charting a Healthier Course.

Centers for Disease Control and Prevention, NCEH. 1999. www.cdc.gov/nceh/vsp.

Centers for Disease Control and Prevention, NCEH. 1989, 2000, 2005, 2011. Vessel Sanitation Program operations manual.

14.2 Authority

Code of Federal Regulations 42 CFR 71.31. Health Measures at U.S. Ports: Communicable Diseases. General provisions.

Code of Federal Regulations 42 CFR 71.32. Health Measures at U.S. Ports: Communicable Diseases. Persons, carriers, and things.

Code of Federal Regulations 42 CFR Section 71.41. General Provisions. Foreign Quarantine - Requirements Upon Arrival at U.S. Ports: Sanitary Inspection.

The Public Health Service Act, 42 U.S.C. Section 264. Quarantine and Inspection—Regulations to control communicable diseases.

The Public Health Service Act, 42 U.S.C. Section 269. Quarantine and Inspection—Bills of health.

14.3 Definitions

Food and Drug Administration. 2017. Food Code, Recommendations of the United States Public Health Service.

Centers for Disease Control and Prevention. 2016. Model Aquatic Health Code (MAHC): A National Model Swimming Pool and Spa Code. 2nd edition.

14.4 Acute Gastroenteritis Surveillance

Addiss DG, Yashuk JC, Clapp DE, Blake PA. 1989. Outbreaks of diarrhoeal illness on passenger cruise ships, 1975–85. *Epidemiol Infect.* 103(1):63–72.

Centers for Disease Control and Prevention. 1990. Recommendations for collection of laboratory specimens associated with outbreaks of gastroenteritis. *MMWR.* 39RR-14.

Centers for Disease Control and Prevention, NCEH. 1999. Disease Surveillance and Outbreak Investigation. www.cdc.gov/nceh/vsp/pub/biblio/biblio.htm

Cramer EH, Blanton C, Browne L, Vaughan G, Bopp C, Forney D. 2006. Epidemiology of gastroenteritis on cruise ships, 2001–2004: the impact of noroviruses. *Am J Prev Med.* 30(3):252–7.

Cramer EH, Gu DX, Durbin RE, Vessel Sanitation Program Environmental Health Inspection Team. 2003. Diarrheal disease on cruise ships, 1990–2000: the impact of environmental health programs. *Am J Prev Med.* 24(3):227–33.

Dalton C, Mintz ED, Wells JG, Bopp CA, Tauxe RV. 1999. Outbreaks of enterotoxigenic *Escherichia coli* infection in American adults: a clinical and epidemiologic profile. *Epidemiol Infect.* 123:9–16.

Daniels NA, Neimann J, Karpati A, Parashar UD, Greene KD, Wells JG, et al. 2000. Traveler’s diarrhea at sea: three outbreaks of waterborne enterotoxigenic *Escherichia coli* on cruise ships. *J Infect Dis.* 181:1491–5.

Dannenberg AL, Yashuk JC, Feldman RA. 1982. Gastrointestinal illness on passenger cruise ships, 1975–1978. *Am J Publ Health.* 72:484–8.

Davies JW, Cox KG, Simon WR, Bowmer EJ, Mallory A. 1972. Typhoid at sea: epidemic aboard an ocean liner. *Can Med Assoc J.* 106:877–83.

Freedom of Information Act. 5 U.S.C. Section 552. Administrative Procedure—Public information; agency rules, opinions, orders, records, and proceedings.

Freedom of Information Act. 5 U.S.C. Section 552a. Privacy Act—Records maintained on individuals.

Freeland AL, Vaughan GH Jr, Banerjee SN. 2016. Acute gastroenteritis on cruise ships United States, 2008–2014. *MMWR.* 65(1):1–5.

Gunn RA, Terranova WA, Greenberg HB, Yashuk J, Gary GW, Wells JG, et al. 1980. Norwalk virus gastroenteritis aboard a cruise ship: an outbreak of five consecutive cruises. *Am J Epidemiol.* 1122:820–7.

Hall AJ, Vinjé J, Lopman B, Park GW, Yen C, Gregoricus N, et al. 2011. Updated norovirus outbreak management and disease prevention guidelines. *MMWR.* 60(RR03);1-15.

Herwaldt BL, Lew JF, Moe CL, Lewis DC, Humphrey CD, Monroe SS, et al. 1994. Characterization of a variant strain of Norwalk virus from a food-borne outbreak of gastroenteritis on a cruise ship in Hawaii. *J Clin Microbiol.* 4:861–6.

Ho MS, Glass RI, Monroe SS, Madore HP, Stine S, Pinsky PF, et al. 1989. Viral gastroenteritis aboard a cruise ship. *Lancet.* 2(8669):961–5.

IAMFES. 2016. Procedures to Investigate Waterborne Illness, 3rd Edition. Des Moines, IA.

IAMFES. 2011. *Procedures to Investigate Foodborne Illness*, 6th Edition. Des Moines, IA.

Khan AS, Moe CL, Glass RI, Monroe SS, Estes MK, Chapman LK, et al. 1994. Norwalk virus-associated gastroenteritis traced to ice consumption aboard a cruise ship in Hawaii: comparison and application of molecular method-based assays. *J Clin Microbiol.* 2:318– 22.

Koo D, Maloney K, Tauxe R. 1996. Epidemiology of diarrheal disease outbreaks on cruise ships, 1986 through 1993. *JAMA.* 7:545–7.

Lew JF, Swerdlow DL, Dance ME, Griffin PM, Bopp CA, Gillenwater MJ, et al. 1991. An outbreak of shigellosis aboard a cruise ship caused by a multiple-antibiotic-resistant strain of *Shigella flexneri*. *Am J Epidemiol.* 134(4):413–20.

Marks PJ, Vipond IB, Carlisle D, Deakin D, Fey RE, Caul EO. 2000. Evidence for airborne transmission of Norwalk-like virus (NLV) in a hotel restaurant. *Epidemiol. Infect.* 124: 481-487.

Merson MH, Hughes JM, Lawrence DN, Wells JG, D’Agnese JJ, Yashuk JC. 1976. Food- and waterborne disease outbreaks on passenger cruise vessels and aircraft. *J Milk Food Technol.* 39:285–8.

Merson MH, Hughes JM, Wood BT, Yashuk JC, Wells JG. 1987. Gastrointestinal illness on passenger cruise ships. *JAMA.* 231:723–7.

Merson MH, Tenney JH, Meyers JD, Wood BT, Wells JG, Rymzo W, et al., 1975. Shigellosis at sea: an outbreak aboard a passenger cruise ship. *Am J Epidemiol.* 101:165– 75.

Nguyen CH, Qualls NL, O’Toole TE, 1989. A cost-effectiveness analysis of the Vessel Sanitation Program. Centers for Disease Control and Prevention, U.S. Public Health Service; Atlanta, GA.

Park GW, Lee D, Treffiletti A, Hrsak M, Shugart J, Vinjé J. 2015. Evaluation of a new environmental sampling protocol for detection of human norovirus on inanimate surfaces. *Appl Environ Microbiol* 81(17):5987-92.

Sawyer LA, Murphy JJ, Kaplan JE, Pinsky PF, Chacon D, Walmsley S, et al. 1988. 25- to 30-nm virus particle associated with a hospital outbreak of acute gastroenteritis with evidence for airborne transmission. *Am J Epidemiol.* 127:1261–71.

Wikswa ME, Cortes J, Hall AJ, Vaughan G, Howard C, Gregoricus N, Cramer EH. 2011. Disease transmission and passenger behaviors during a high morbidity norovirus outbreak on a cruise ship, January 2009. *Clin Infect Dis.* 52(9):1116-22.

14.5 Potable Water

American Public Health Association. 2017. *Standard methods for the examination of water and wastewater*. 23rd ed. Washington, DC.

American Society of Sanitary Engineering. 2004. ASSE #1032—2004, Dual check valve type backflow preventers. Westlake, OH.

American Society of Sanitary Engineering. 2008. ANSI/ASSE #1004—2008/1990, Commercial dishwashing machines. Westlake, OH.

American Society of Sanitary Engineering. 2005. ASSE #1014—2005, Hand-held showers. Westlake, OH.

- American Society of Sanitary Engineering. 2011. ASSE #1013—2011, Reduced pressure principle backflow preventers. Westlake, OH.
- American Society of Sanitary Engineering. 2011. ASSE #1015—2011, Double check backflow prevention assembly. Westlake, OH.
- American Society of Sanitary Engineering. 2016. ANSI/ASSE #1052—2016, Hose connection backflow preventers. Westlake, OH.
- American Society of Sanitary Engineering. 1990. ANSI/ASSE #1009—1990, Commercial food waste grinder units. Westlake, OH.
- American Society of Sanitary Engineering. 2011. ANSI/ASSE #1047—2011, Reduced pressure detector backflow preventer. Westlake, OH.
- American Society of Sanitary Engineering. 2011. ANSI/ASSE #1048—2011, Double check detector assembly backflow preventer. Westlake, OH.
- American Society of Sanitary Engineering. 2013. ANSI/ASSE #1056—2013, Performance requirements for spill resistant vacuum breaker assemblies. Westlake, OH.
- American Society of Sanitary Engineering. 2016. ASSE#1055—2016, Chemical dispensing systems. Westlake, OH.
- American Society of Sanitary Engineering. 2004. ANSI/ASSE #1024—2004, Dual check valve type backflow preventers, Westlake, OH.
- American Society of Sanitary Engineering. 2004. ASSE #1020—2004, Pressure vacuum breaker assembly. Westlake, OH.
- American Society of Sanitary Engineering. 2004. ANSI/ASSE #1011—2004, Hose connection vacuum breakers. Westlake, OH. American Society of Sanitary Engineering, 1995.
- American Society of Sanitary Engineering. 2008. ANSI/ASSE #1001—2008, Atmospheric type vacuum breakers. Westlake, OH.
- American Water Works Association. 2006. Water chlorination and chloramination principles and practices, 2nd edition. Denver, CO.
- American Water Works Association. 2015. Recommended practice for backflow prevention and cross-connection control, 4th edition. Denver, CO.
- American Water Works Association. 1992. ANSI/AWWA C651-92: Disinfecting water mains. Denver, CO.
- American Water Works Association. 2011. ANSI/AWWA C652-11: Disinfection of water-storage facilities. Denver, CO.
- American Water Works Association. 2001. Emergency planning for water utility management, 4th edition. Denver, CO. American Water Works Association. 1995. Electrodialysis and electrodialysis reversal. Denver, CO.
- American Water Works Association. 1997. ANSI/AWWA C653-97: Disinfection of water treatment plants. Denver, CO.
- American Water Works Association. 2016. Simplified procedures for water examination, 6th edition. Denver, CO.

- American Water Works Association. 2007. Reverse osmosis and nanofiltration, 2nd edition. Denver, CO.
- American Water Works Association. 2013. Water distribution operator training handbook, 4th edition. Denver, CO.
- ANSI/ASSE.2008. #1012—2008, Backflow preventers with intermediate atmospheric vent. Westlake, OH.
- ANSI/ASSE. 2017. #1022—2017, Backflow preventer for carbonated beverage machines. Westlake, OH.
- Clesceri LS, Greenberg AE, Eaton AD, eds. 2012. Standard methods for the examination of water and wastewater. 22nd edition. American Public Health Association, American Water Works Association and Water Environment Federation, Washington, DC.
- Code of Federal Regulations, Title 40 Section 141 National Primary Drinking Water Regulations.
- Foundation for Cross-Connection Control and Hydraulic Research. Manual of cross-connection control, 10th edition. Los Angeles, CA: University of Southern California.
- NSF International. 2013. ANSI/NSF Standard 60-2013 drinking water treatment chemicals—health effects. Ann Arbor, MI.
- NSF International.2013. ANSI/NSF Standard 61-2013 drinking water system components—health effects. Ann Arbor, MI.
- U.S. Environmental Protection Agency. 1989. Cross-connection control manual.
- World Health Organization. 2011. Guidelines for drinking-water quality, volume 1: recommendations. 4th edition. Geneva, Switzerland.
- World Health Organization. 1996. Guidelines for drinking-water quality, volume 2: health criteria and other supporting information. 2nd edition. Geneva, Switzerland.
- World Health Organization. 1997. Guidelines for Drinking-water quality, world health organization, volume 3: surveillance and control of community water supplies. 2nd edition. Geneva, Switzerland.
- World Health Organization. 2017. Guidelines for drinking-water quality, 4th edition, addendum to volume 1: recommendations. Geneva, Switzerland.
- World Health Organization. 2002. Guidelines for drinking-water quality, second edition, addendum to volume 2: health criteria and other supporting information. Geneva, Switzerland.

14.6 Recreational Water Facilities

- American National Standards Institute/National Spa & Pool Institute. 2016. NSF/ANSI 50-2016. Standard for public swimming pools and standard for public spas, standard 50: circulation system components and related materials for swimming pools, spas/hot tubs. Ann Arbor, MI: NSF International. <http://www.nsf.org/>.
- ASME International. 1987. ASME/ANSI A112.19.8M Suction fittings for use in swimming pools, wading pools, spas, hot tubs, and whirlpool bathtub appliances (Reaffirmed 1996). New York.
- California Code of Regulations, Title 22 Chapter 20.

- Centers for Disease Control and Prevention. 2016. Model Aquatic Health Code (MAHC): A National Model Swimming Pool and Spa Code. 2nd edition.
- Centers for Disease Control and Prevention. 2001. Notice to Readers: Responding to fecal accidents in disinfected swimming venues. *MMWR*. 50(20):416–7.
- Centers for Disease Control and Prevention. 1997. Final recommendations to minimize transmission of Legionnaires' disease from whirlpool spas on cruise ships.
- Centers for Disease Control and Prevention, Division of Parasitic Diseases. 1999. Information for swimming pool operators: prevention of cryptosporidiosis.
- Code of Federal Regulations, Title 16, Part 1450. Virginia Graeme Baker Pool and Spa Safety Act.
- Environmental Protection Agency. 2003. Ultraviolet disinfection manual. EPA-D-03-007.
- Environmental Protection Agency. 1986. Disinfection with ultra violet light—design, construct and operate for success. Cincinnati, OH.
- Environmental Protection Agency. 1988. Ultra violet disinfection: special evaluation project. EPA Region 5, Chicago, IL.
- Florida Administrative Code. Chapter 64E-9. Public swimming pools and bathing places.
- Gallagher TE. 1996. Comprehensive water quality testing of high-use public spas. *J Environ Health*. 58;7:11.
- Kebabjian R. 1995. Disinfection of public pools and management of fecal accidents. *J Environ Health*. 58;1:8.
- Lemmon JM, McAnulty JM, Bawden-Smith J. 1996. Outbreak of cryptosporidiosis linked to an indoor swimming pool. *Med J Australia*. 165:613.
- National Pool and Spa Institute. 2003. ANSI/NSPI-1 2003 standard for public swimming pools. Alexandria, VA.
- National Pool and Spa Institute. 1996. Symposium on water chemistry and disinfection 1996. Alexandria, VA.
- National Pool and Spa Institute. 1997. Chemical dynamics within the pool and spa environment 1997. Alexandria, VA.
- National Pool and Spa Institute. 1999. ANSI/NSPI-2 1999 standard for public spas. Alexandria, VA.
- National Swimming Pool Foundation. 2017. Pool and spa operator handbook.
- New York Codes, Rules and Regulations, Title 10, Chapter 1, Part 6. Swimming pools, bathing beaches and recreational aquatic spray grounds.
- NSF International. 2016. ANSI/NSF Standard 50-2016. Equipment for swimming pools, spas, hot tubs and other recreational water facilities. Ann Arbor, MI.
- NSF International. 2016. ANSI/NSF Standard 14-2016. Plastics piping system components and related materials. Ann Arbor, MI.
- NSF International. 2013. ANSI/NSF Standard 60-2013. Drinking water treatment chemicals—health effects. Ann Arbor, MI.

NSF International. 2013. ANSI/NSF Standard 61-2013. Drinking water system components—health effects. Ann Arbor, MI.

Ormecci B, Ishida GA, Linden KG, 2005. UV disinfection of chlorinated water: impact on chlorine concentration and UV dose delivery. *J Water Suppl Res Technol.* 54(3):189–99.

Rennell DS, ed. 1992. Basic pool and spa technology, 2nd edition. National Spa & Pool Institute. Alexandria, VA.

Rowley W. Entrapment and evisceration study. National Swimming Pool Foundation. Merrick, NY.

Shin GA, Linden KG, Arrowood MJ, Sobsey MD. 2001. Low-pressure UV inactivation and DNA repair potential of cryptosporidium parvum oocysts. *Appl Environ Microbiol.* 67(7):3029–32.

U.S. Army, CHPPM. 1996. Controlling contamination from fecal accidents in swimming pools.

Vogt RL, Hudson PJ, Orciari L, Heun EM, Woods TC. 1987. Legionnaires' disease and a whirlpool spa (Letter). *Ann Intern Med.* 107:596.

Wisconsin Administrative Code, Chapter ATCP 76. Safety, maintenance, and operation of public pools and water attractions.

14.7 Food Safety

Food and Drug Administration. 2013. Food code, recommendations of the United States Public Health Service.

Additional Chapter 7.0 Food Safety References

Mead PS, Slutsker L, Dietz V, McCaig LF, Bresee JS, Shapiro C, et al. 1999. Food-related illness and death in the United States. *Emerg Infect Dis.* 5(5).

Food and Drug Administration, Center for Food Safety and Applied Nutrition. 2012. Foodborne pathogenic microorganisms and natural toxins handbook: the “bad bug book.” 2nd edition.

Guzewich J, Ross MP. 1999. Evaluation of risks related to microbiological contamination of ready-to-eat food by food preparation workers and the effectiveness of interventions to minimize those risks. Food and Drug Administration.

Food and Drug Administration, Center for Food Safety and Applied Nutrition. 2000. CFP 2000 backgrounder: no bare hand contact.

Larson E, 1995. APIC guidelines for handwashing and hand antisepsis in healthcare settings. *Am J Infect Control.* 23:251–69.

NSF International. 1983. NSF C2-1983, Special equipment and/or devices (food service equipment). Ann Arbor, MI.

NSF International. 2015. ANSI/NSF 2-2015, Food equipment. Ann Arbor, MI.

NSF International. 2017. ANSI/NSF 3-2017, Commercial spray-type dishwashing and glasswashing machines. Ann Arbor, MI.

NSF International. 2016. ANSI/NSF 4-2016, Commercial cooking, rethermalization, and powered hot food holding and transport equipment. Ann Arbor, MI.

- NSF International. 2016. NSF 5-2016, Water heaters, hot water supply boilers, and heat recovery equipment. Ann Arbor, MI.
- NSF International. 2016. ANSI/NSF 6-2016, Dispensing freezers (for dairy dessert-type products). Ann Arbor, MI.
- NSF International. 2016. ANSI/NSF 7-2016, Commercial refrigerators and storage freezers. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 8-2017, Commercial powered food preparation equipment. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 12-2017, Automatic ice making equipment. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 13-2017, Refuse compactors and compactor systems. Ann Arbor, MI.
- NSF International. 2016. ANSI/NSF 18-2016, Manual food and BEVERAGE dispensing equipment. Ann Arbor, MI.
- NSF International. 2016. ANSI/NSF 20-2016, Commercial bulk milk dispensing equipment. Ann Arbor, MI.
- NSF International. 2015. ANSI/NSF 21-2015, Thermoplastic refuse containers. Ann Arbor, MI.
- NSF International. 2012. ANSI/NSF 25-2012, Vending machines for food and BEVERAGES. Ann Arbor, MI.
- NSF International. 1980. NSF 26-1980, Pot, pan, and utensil commercial spray-type washing machines. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 29-2017, Detergent and chemical feeders for commercial spray-type dishwashing machines. Ann Arbor, MI.
- NSF International. 2012. ANSI/NSF 35-2012, Laminated plastics for surfacing food service equipment. Ann Arbor, MI.
- NSF International. 2012. ANSI/NSF 36-2012, Dinnerware. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 37-2017, Air curtains for entranceways in food and food service establishments. Ann Arbor, MI.
- NSF International. 2014. ANSI/NSF 51-2014, Food equipment materials. Ann Arbor, MI.
- NSF International. 2017. ANSI/NSF 52-2017, Supplemental flooring. Ann Arbor, MI.
- NSF International. 2012. ANSI/NSF 59-2012, Mobile food carts. Ann Arbor, MI.
- Standard specification for factory assembled anodeless risers and transition fittings in polyethylene (PE) fuel gas distribution systems, ASTM Designation: F 1973-99.

14.8 Integrated Pest Management

- Armed Forces Pest Management Board. 1994. Technical Information Memorandum No.
29. Integrated pest management in and around buildings. Defense Pest Management Information Analysis Center. Washington, DC.

ASTM International. 2011. F1099M-98(2011), Standard Specification for Rat Guards, Ship's (Metric). West Conshohocken, PA.

Code of Federal Regulations, Title 40, Parts 152-186. Federal Insecticide, Fungicide, and Rodenticide Act.

D'Agnese JJ. 2008. Integrated pest management system guide for cruise ships. 7th edition. Cruise Ship Consultation Service, Fernandina Beach, FL.

Educational Foundation of the National Restaurant Association. 1992. Applied Foodservice Sanitation. 4th edition. John Wiley & Sons, New York.

National Restaurant Association. Pest management in restaurants. Washington, DC.

ServSafe. 1999. The educational foundation of the National Restaurant Association, Chicago, IL.

U.S. Army. 1996. Cockroach IPM: installation integrated pest management program for German cockroach control.

U.S. Navy. 1999. LT Christian's little blue book: an unofficial guide for US Navy shipboard medical officers.

U.S. Navy. 2009. Shipboard pest management pocket guide.

14.9 Housekeeping

APIC. 2002. Handbook of infection control. 3rd edition. Association for Professionals in Infection Control and Epidemiology. Mosby, St. Louis, MO.

Black JG. 1995. Microbiology: principles and application. 3rd edition. Prentice Hall, Upper Saddle River, NJ.

Block SS. 2001. Disinfection, sterilization & preservation. 5th edition. Williams & Wilkins, Philadelphia, PA.

Centers for Disease Control and Prevention. 1997. Final recommendations to minimize transmission of Legionnaires' disease from whirlpool spas on cruise ships.

Centers for Disease Control and Prevention. 2011. Guideline for the Prevention and Control of Norovirus Gastroenteritis Outbreaks in Healthcare Settings. Available from URL: <https://www.cdc.gov/infectioncontrol/guidelines/norovirus/index.html>.

Collins CH, ed. 1981. Disinfectants: their use and evaluation of effectiveness. Technical Series No 16. Society for Applied Bacteriology. Academic Press, San Diego, CA.

Freije MR, Barbaree JM, ed. 1996. Legionellae control in health care facilities: minimizing risk. HC Information Resources, Indianapolis, IN.

Marks PJ, Vipond IB, Carlisle D, Deakin D, Fey RE, Caul EO. 2000. Evidence for airborne transmission of Norwalk-like virus (NLV) in a hotel restaurant. *Epidemiol. Infect.* 124: 481-487.

Nester E, Nester M. 2015. Microbiology: a human perspective. 8th edition. McGraw Hill, New York, NY.

Robinson M. 1997. Housekeeping. Bantam Books, New York, NY.

Rutala RW. 1996. APIC guidelines for selection and use of disinfectants. *Am J Infect Control.* 24:13-42.

Tortora G. 2016. Microbiology: an introduction. 12th edition. Addison-Wesley, Reading, MA.

14.10 Child Activity Centers

American Academy of Pediatrics and American Public Health Association Staff. 1992. Caring for our children: national health & safety performance standards. Washington, DC.

National Resource Center for Health & Safety in Child Care, <http://nrckids.org/>.

Rutala RW. 1996. APIC guidelines for selection and use of disinfectants. Am J Infect Control. 24:13–42.

Young FE. 1989. In day-care centers, cleanliness is a must. FDA Consumer. U.S. Food and Drug Administration. Washington, DC.

14.11 HVAC Systems, Fountains, Misting Systems, Humidifiers, and Showers

ASHRAE. Guideline 12-2000, Minimizing the Risk of Legionellosis Associated with Building Water Systems.

ASHRAE. Guideline 180-2012, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems.

ASHRAE. Guidelines 188-2015, Legionellosis: Risk Management for Building Water Systems.

Bollin GE, Plouffe JF, Para MF, Hackman B. 1985. Aerosols containing “Legionella pneumophila” generated by shower heads and hot-water faucets. Appl Environ Microbiol. 50(5):1128–31.

Breiman R, Fields B, Volmer L, et al. 1989. Definitive association of shower use with Legionnaires’ disease: possible role of amoebae (Abstract). In: Program and abstracts of the 89th Annual Meeting of the American Society for Microbiology. American Society for Microbiology, Washington, DC; 126.

Freije MR. 1998. Minimizing the risk of Legionella in cooling towers and other HVAC equipment. HC Information Resources, Indianapolis, IN.

14.12 Administrative Guidelines

Centers for Disease Control and Prevention. 2001. Recommended shipbuilding construction guidelines for passenger vessels destined to call on U.S. ports.

Centers for Disease Control and Prevention, NCEH. 2011. Vessel Sanitation Program Construction Guidelines.

Centers for Disease Control and Prevention, NCEH. 2005. Vessel Sanitation Program Construction Guidelines.

Centers for Disease Control and Prevention. Summary of sanitation inspections of international cruise ships. www.cdc.gov/nceh/vsp.