Alaska Department of Environmental Conservation
Division of Water
Commercial Passenger Vessel Env Compliance Program

2016
Ocean Ranger Guidebook

2/4/2016

This guidebook is intended for use by Ocean Rangers, the Ocean Ranger contractor, and CPVEC staff. Copies are available on request but not intended for general distribution.
Please report any needed corrections to Ed White, CPVEC.

TABLE OF CONTENTS

REPORTING INFORMATION 1

SECTION 1 WASTEWATER 5

SUBSECTION 1: WASTEWATER RECORDS 10
SUBSECTION 2: GENERAL WASTEWATER AND EPA VGP 17
SUBSECTION 3: PERMITTED VESSELS 27
SUBSECTION 4: PERMITTED VESSELS DISCHARGING WHILE STATIONARY 34
SUBSECTION 5: NON DISCHARGING AND NO DISCHARGE AREAS 35

SECTION 2 SOLID WASTE 42

SUBSECTION 1: SOLID WASTE DAILY 44
SUBSECTION 2: GENERAL SOLID WASTE 47

SECTION 3 HAZARDOUS MATERIALS 51

SUBSECTION 1: HAZARDOUS MATERIALS AND WASTES DAILY 55
SUBSECTION 2: GENERAL HAZARDOUS MATERIALS AND WASTES 56

SECTION 4 AIR QUALITY 59

SUBSECTION 1: OPACITY AND AIR QUALITY 60

SECTION 5 SAFETY 70

SUBSECTION 1: SAFETY 70

SECTION 6 HEALTH, SANITATION 74

SUBSECTION 1: POTABLE WATER 74
SUBSECTION 2: SWIMMING POOL, SPA SANITATION 78

SECTION 7 OIL POLLUTION 80

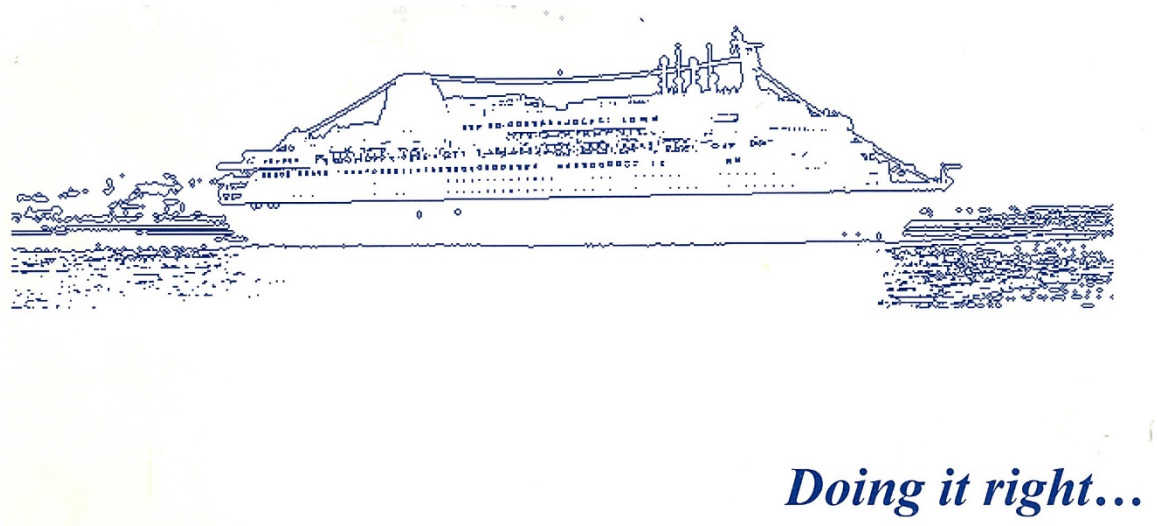
SUBSECTION 1: OIL POLLUTION, FUEL DAILY 91
SUBSECTION 2: OIL WATER SEPARATORS 92
SUBSECTION 3: BILGES 96
SUBSECTION 4: OIL SLUDGE HANDLING 98
SUBSECTION 5: BOATS AND DECK 99
SUBSECTION 6: OIL TO SEA INTERFACE 100

ONCE A SEASON REPORT 103

SECTION 1: WASTEWATER 103
SECTION 2: GENERAL WASTEWATER AND EPA VGP 108
SECTION 3: HAZARDOUS MATERIALS AND SOLID WASTE 112
SECTION 4: OIL AND FUEL 119
SECTION 5: AIR POLLUTION AND OPACITY 123
SECTION 5: SAFETY, HEALTH, SANITATION 126

ADDITIONAL INFORMATION 130

SECTION 1: WASTEWATER AWTS INFORMATION 130
SECTION 2: TERMS 139
SECTION 3: ABBREVIATIONS AND ACRONYMS 145
SECTION 4: ADDITIONAL WASTEWATER DEFINITIONS 146



Doing it right…

2001 CPVEC Logo

General Reporting Information:

Comprehensive and accurate reporting is critical to the success of the Ocean Ranger program. Concise, clear reporting is needed for all reports.

Please remember the potential readers of your report may have limited experience with cruise ships and marine engineering.

Information needed when documenting a noncompliant Item:

What? Give a concise to the point statement of what the noncompliance is. Information listed must be relevant and objective.

When? List time and date, and length of time if applicable.

Where? Give the location of the noncompliant item. It is difficult to find items with the size of the ships, and the fact that there can be more than one of something. For example, "on passenger deck" is not very precise, where "starboard side boat deck 10 feet aft of the #4 lifeboat davit" will help other Ocean Rangers find the item for follow-up if needed.

Why? Describe how the item is not in compliance. This should be comprehensive and clear.

Who? Describe who was notified on the ship, which outside agencies were contacted, and who reported the item. Document who you notified about the item.

Be sure to state if something was not personally observed, such as something reported to you by the vessel's crew.

What not to Report on daily Reports:

- Personal Information such as phone numbers, drivers license numbers.
- Not a cruise ship item. If something else, such as a fishing boat, report in the Oil Sheen report if oil related otherwise use a general report.
- Questions and suggestions. These should be in the general report.
- Not sure if it is a non-compliance item. Please report this on a general report for DEC to review.

Additional Observations:

DEC may request additional observations. There are two main types, compliance verification and cruise ship program information gathering. Compliance verification will be a follow up to a issue identified by an Ocean Ranger, sample results, DEC, or the US Coast Guard. Examples include documenting whether a non-compliance was corrected, or what procedural changes were made to

avoid a non compliance in the future. Information gathering could cover a wide range of topics. An example is wastewater treatment information for general permit development.

Additional observations have been very helpful to the DEC cruise ship program. Vessel operators may not realize the significance of documenting that a potential non-compliance item was fixed. Information gathered also saves operators time and effort when it is reported by an Ocean Ranger rather than DEC formally requesting documentation.

Once a season reports:

Please remember items on this can change. If you see a change please updated the once a season report with the updated information.

Photographs:

When including a photograph that supports an observation of interest, you will need to give a date, time, and location.

Here are some helpful hints for useful photographs:

- Take an "establishing" photograph showing the general location. This is helpful in showing the general location of the item.
- Take a "subject" photograph showing the item marked as critical.
- If possible place a ruler or object that will establish scale
- Lighting is not good in many locations, using a flash may help.
- If possible stand on equipment or floors that are not vibrating excessively.

Sketches and drawings:

Sketches and drawings can be very helpful for the reviewer. Remember that they are often in an office, and may not be familiar with the item or the ship.

Sharing of Information

Ocean Rangers are permitted to provide information such as reports and photos to ADEC, Crowley, and the US Coast Guard.

After providing any information to the USCG, the ranger should write in their daily report what information they provided, to whom, on what date.

Ocean Rangers should NOT directly provide copies of their reports or photos to anybody else. ALL OTHERS (cruise industry, public, etc.) should make a request for information to ADEC.

Information Section of the Job Aid (A)

1) **General Information**: Provide the requested information. The Job Aid contains instructions on what to enter. The vessel should have the number of passengers and crew onboard. This number may vary, provide what was listed at the time this was checked.
2) **Discharge in Alaska on report day? (Y/N)**
   Provide information at the time this item was completed.
3) **Sample Taken (Y/N)**
   Provide information if a wastewater sample was taken.
   A) Type- A compliance sample is a sample taken for the General Permit or USCG Continuous Compliance while discharging. Process sampling occurs onboard to check that the equipment is functioning, it does not have to follow the QAPP or GP requirements. Information sampling would be for example when taking a sample without discharging for USCG or EPA.
   B) Type of WW Sampled. Provide the type of wastewater that is being sampled- for example mixed for mixed graywater and blackwater. Receiving water is not wastewater but is taken in the mixing zone off the ship with mixed seawater and discharged wastewater.
   C) Sample ID- this is provided by the sampler. If no ID for example process sampling leave blank.
   D) Sample date, time, duration. Enter the date, approximate time sample began, and how long the sample took to complete. Provide notes in general comments if sample was delayed, taken at multiple times, or was not completed.
   E) Sample taken while discharging (Y/N). List if ship was discharging or not.
   F) Discharge continuous or intermittent. Provide information if the discharge was while the ship was continuously discharging or if it was intermittent- such as from a tank with a level control that automatically pumps out when a level is reached.
4) **Waste Offloads (Y/N)**
   Answer Y/N, then fill in the information requested. Check that offload matches waste offload plan.
5) **Reportable Illness**

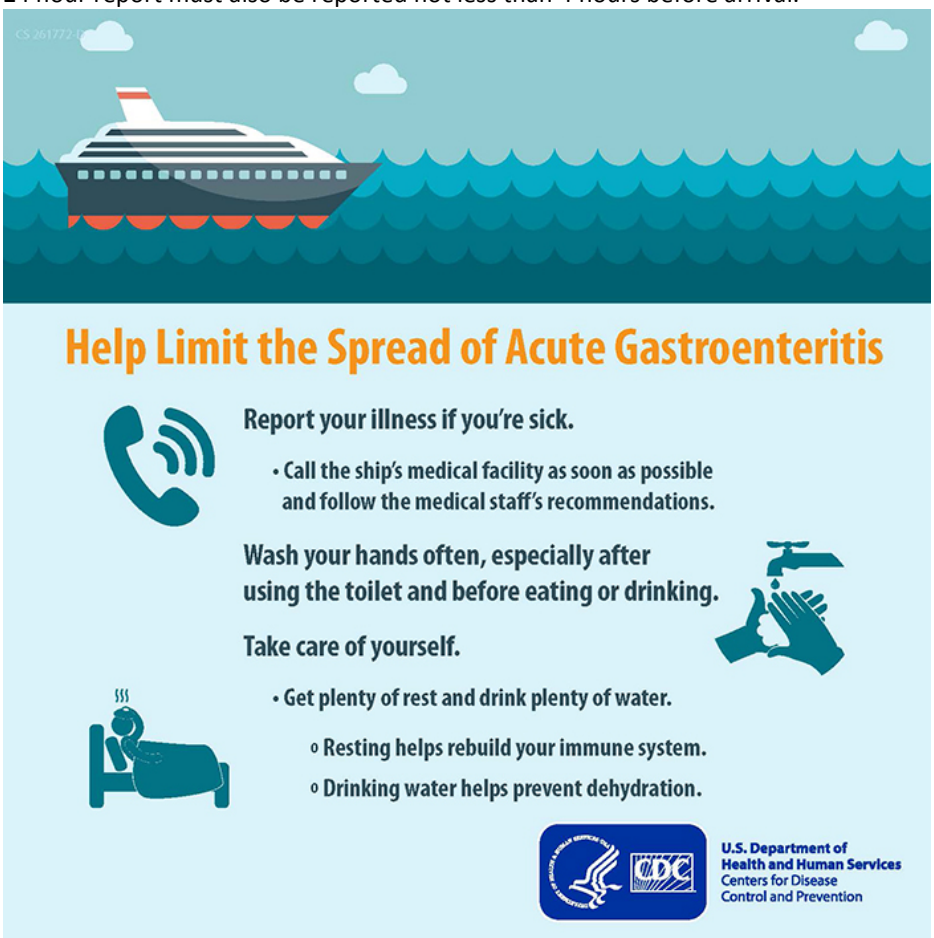
Report Y/N if the vessel is above the CDC reportable threshold. This is 2% of passengers or crew with GI illness, but this can change for example if there is a flu pandemic. Vessels must report to the

42 CFR §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).

(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.



6) General Comments and Photos

Provide information not captured elsewhere, such as items or information of interest, specific information to address comments in observations, and photos of interest.

Section 1: Wastewater

Background:

Large cruise ships can generate significant amounts of wastewater compared with other vessels because of the high number of crew and passengers. This wastewater can be highly concentrated due to water conservation efforts onboard. If this wastewater were released untreated near shore it would be a human health concern.

Cruise ship wastewater effluent quality is an issue of concern in Alaska since the 1990s. After public requests for information, sampling was performed indicating that cruise ship marine sanitation devices (MSD II) were not working as designed. Federal and state laws were passed in 2000 and 2001 regulating effluent limits for treated sewage and graywater in Alaska.

Cruise ships that discharge wastewater into marine waters of the state began to install Advanced Wastewater Treatment Systems (AWTS) in 2001 to meet federal and state wastewater requirements. Several types of AWTS were installed. By the end of the 2004 cruise ship season, sample results indicated substantial improvements in effluent quality for fecal coliform, biochemical oxygen demand, suspended solids, and chlorine. An exceedance of one of these parameters may be an indicator of improperly working equipment.

Not all cruise ships discharge in Alaskan waters. About half of all large cruise ships are permitted to discharge with the rest discharging outside of state or federal waters. Some vessels are permitted but only discharge under specific conditions, such as while underway, or only discharge limited volumes.

Wastewater is one of the primary reasons for the creation of the Ocean Ranger program passed by Alaska voters. You will be monitoring for items such as unpermitted discharges, exceedances of federal and state effluent limits, sampling that is representative of typical discharges, and gathering information that is of use to current and future ADEC wastewater permitting.

Regulatory background:

Federal legislation was enacted in 2000 (Title XIV--Certain Alaskan Cruise Ship Operations) regulating large cruise ship wastewater in Alaska (also known as the "Murkowski Law"), with regulations effective in 2001. Title XIV prohibited discharge of untreated sewage in Alaskan waters; including areas within the Alexander Archipelago in Southeast Alaska more than 3 miles from shore (donut holes). Treated sewage and graywater is required to meet minimum requirements if discharged while within 1 nautical mile or at speeds of less than 6 knots. Title XIV allowed the EPA to create minimum effluent quality regulations that would be consistent with State of Alaska water quality standards and allowed the State of Alaska to impose additional requirements and permitting.

The ADEC Commercial Passenger Vessel Environmental Compliance (CPVEC) Program was established in July 2001 by Alaska Statute (AS) 46.03.460 - AS 46.03.490. State law set effluent limits and sampling requirements for the discharge of blackwater and graywater from large commercial passenger vessels ("cruise ships"). Cruise ships that discharged treated sewage in Alaska are required to take samples of discharged wastewater. Effluent limits were established for Fecal Coliform (a type of bacteria) and solids.

In August 2006, Alaskan voters approved a ballot measure that added new requirements to the CPVEC Program. Among several other new provisions (such as Ocean Rangers), the statute

required owners/operators of large commercial passenger vessels to obtain a wastewater discharge permit from ADEC for the discharge of any treated sewage, treated graywater, or other treated wastewater into marine waters of the state. The new law required that cruise ship wastewater effluent meet Alaska Water Quality Standards (WQS) at the point of discharge.

House Bill (HB) 80 was passed by the Legislature in 2013. This bill allowed ADEC to issue a five year General Permit to cruise ships that contains effluent limits or standards that are less stringent than the WQS at the point of discharge if the Department allows a mixing zone. This has allowed the development of the 2014 General Permit for large cruise ships.

In 2008, the United States Environmental Protection Agency (EPA) issued a vessel general discharge permit (VGP). The VGP covers a range of discharge types (e.g. graywater, deck wash-down, ballast, boiler blow down, etc.) and management practices for a variety of vessels.

Some Differences between ADEC and USCG requirements for wastewater:

- State has a permit, USCG approves for continuous discharge
- USCG continuous- less than 6 knots and within 1nm, ADEC less than 6 knots only.
- USCG- 500 passengers plus, ADEC 50 passengers plus (250 for large)
- ADEC – sampling must be in Alaska and while discharging

General regulations:

AS 46.03.462 (a & b). Terms and conditions of discharge permits. (updated in 2013)

(a) An owner or operator may not discharge any treated sewage, graywater, or other wastewater from a commercial passenger vessel into the marine waters of the state unless the owner or operator

(1) obtains a permit under AS 46.03.100 , which shall comply with the terms and conditions of vessel discharge requirements specified in (b) of this section; or

(2) has a plan approved by the department under (c) of this section.

(b) The minimum standard terms and conditions for all discharge permits authorized under this section require that the owner or operator

(1) may not discharge untreated sewage, treated sewage, graywater, or other wastewaters in a manner that violates any applicable state or federal law governing the disposal or discharge of solid or liquid waste material;

(2) shall maintain records and provide the reports required under AS 46.03.465(a);

(3) shall collect and test samples as required under AS 46.03.465 (b) and (d) and provide the reports with respect to those samples required by AS 46.03.475 (c);

(4) shall report discharges in accordance with AS 46.03.475 (a);

(5) shall allow the department access to the vessel at the time samples are taken under AS 46.03.465 for purposes of taking the samples or for purposes of verifying the integrity of the sampling process; and

(6) shall submit records, notices, and reports to the department in accordance with AS 46.03.475 (b), (d), and (e).

AS. 46.03.463. Prohibited discharges; limitations on discharges.

(a) Except as provided in (h) of this section, a person may not discharge untreated sewage from a commercial passenger vessel into the marine waters of the state.

(b) Except as provided in (h) of this section or under AS 46.03.462(c), a person may not discharge sewage from a commercial passenger vessel into the marine waters of the state that has suspended solids greater than 150 milligrams per liter or a fecal coliform count greater than 200 colonies per 100 milliliters except that the department may by regulation adopt a protocol for retesting for fecal coliform, if this discharge limit for fecal coliform is exceeded, under which a discharger will be considered to be in compliance with the fecal coliform

limit if the geometric mean of fecal coliform count in the samples considered under the protocol does not exceed 200 colonies per 100 milliliters.

(c) Except as provided in (h) of this section or under AS 46.03.462(c), a person may not discharge graywater or other wastewater from a commercial passenger vessel into the marine waters of the state that has suspended solids greater than 150 milligrams per liter or a fecal coliform count greater than 200 colonies per 100 milliliters except that the department may by regulation adopt a protocol for retesting for fecal coliform, if this discharge limit for fecal coliform is exceeded, under which a discharger will be considered to be in compliance with the fecal coliform limit if the geometric mean of fecal coliform count in the samples considered under the protocol does not exceed 200 colonies per 100 milliliters.

(d) *[Repealed, Sec. 5, 2006 Primary Election Ballot Measure No. 2].*

(e) An owner or operator may not discharge any treated sewage, graywater, or other wastewater from a large commercial passenger vessel into the marine waters of the state unless the owner or operator obtains a permit under AS 46.03.100 and 46.03.462, and provided that the vessel is not in an area where the discharge of treated sewage, graywater, or other wastewaters is otherwise prohibited.

(f) Except as provided in (h) of this section, a person may not discharge sewage from a small commercial passenger vessel unless the sewage has been processed through a properly operated and properly maintained marine sanitation device.

(g) *[Repealed, Sec. 5, 2006 Primary Election Ballot Measure No. 2].*

(h) The provisions of (a) - (f) of this section do not apply to discharges made for the purpose of securing the safety of the commercial passenger vessel or saving life at sea if all reasonable precautions have been taken for the purpose of preventing or minimizing the discharge.

AS 46.03.465. Information-gathering requirements.

(a) The owner or operator of a commercial passenger vessel shall maintain daily records related to the period of operation while in the state, detailing the dates, times, and locations, and the volumes and flow rates of any discharges of sewage, graywater, or other wastewaters into the marine waters of the state, and provide electronic copies of those records on a monthly basis to the department not later than five days after each calendar month of operation in state waters.

(b) While a commercial passenger vessel is present in the marine waters of the state, the owner or operator of the vessel shall provide an hourly report of the vessel's location based on Global Positioning System technology and collect routine samples of the vessel's treated sewage, graywater, and other wastewaters being discharged into marine waters of the state with a sampling technique approved by the department.

(c) While a commercial passenger vessel is present in the marine waters of the state, the department, or an independent contractor retained by the department, may collect additional samples of the vessel's treated sewage, graywater, and other wastewaters being discharged into the marine waters of the state.

(d) The owner or operator of a vessel required to collect samples under (b) of this section shall ensure that all sampling techniques and frequency of sampling events are approved by the department in a manner sufficient to ensure demonstration of compliance with all discharge requirements under AS 46.03.462.

(e) The owner or operator of a commercial passenger vessel shall pay for all reporting, sampling, and testing of samples under this section.

(f) If the owner or operator of a commercial passenger vessel has, when complying with another state or federal law that requires substantially equivalent information gathering, gathered the information required under (a), (b), or (d) of this section, the owner or operator shall be considered to be in compliance with that subsection so long as the information is also provided to the department.

AS 46.03.490. Definitions. (abridged)

(3) "discharge" means any release, however caused, from a commercial passenger vessel, and includes any escape, disposal, spilling, leaking, pumping, emitting, or emptying;
(6) "graywater" means galley, dishwasher, bath, and laundry waste water;
(8) "marine waters of the state" means all waters within the boundaries of the state together with all of the waters of the Alexander Archipelago even if not within the boundaries of the state;
(10) "other wastewater" means graywater or sewage that is stored in or transferred to a ballast tank or other holding area on the vessel that may not be customarily used for storing graywater or sewage;
(12) "sewage" means human body wastes and the wastes from toilets and other receptacles intended to receive or retain human body waste;
(14) "treated sewage" means sewage that meets all applicable effluent limitation standards and processing requirements of 33 U.S.C. 1251 - 1376 (Federal Water Pollution Control Act), as amended, the federal cruise ship legislation, and regulations adopted under 33 U.S.C. 1251 - 1376 or under the federal cruise ship legislation;
(15) "untreated sewage" means sewage that is not treated sewage;

Federal Regulations (33 CFR 159)

33 CFR 159.307 Untreated sewage.

No person shall discharge any untreated sewage from a cruise vessel into the applicable waters of Alaska.

33 CFR 159.309 Limitations on discharge of treated sewage or graywater.

(a) No person shall discharge treated sewage or graywater from a cruise vessel into the applicable waters of Alaska unless:

(1) The cruise vessel is underway and proceeding at a speed of not less than six knots;
(2) The cruise vessel is not less than one nautical mile from the nearest shore, except in areas designated by the Coast Guard in consultation with the State of Alaska;
(3) The discharge complies with all applicable cruise vessel effluent standards established pursuant to Pub. L. 106–554 and any other applicable law, and
(4) The cruise vessel is not in an area where the discharge of treated sewage or graywater is prohibited.

(b) Until such time as the Administrator promulgates regulations addressing effluent quality standards for cruise vessels operating in the applicable waters of Alaska, treated sewage and graywater may be discharged from vessels in circumstances otherwise prohibited under paragraph (a)(1) and (2) of this section provided that:

(1) Notification to the Captain of the Port (COTP) is made not less than 30 days prior to the planned discharge, and such notice includes results of tests showing compliance with this section;
(2) The discharge satisfies the minimum level of effluent quality specified in 40 CFR 133.102;
(3) The geometric mean of the samples from the discharge during any 30-day period does not exceed 20 fecal coliform/100 milliliters (ml) and not more than 10 percent of the samples exceed 40 fecal coliform/100 ml;
(4) Concentrations of total residual chlorine do not exceed 10.0 micrograms per liter (µgm/l);
(5) Prior to any such discharge occurring, the owner, operator or master, or other person in charge of a cruise vessel, can demonstrate to the COTP that test results from at least five samples taken from the vessel representative of the effluent to be discharged, on different days over a 30-day period, conducted in accordance with the guidelines promulgated by the Administrator in 40 CFR part 136, which confirm that the water quality of the effluents proposed for discharge is in compliance with paragraphs (b)(2), (3) and (4) of this section; and
(6) To the extent not otherwise being done by the owner, operator, master or other person in charge of a cruise vessel, pursuant to §159.317 of this subpart, the owner, operator, master or other person in charge of a cruise vessel shall demonstrate continued compliance through sampling and testing for conventional pollutants and residual chlorine of all treated sewage and graywater effluents periodically as determined by the COTP.

33 CFR 159.315 Sewage and graywater discharge record book.

(See Item 1.1.a)

33 CFR 159.317 Sampling and reporting.

(a) The owner, operator, master or other person in charge of a cruise vessel that discharges treated sewage and/or graywater in the applicable waters of Alaska shall;

(1) Not less than 90 days prior to each vessel's initial entry into the applicable waters of Alaska during any calendar year, provide to the COTP certification of participation under a Quality Assurance/Quality Control Plan (QA/QCP) accepted by the COTP for sampling and analysis of treated sewage and/or graywater for the current operating season;

(2) Not less than 30 days nor more than 120 days prior to each vessel's initial entry into the applicable waters of Alaska during any calendar year, provide a certification to the COTP that the vessel's treated sewage and graywater effluents meet the minimum standards established by the Administrator, or in the absence of such standards, meet the minimum established in §159.319 of this subpart;

(3) Within 30 days of each vessel's initial entry into the applicable waters of Alaska during any calendar year, provide to the COTP a Vessel Specific Sampling Plan (VSSP) for review and acceptance, and undergo sampling and testing for conventional pollutants of all treated sewage and graywater effluents as directed by the COTP;

(4) While operating in the applicable waters of Alaska be subject to unannounced sampling of treated sewage and graywater discharge effluents, or combined treated sewage/graywater discharge effluents for the purpose of testing for a limited suite, as determined by the Coast Guard, of priority pollutants;

(5) While operating in the applicable waters of Alaska be subject to additional random sampling events, in addition to all other required sampling, of some or all treated sewage and graywater discharge effluents for conventional and/or priority pollutant testing as directed by the COTP;

(6) Ensure all samples, as required by this section, are collected and tested by a laboratory accepted by the Coast Guard for the testing of conventional and priority pollutants, as defined by this subpart, and in accordance with the cruise vessel's Coast Guard accepted QA/QCP and VSSP;

(7) Pay all costs associated with development of an acceptable QA/QCP and VSSP, sampling and testing of effluents, reporting of results, and any additional environmental record keeping as required by this subpart, not to include cost of federal regulatory oversight.

(b) A QA/QCP must, at a minimum include:

(1) Sampling techniques and equipment, sampling preservation methods and holding times, and transportation protocols, including chain of custody;

(2) Laboratory analytical information including methods used, calibration, detection limits, and the laboratory's internal QA/QC procedures;

(3) Quality assurance audits used to determine the effectiveness of the QA program; and

(4) Procedures and deliverables for data validation used to assess data precision and accuracy, the representative nature of the samples drawn, comparability, and completeness of measure parameters.

(c) A VSSP is a working document used during the sampling events required under this section and must, at a minimum, include:

(1) Vessel name;

(2) Passenger and crew capacity of the vessel;

(3) Daily water use of the vessel;

(4) Holding tank capacities for treated sewage and graywater;

(5) Vessel schematic of discharge ports and corresponding sampling ports;

(6) Description of discharges; and

(7) A table documenting the type of discharge, type of sample drawn (grab or composite), parameters to test for (conventional or priority pollutants), vessel location when sample drawn, date and time of the sampling event.

(d) Test results for conventional pollutants shall be submitted within 15 calendar days of the date the sample was collected, and for priority pollutants within 30 calendar days of the date the sample was collected, to the COTP directly by the laboratory conducting the testing and in accordance with the Coast Guard accepted QA/QCP.

(e) Samples collected for analysis under this subpart shall be held by the laboratory contracted to do the analysis for not less than six months, or as directed by the COTP.

(f) Reports required under this section may be written or electronic. If electronic, the reports must be in a format readable by Coast Guard and Alaska Department of Environmental Conservation data systems.

33 CFR159.319 Fecal coliform and total suspended solids standards.

(a) *Treated sewage effluent discharges.* Until such time as the Administrator promulgates effluent discharge standards for treated sewage, treated sewage effluent discharges in the applicable waters of Alaska shall not have a fecal coliform bacterial count of greater than 200 per 100 ml nor total suspended solids greater than 150 mg/l.

(b) *Graywater effluent discharges.* [Reserved]

State Regulations and General Permit:
See the individual Job Aid Item number and the Electronic Copy of the General Permit.

Subsection 1: Wastewater Records- Daily Observations (if applicable)

Job Aid Item: 1.1.a

Text: Daily waste water and related discharge logs are current, monitored and recorded IAW 18 AAC 69.050 & 33 CFR 159.315

Background: Cruise Ships in Alaska are required to maintain a Sewage and Graywater Discharge Record book (discharge log) onboard that documents when, where, how much, at what speed, and what type of wastewater was discharged in Alaskan waters and waters of the Alexander Archipelago (Southeast Alaska). State regulations only require a book for vessels discharging in Alaskan waters, but federal regulations require all vessels to carry a record book (only over 500 passengers).

AS 46.03.465 (a): *The owner or operator of a commercial passenger vessel shall maintain daily records related to the period of operation while in the state, detailing the dates, times, and locations, and the volumes and flow rates of any discharges of sewage, graywater, or other wastewaters into the marine waters of the state, and provide electronic copies of those records on a monthly basis to the department not later than five days after each calendar month of operation in state waters.*

Wastewater discharge logs are critical in determining what is being discharged and where. They could be used for compliance checks and future permitting decisions. These logs must be accurate, complete, and filled out in a timely manner. Although the logs are also checked by ADEC staff and the USCG, being onboard allows time sensitive checks and verification while a vessel is underway.

Errors have been discovered in discharge logs. Locations, times, and dates have been transcribed incorrectly. Discharge ports and effluent types have been incorrectly listed. Volumes are often estimated and sometimes do not match what would be expected for a normal volume. Discharge logs have also documented discharges of wastewater in unpermitted areas.

It is recommended that the Ocean Ranger is familiar with the discharge logs and any discharge record book instructions onboard each cruise ship. There is a wide variety of discharge logs used. A good discharge log will include a detailed instruction sheet, clear entries, and page numbering, although these items are not required. Figure 1 is an example of an instruction sheet often included in or with the record book. Figures 2 and 3 are examples of discharge record book pages with signatures are ship names removed. The completed seasonal checklist will have information on who is responsible for the discharge logs, and where and how the records are kept.

What to check:

Check	Requirement	Citations
All Entries	All discharges of treated or untreated wastewater are recorded.	18 AAC 69.050(a)
All Entries	Entries are accurate (check location, type, times, dates)	18 AAC 69.050(b)
All Entries	Entries are legible and complete.	33 CFR 159.315(a)
All Entries	Discharge logs are recorded "without delay"	33 CFR 159.315(e)
All Entries	Volumes and flow rates are accurate	33 CFR 159.315(c)
All Entries	Discharge ports match VSSP	18 AAC 69.030(b)
All Entries	Signed daily by master or designated person	33 CFR 159.315 (e)
Logbook	Kept onboard and available (all cruise ships over 500 passengers, discharging over 250 passengers)	33 CFR 159.315(a), 18 AAC 69.050(a)
Logbook	Emergency or accidental discharge is recorded and reported.	33 CFR 159.315(d) & GP 1.8 & GP 2.4
Logbook	Vessel Name and Official Number on each page	33 CFR 159.315(a)
Logbook	Pages are not filled in in advance or pre-signed	33 CFR 159.315(b)

Note- there may be multiple citations for each requirement. The most relevant is listed above.

Please note there are other job aid items that are related to discharge logs for discharging vessels. In particular 1.1.d- checks for unpermitted discharge should include reviewing all discharge entries.

Citations: 33 CFR 159.315 Sewage and graywater discharge record book.

(a) While operating in the applicable waters of Alaska each cruise vessel shall maintain, in English, a legible Sewage and Graywater Discharge Record Book with the vessel's name and official number listed on the front cover and at the top of each page.

(b) Entries shall be made in the Sewage and Graywater Discharge Record Book whenever any of the following is released into the applicable waters of Alaska:

(1) Treated or untreated sewage;

(2) Graywater; or

(3) Sewage and graywater mixture.

(c) Each entry in the Sewage and Graywater Discharge Record Book shall, at a minimum, contain the following information:

(1) Name and location of each discharge port within the ship;

(2) Date the start of discharge occurred;

(3) Whether the effluent is treated or untreated sewage, graywater, or a sewage and graywater mixture and type of treatment used;

(4) Time discharge port is opened;

(5) Vessel's latitude and longitude at the time the discharge port is opened;

(6) Volume discharged in cubic meters;

(7) Flow rate of discharge in liters per minute;

(8) Time discharge port is secured;

(9) Vessel's latitude and longitude at the time the discharge port is secured; and

(10) Vessel's minimum speed during discharge.

(d) In the event of an emergency, accidental or other exceptional discharge of sewage or graywater, a statement shall be made in the Sewage and Graywater Discharge Record Book of the circumstances and reasons for the discharge and an immediate notification of the discharge shall be made to the COTP.

(e) Each entry of a discharge shall be recorded without delay and signed and dated by the person or persons in charge of the discharge concerned and each completed page shall be signed and dated by the master or other person having charge of the ship.

(f) The Sewage and Graywater Discharge Record Book shall be kept in such a place as to be readily available for inspection at all reasonable times and shall be kept on board the ship.

(g) The master or other person having charge of a ship required to keep a Sewage and Graywater Discharge Record Book shall be responsible for the maintenance of such record.

(h) The Sewage and Graywater Discharge Record Book shall be maintained on board for not less than three years.

18 AAC 69.050. Treated sewage, graywater, and other wastewater discharge records and report.

(a) An owner or operator shall maintain records required by AS 46.03.465(a) on board the vessel for 12 months, detailing each discharge of treated sewage, graywater, or other wastewater into the marine waters of the state.

(b) For an intermittent discharge of treated sewage, graywater, or other wastewater into the marine waters of the state, the records required by AS 46.03.465(a) must include the

(1) date, time, latitude, and longitude when and where the discharge started and ended;

(2) overboard discharge port through which the discharge occurred;

(3) type of discharge;

(4) volume and average discharge rate for each overboard discharge port;

(5) minimum vessel speed during discharge; and

(6) signature of the individual in charge of discharge operations and the date when that individual signed the discharge record.

(c) For an automatic or continuous discharge, in port, at anchorage, or underway, of treated sewage, graywater, or other wastewater into the marine waters of the state, the records required by AS 46.03.465(a) must describe for each voyage

(1) the daily estimated volume of discharge by type;

(2) a description of how the daily volume by discharge type was estimated;

(3) for each stay that a vessel makes at an anchorage or dock, the

(A) date of the stay;

(B) time expressed in a 24-hour clock format at the beginning and end of each docking or anchorage;

(C) latitude and longitude of the stay; and

(D) estimated average flow rate of discharge by type of discharge; and

(4) for each vessel route while the vessel is underway between each stay identified in (3) of this subsection, the

(A) dates while en route;

(B) time expressed in a 24-hour clock format at the beginning and end of each vessel route;

(C) vessel's average speed; and

(D) estimated average flow rate of discharge by type of discharge.

(d) Within 21 days after receipt of a written or electronic request from the department, an owner or operator shall submit copies of the requested treated sewage, graywater, or other wastewater records, or a report in a format requested by the department.

TSO ECR.1.20 Sewage and Greywater Discharge Record Book Instructions — Revised February 2007

Instructions:

When making entries into the Sewage & Greywater Discharge Book, each entry should be made as described below.

DAY	START TIME	START LAT	START LONG	DISCH PT(s)	EFF TYPE	FLOW (L/MIN)	P-I-C SIGN	DAY	STOP TIME	STOP LAT	STOP LONG	VOL (M/T)	MIN SPD(Kt)	P-I-C SIGN	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)

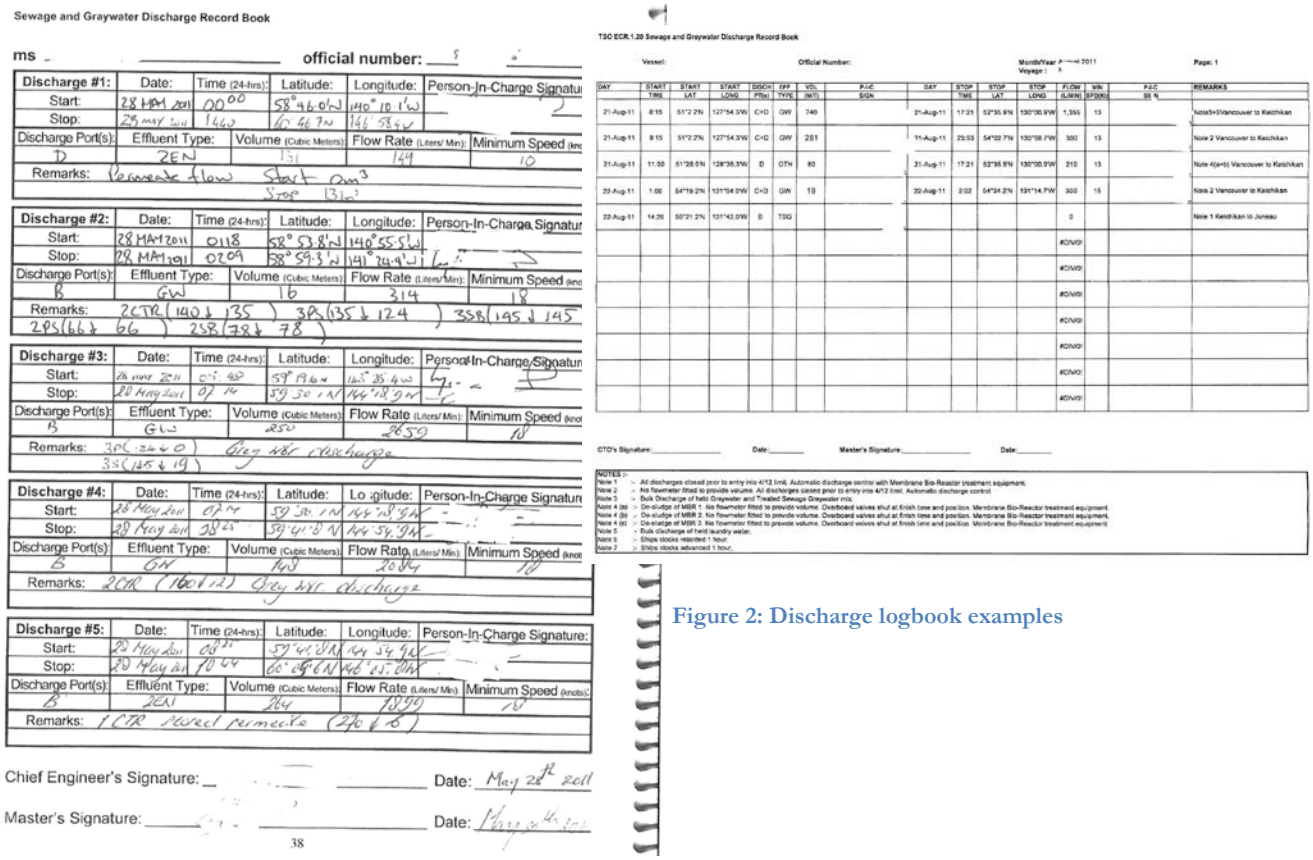
(1) Enter the day of the month the discharge started.
(2) Enter the local time the discharge started using 24-hr clock.
(3) Enter the latitude where the discharge started.
(4) Enter the longitude where the discharge started.
(5) Enter the discharge ports that were activated during the discharge. Each discharge port may be identified by code from the schematic below.
(6) Enter the effluent type discharged from the following codes.
US = Untreated Sewage
TS = Treated Sewage
GW = Greywater
USG = Untreated Sewage and Greywater mix
TSG = Treated Sewage and Greywater mix
OTH = Other (includes desludging operations). This must be explained in the remarks section (16).
(7) Enter the average discharge flow rate in liters per minute for the discharge period.
(8) Enter the signature of the person in charge of starting the discharge operations.
(9) Enter the day of the month the discharge stopped.
(10) Enter the local time the discharge stopped using 24-hr clock.
(11) Enter the latitude where the discharge stopped.
(12) Enter the longitude where the discharge stopped.
(13) Enter the volume in cubic meters of effluent discharged during the discharge period.
(14) Enter the vessel's minimum speed in knots during the discharge period.
(15) Enter the signature of the person in charge of stopping the discharge operations.
(16) Enter any remarks as needed to clarify the circumstances of the discharge such as; if the discharge controls were set to automatic during the period, if the discharge was an emergency, if the discharge was accidental etc. If additional space is needed, you may continue the entry in on the blank sheets in the back of this book. **Note treatment technology or equipment type (if used). Examples include biological MSD, reverse osmosis, ultrafiltration.**

ii

Sewage and Greywater Discharge Record Book for Cruise Ships

Figure 1: Discharge log information sheet

WW Discharge Logbook Instructions Example



Sewage and Graywater Discharge Record Book

ms official number:

Discharge #1:	Date:	Time (24-hrs):	Latitude:	Longitude:	Person-In-Charge Signatu
Start:	28 MAY 2011	0000	58°46.0'N	140°10.1'W	
Stop:	28 may 2011	1460	60 46 7N	146 58 4W	

Discharge Port(s):	Effluent Type:	Volume (Cubic Meters):	Flow Rate (Liters/ Min):	Minimum Speed (kno
D	2EN	131	149	10

Remarks: Permeate flow Start 0m3 Stop 131m3

Discharge #2:	Date:	Time (24-hrs):	Latitude:	Longitude:	Person-In-Charge Signatur
Start:	28 MAY 2011	0118	58° 53.8'N	140° 55.5'W	
Stop:	28 MAY 2011	0209	58° 59.3'N	141° 24.9'W	

Discharge Port(s):	Effluent Type:	Volume (Cubic Meters):	Flow Rate (Liters/Min):	Minimum Speed (kno
B	GW	16	314	18

Remarks: 2CTR (140↓135) 3SB (135↓124) 3SB (195↓145) 2BS (66↓66) 2SB (78↓78)

Discharge #3:	Date:	Time (24-hrs):	Latitude:	Longitude:	Person-In-Charge Signatur
Start:	28 MAY 2011	0[illegible]	59° 19.6 N	145° 35.4 W	
Stop:	28 May 2011	07 16	59 30 1 N	144°18.9 N	

Discharge Port(s):	Effluent Type:	Volume (Cubic Meters):	Flow Rate (Liters/ Min):	Minimum Speed (knot
B	GW	250	2850	18

Remarks: 3P (244 0) Grey Wtr discharge 3S (145↓19)

Discharge #4:	Date:	Time (24-hrs):	Latitude:	Lo :gitude:	Person-In-Charge Signatur
Start:	28 May 2011	07 14	59 30 1 N	144 18 9W	
Stop:	28 May 2011	08 25	59 41.8 N	144 54.9W	

Discharge Port(s):	Effluent Type:	Volume (Cubic Meters):	Flow Rate (Liters/ Min):	Minimum Speed (knot
B	GW	149	2094	18

Remarks: 2CR (160↓12) Grey Wtr discharge

Discharge #5:	Date:	Time (24-hrs):	Latitude:	Longitude:	Person-In-Charge Signature:
Start:	28 May 2011	08 21	59 41.8 N	144 54.9W	
Stop:	28 May 2011	10 44	60° 06.6 N	146° 23.0W	

Discharge Port(s):	Effluent Type:	Volume (Cubic Meters):	Flow Rate (Liters/ Min):	Minimum Speed (knots):
B	2EN	264	1870	18

Remarks: 1CTR Mixed permeate (240↓8)

Chief Engineer's Signature: Date: May 28th 2011

Master's Signature: Date: May 28th 2011

38

TSO ECR.1.20 Sewage and Greywater Discharge Record Book

Vessel: Official Number: Month/Year 2011 Voyage: Page: 1

DAY	START TIME	START LAT	START LONG	DISCH Pt(s)	EFF TYPE	VOL (M³)	P-I-C SIGN	DAY	STOP TIME	STOP LAT	STOP LONG	FLOW (L/MIN)	MIN SPD(Kt)	P-I-C SIG N	REMARKS
21-Aug-11	8:15	51°2.2'N	127°54.3'W	C+D	GW	740		21-Aug-11	17:21	52°35.9'N	130°00.9'W	1,355	13		Note3+5Vancouver to Ketchikan
21-Aug-11	8:15	51°2.2'N	127°54.3'W	C+D	GW	281		21-Aug-11	23:53	54°02.7'N	130°58.7'W	300	13		Note 2 Vancouver to Ketchikan
21-Aug-11	11:00	51°26.0'N	128°36.3'W	B	OTH	80		21-Aug-11	17:21	52°35.9'N	130°00.9'W	210	13		Note 4(a+b) Vancouver to Ketchikan
22-Aug-11	1:00	54°19.2'N	131°54.0'W	C+D	GW	19		22-Aug-11	2:02	54°34.2'N	131°14.7'W	300	15		Note 2 Vancouver to Ketchikan
22-Aug-11	14:26	55°21.2'N	131°42.0'W	B	TSG							0			Note 1 Ketchikan to Juneau
												#DIV/0!			
												#DIV/0!			
												#DIV/0!			
												#DIV/0!			
												#DIV/0!			
												#DIV/0!			
												#DIV/0!			

CTO's Signature: Date: Master's Signature: Date:

NOTES :-
Note 1 :- All discharges closed prior to entry into 4/12 limit. Automatic discharge control with Membrane Bio-Reactor treatment equipment.
Note 2 :- No flowmeter fitted to provide volume. All discharges ceased prior to entry into 4/12 limit. Automatic discharge control.
Note 3 :- Bulk Discharge of twin Greywater and Treated Sewage Greywater mix.
Note 4 (a) :- De-sludge of MBR 1. No flowmeter fitted to provide volume. Overboard valves shut at finish time and position. Membrane Bio-Reactor treatment equipment.
Note 4 (b) :- De-sludge of MBR 3. No flowmeter fitted to provide volume. Overboard valves shut at finish time and position. Membrane Bio-Reactor treatment equipment.
Note 4 (c) :- De-sludge of MBR 3. No flowmeter fitted to provide volume. Overboard valves shut at finish time and position. Membrane Bio-Reactor treatment equipment.
Note 5 :- Bulk discharge of twin laundry water.
Note 6 :- Ships clocks retarded 1 hour.
Note 7 :- Ships clocks advanced 1 hour.

Figure 2: Discharge logbook examples

Job Aid Item: 1.1.b

Text: Discharge logs type and volumes match other available information

What to check for: This item replaces information section gathering. Please check if discahreg logs match other available sources of information, such as meters, logging of tank volumes, and production information.

Figure 3- GW offload hose in Juneau

Job Aid Item: 1.1.c

Text: Waste water to shore (such as a sewer system or trucks) discharges are not released into regulated water body IAW AS 46.03.462

Background: Some cruise ships discharge treated or untreated wastewater to shore for disposal. Most of this occurs at the Franklin Dock in Juneau where graywater is offloaded to the Juneau sewer system. It is also possible that wastewater could be offloaded into trucks or to other municipal wastewater

Figure 5- GW offload hose in Juneau

Figure 4- Sewage offload by tank vacuum truck

treatment systems.

What to check: Wastewater must be offloaded without spills or direct discharge to water bodies. Hoses must not leak, docks or shore must not have pools of wastewater, check for unusual foam or smell in seawater near the offload operations.

Citations: AS 46.03.462 (obtaining and complying with a permit), AS 46.03.463 (no untreated discharge).

Job Aid Item: 1.1.d

Text: Check for unpermitted discharges of untreated wastewater, treated wastewater by unpermitted vessels, discharge in areas closed to discharge, or discharge of sludge or biosolids in Alaska waters IAW AS 46.03.462 and GP

Figure 6: Unknown Discharge

Background: Cruise ships in Alaska are required to only discharge treated wastewater in Alaskan waters and the Alexander Archipelago (AS 46.03.462&463, 33CFR 159.307&309). Discharge of untreated wastewater in these areas is prohibited. Wastewater that is discharged must meet all federal and state requirements for treatment and can only be discharged where permitted. Wastewater discharge in Alaskan waters requires a state permit (Large Commercial Passenger Vessel Wastewater Discharge General Permit).

Title XIV (the "Murkowski law") allowed the state of Alaska to regulate wastewater discharge for large cruise ships within Alaskan waters and also within some areas in the Alexander Archipelago that are outside of 3 nautical miles (nm) but within US territorial waters. This closed the "doughnut holes" located in the Inside passage in Southeast Alaska. The boundaries are included in the General Permit and the reference GP Map in this Guidebook.

Please check the latest version of the general permit for information on discharge limitations. The General Permit also prohibits discharge to impaired or water quality limited waters.

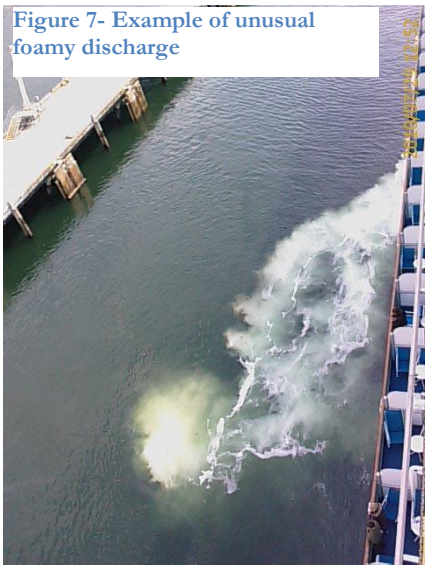


Figure 7- Example of unusual foamy discharge

The General Permit also has limitations on the type of discharges. Discharges must be from an Advanced Wastewater Treatment System and cannot contain oily sheens, large amounts of foam, floating solids, garbage, grease, or sediments and sludge that does not meet the standards required for wastewater discharge (GP1.3).

A frequent question is discharge in the waters of Tracy Arm. Discharge restrictions for Tracy Arm are by a voluntary agreement only. There is no regulatory prohibition on discharge of treated wastewater in Tracy Arm.

About 5-10 percent of the treated WW volume is "bio sludge" / "biosolids" these solids are kept in holding tanks, although

some vessels dry this sludge and incinerate. The sludge could also be discharged outside 12 nm. Some vessels have cleaned out the biosludge manually from the AWTS system tanks and system. The sludge and solids can be stored in drums or large garbage cans for later disposal. Such operations should be reported and documented.

What to check: Check discharge logs for any entries documenting accidental or emergency discharges. Check discharge log entries for locations of discharge that show unpermitted WW discharge. Check that listed discharge amounts did not exceed the design capacity of the treatment plant. Check overboard ports are closed on non-discharging vessels in Alaskan waters, and on discharging vessels in those areas they cannot discharge. Monitor for unusual activities. Watch for foam, solids, oily sheens, unusual smells in the waters around the cruise ship.

Citations: AS 46.03.462 (a-c) Terms and conditions of discharge permits, AS 462.463 (a&e) Prohibited discharges; limitations on discharges.

General Permit: See 2014 GP for applicable limitations

33 CFR 159.307

No person shall discharge any untreated sewage from a cruise vessel into the applicable waters of Alaska.

33 CFR 159.309 (a)

(a) No person shall discharge treated sewage or graywater from a cruise vessel into the applicable waters of Alaska unless:

(1) The cruise vessel is underway and proceeding at a speed of not less than six knots;

(2) The cruise vessel is not less than one nautical mile from the nearest shore, except in areas designated by the Coast Guard in consultation with the State of Alaska;

(3) The discharge complies with all applicable cruise vessel effluent standards established pursuant to Pub. L. 106–554 and any other applicable law, and

(4) The cruise vessel is not in an area where the discharge of treated sewage or graywater is prohibited.

Figure 8- BW stored in garbage cans from overflow

Maps/References:

Figure 10 outlines where the Alaska Large Commercial Passenger Vessel Wastewater General Permit applies in Southeeast Alaska. All areas inside of the blue 3 nautical mile boundaries and all areas inside of the red boundaries are covered by the General Permit. The 3nm boundaries in blue inside of the red lines are known as "doughnut holes" and were closed to discharge of untreated sewage by Title XIV. The blue boundaries still apply for all items other than wastewater as the boundaries of state territorial waters.

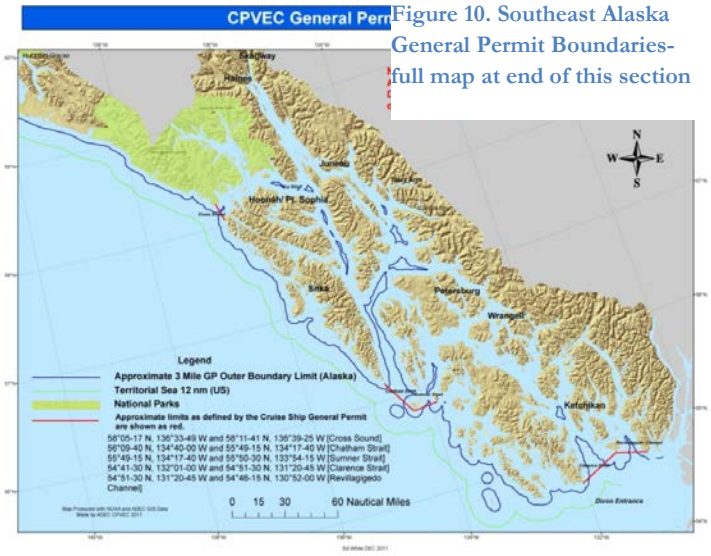


Figure 10. Southeast Alaska General Permit Boundaries- full map at end of this section

There can be a large difference between what can be discharged and what actually is. For many cruise ship operators, company policy is more stringent than what is required by federal and state

regulations. For example, some ships treat all sewage even outside of 12 nautical miles. Some operators voluntarily hold treated wastewater in areas such as Tracy Arm.

Table 1: Sewage and Graywater Discharges (Large Cruise Ships)

What?	Stationary [1]	Continuous[2]	Title XIV AK Waters[3]	Outside 12 nm[4]
Treated Wastewater	AK GP	USCG Approval	AK GP	Yes
Untreated Wastewater	No	No	No	Yes[5]
Sludge/Biosolids	No	No	No	Yes

Table 2: Other Wastewaters (Large Cruise Ships)

(note wastewater could be comingled)

What?	Within 3 nm	Outside 3 nm	Outside 12 nm[6]
Pool/spa water	De-chlorinate, de-brominate	Yes	Yes
Boiler water	No[7]	Yes	Yes
Ballast water[8]	Varies	Varies	Varies
Hazardous Waste	No	No	No
Oily water[9]	No	No	No

Table 3: Solid Wastes

What?	Within 3 nm	Outside 3 nm[10]	Outside 12 nm[11]
Food wastes	No	Yes if ground	Yes
Paper, glass, metal, rags, refuse	No	Yes if ground or communited	Yes
Packing Materials that float (not plastics)	No	No	Yes outside 25 nm
Plastics	No	No	No

[1] Stationary in the Alaska 2010 Wastewater General Permit is defined as less than 6 knots speed.
[2] Continuous discharge is within 1 nautical mile from nearest shore or less than 6 knots speed.
[3] For wastewater from large cruise ships, includes the whole of the Alexander Archipelago in Alaska and within 3 nm from shore as defined in 33 CFR 159.305
[4] Outside United States Territorial Seas
[5] Needs to be discharged underway and at a moderate rate of discharge if stored in holding tanks.
[6] Outside United States Territorial Seas
[7] Unless conditions in the EPA VGP are met.
[8] Requirements of EPA VGP must be met, see EPA VGP for details on where discharge is allowed
[9] More than 15 ppm of oil.
[10] 3 nautical miles from shore. Alaskan waters for most definitions.
[11] Outside United States Territorial Seas

Subsection 2: General Wastewater and EPA VGP

General note- for EPA VGP items the definition of minimize is "reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best marine practice.

Job Aid Item: 1.2.a

Text: Boiler blow down water is handled IAW VGP 2.2.6

What to check: Boiler/economizer blowdown may not be discharged in EPA VGP waters (3nm) unless the conditions stated in the VGP are met.

Figure 9- Boiler drain line

Information: Boiler blowdown discharge can contain high levels or metals or other priority pollutants. The EPA determined that this discharge should be mimized near shore and in port. Boilers on board of modern large cruise ships are not for the generation of steam for main propulsion. The generated steam is used for heating purposes. Most vessels have dedicated tanks where the "boiler blow downs" are stored. The boilers have "top and bottom" blown downs. Some vessels do periodical blow downs (top bottom), other vessels have these blown downs automated (with a timer) others do continuous blown downs. It has been noticed in previous seasons that some vessels directed their blow down water into bilge spaces and treated this water through the OWS system. From there the treated water was comingled with the influent of the AWTS. The OR needs to understand these operations in detail and to document this, including the estimated volumes. In general the blow down volumes should correlate closely to the boiler system makeup water.

Figure 10- Boiler soot trap

Citation: EPA VGP 2.2.6 Boiler/Economizer Blowdown

You must minimize the discharge of boiler/economizer blowdown in port if chemicals or other additives are used to reduce impurities or prevent scale formation. For vessels greater than 400 gross tons which leave the territorial sea at least once per week, boiler/economizer blowdown may not be discharged in waters subject to this permit, unless:

- The vessel remains within waters subject to this permit for a longer period than the necessary duration between blowdown cycles;
- The vessel needs to conduct blowdown immediately before entering drydock; or
- For safety purposes.

For all vessels, boiler/economizer blowdown may not be discharged in waters referenced in Appendix G except for safety purposes. Furthermore, boiler/economizer blowdown should be discharged as far from shore as practicable.

Job Aid Item: 1.2.b

Text: Chemically treated cooling water handled correctly (e.g. anti freeze etc.) IAW VGP 2.2.19

Background: Most vessels have conditioned spaces for their equipment so anti freeze may not be used in all the engines or in equipment cooling water systems. However, emergency diesels, lifeboat engines may have antifreeze in systems. These systems are regularly changed and most vessels have collection plans / recycling methods in place.

What to check: Toxic or hazardous substances added to or removed from cooling water are not allowed to enter a water body. For example, to the bilgewater or wastewater systems for discharge overboard.

Citation: EPA VGP 1.2.3.8

1.2.3.8 Discharges of Noxious Liquid Substance Residues

Discharges of noxious liquid substance residues subject to 33 CFR Part 151, Subpart A are not eligible for coverage under this permit.

AS 46.03.745. Hazardous substance release.

Except for a controlled release, the reporting of which is the subject of an agreement with the commissioner under AS 46.09.010 (b), a person may not cause or permit the release of a hazardous substance as defined in AS 46.09.900.

AS 46.09.900. Definitions.

(4) "hazardous substance" means (A) an element or compound that, when it enters into or on the surface or subsurface land or water of the state, presents an imminent and substantial danger to the public health or welfare, or to fish, animals, vegetation, or any part of the natural habitat in which fish, animals, or wildlife may be found; or (B) a substance defined as a hazardous substance under 42 U.S.C. 9601 - 9657 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980); "hazardous substance" does not include uncontaminated crude oil or uncontaminated refined oil;

Job Aid Item: 1.2.c

Text: If seawater piping bio-fouling chemicals and chlorine are used, use is minimized IAW VGP 2.2.20

What to check: Biofouling chemicals used according to their FIFRA label if a registered pesticide. A FIFRA label will include information on application amounts and how to apply the chemical treatment.

Background: The EPA included this item in the VGP in an attempt to mimimize the use of pesticides near shore. Effective pesticides/herbicides may have unintentional environmental impacts because of the fact they are used to kill biofouling organisms. Some vessels use antibiofouling chemicals to keep the "sea water side" clean. Some vessels reduce the dosing rate of the chemicals while in Alaskan waters or in port. Some vessels may have multiple systems installed on their primary water (raw / seas water) system.

Citation: EPA VGP 2.2.0 Seawater Piping Biofouling Prevention

Seawater piping biofouling chemicals subject to FIFRA registration (see 40 CFR §152.15) must be used in accordance with their FIFRA label. No pesticides or chemicals banned for use in the United States may be discharged into waters subject to this permit.
Vessel owner/operators must use the minimum amount of biofouling chemicals needed to keep fouling under control. Discharges containing active agents must contain as little chlorine as possible.
Vessel owner/operators must remove fouling organisms from seawater piping on a regular basis and dispose of removed substances in accordance with local, state, and federal regulations. Removed fouling organisms shall not be discharged into waters subject to this permit and EPA recommends that if discharged into any waters, should be discharged more than 50 nm from shore. Vessel owner/operators should remove any organisms while at sea where technically feasible to reduce the risk of invasive species introduction in ports.

Job Aid Item: 1.2.d

Text: Cathodic Hull protection used IAW VGP 2.2.7

What to check: Sacrificial anodes must not be used more than necessary to adequately prevent corrosion of the vessel's hull, sea chest, rudder, and other exposed areas of the vessel.

Background: The EPA included this item in the VGP because of a concern of discharge of potentially toxic levels of metals such as copper, zinc, and aluminum. Most vessels have installed a copper anode system (such as the Cathelco system). These are sacrificial copper anodes. These anodes are in most cases installed in the seawater intakes in the sea chest. The control "effectiveness' for each system is controlled by the Cathelco output parameter. Most vessels reduce the output to minimize the anode wear, while maintaining sufficient protection. For all installed systems Ocean Rangers need to understand the use and working of the system and how they are operated.

Citation: EPA VGP 2.2.7 Cathodic Protection

Cathodic protection must be maintained to prevent the corrosion of the ship's hull. The discharge of zinc, magnesium, and aluminum are expected from properly functioning cathodic protection sacrificial electrodes. However, vessel operators must minimize the flaking of large, corroded portions of these anodes. Sacrificial anodes must not be used more than necessary to adequately prevent corrosion of the vessel's hull, sea chest, rudder, and other exposed areas of the vessel. Vessel operators must appropriately clean and/or replace these anodes during periods of maintenance (such as drydocking), so that release of these metals to waters is minimized. Furthermore, when feasible, sacrificial anodes should be flush-fitted to the hull, or vessel operators must fill the space between the anode and hull backing to remove the potential for hotspots for fouling organisms.

Figure 11: Cathodic Protection power supply

Vessel operators should note that magnesium is less toxic than aluminum and aluminum is less toxic than zinc. If vessel operators use sacrificial electrodes, they must select electrode devices with metals that are less toxic to the extent technologically feasible and economically practicable and achievable. For vessels that spend the majority of their time in freshwater, if aluminum or zinc is selected, the vessel owner/operator must document in their recordkeeping documentation why the use of magnesium is not appropriate. Likewise, for vessels that spend the majority of their time in saltwater, if vessel zinc is selected, the vessel owner/operator must document why aluminum is not selected. The documentation requirement is applicable after the vessel's first drydocking after December 19, 2013 (e.g., if the vessel drydocks in 2015, the requirement is applicable for that vessel starting in 2015).
EPA recommends, particularly for new vessels, the use of Impressed Current Cathodic Protection (ICCP) in place of or to reduce the use of sacrificial electrodes when technologically feasible (e.g., adequate power sources,

appropriate for vessel hull size and design), safe, and adequate to protect against corrosion. If vessel operators use ICCP, they must maintain dielectric shields to prevent flaking.

Job Aid Item: 1.2.e

Text: Prohibited sources, e.g. hazardous materials from photo shop/print shops, hospital, laboratories, carpentry paint shops, upholstery shops, etc do not enter the GW, BW or bilge systems IAW VGP 2.1.2 & 5.1.1.1.4 and AS 46.03.745

What to check: Monitor for hazardous or toxic substances being discharged into either wastewater streams or bilgewater. This will most likely occur during other checks. Note that there are several questions in the Hazardous Waste section that relate to this item, in particular looking at handling of these wastes.

Background: The addition of hazardous waste to a water body is prohibited. Current AWTS and OWS technology does not treat many of these substances well or at all. Adding toxic wastes has and will cause damage to a wastewater treatment system, particularly those with biological processes. Under the EPA VGP vessel operators may not add substances that drain to the bilgewater that are not produced in the normal operation of a vessel. During overhauls and cleaning operations, noxious liquid substances may enter the bilge system. Possible operations that use chemicals are the EVAP cleaners , plate cooler cleaners, air cooler cleaners etc. Most vessels do take precautions that during the maintenance operations so that these substances are not entering the bilge areas. OR should observe and document all maintenance activities and related actions.

Citations: EPA VGP 2.1.2 Toxic and Hazardous Materials

Where consistent with vessel design and construction, you must locate toxic and hazardous materials in protected areas of the vessel to minimize exposure to ocean spray and precipitation, unless the Master determines this would interfere with essential vessel operations or safety of the vessel or doing so would violate any applicable regulations promulgated by the Secretary of the Department in which the Coast Guard is operating that establish specifications for safe transportation, handling, carriage, and storage of pollutants (see Part 2.1.5). Any discharge made for the foregoing reasons must be documented consistent with Part 4.2. You must ensure that toxic and hazardous materials are in appropriate sealed containers constructed of a suitable material, labeled, and secured. Containers must not be overfilled and incompatible wastes should not be mixed. Exposure of containers to ocean spray or precipitation must be minimized. Jettisoning of containers holding toxic or hazardous material is not authorized by this permit.

EPA VGP (for vessels over 500 passengers): 5.1.1.1.4 Other Materials

Waste from mercury-containing products, dry cleaners or dry cleaner condensate, photo processing labs, medical sinks or floor drains, chemical storage areas, and print shops using traditional or non-soy-based inks and chlorinated solvents must be prevented from entering the ship's graywater, blackwater, or bilgewater systems if water from these systems will be discharged into waters subject to this permit. Preventing these wastes from entering these systems can be accomplished by plugging all drains that flow to the graywater, blackwater, or bilge systems in areas where these wastes are produced and creating alternate waste receptacles or replumbing drains to appropriate holding tanks.

Vessel owners/operators must not discharge any toxic or hazardous materials, including products containing acetone, benzene, or formaldehyde into salon and day spa sinks or floor drains if those sinks or floor drains lead to any system which will be discharged into waters subject to this permit. This includes using these materials on passengers (or crew) and rinsing residuals into these sinks. Alternate waste receptacles or holding tanks must be

used for these materials. Additions of these materials to any systems which will discharge into waters subject to this permit is a permit violation.

AS 46.03.710. Pollution prohibited.

A person may not pollute or add to the pollution of the air, land, subsurface land, or water of the state.

AS 46.03.745. Hazardous substance release.

Except for a controlled release, the reporting of which is the subject of an agreement with the commissioner under AS 46.09.010 (b), a person may not cause or permit the release of a hazardous substance as defined in AS 46.09.900.

Figure 12-Example leak potential into bilge

EPA VGP 1.2.3 Limitations on Coverage:

1.2.3.3 Used or Spent Oil

Discharges of used or spent oil no longer being used for their intended purposes are not eligible for coverage under this permit.

1.2.3.5 Photo processing effluent

Discharges from photo-processing operations are not eligible for coverage under this permit.

1.2.3.6 Effluent from Dry Cleaning Operations

Discharges of spent or unused effluent from dry cleaning operations are not eligible for coverage under this permit. This includes any spent or unused tetrachloroethylene (perchloroethylene) from these operations.

1.2.3.7 Discharges of Medical Waste and Related Materials

Discharges of medical waste as defined in 33 U.S.C. 1362(20) are not eligible for coverage under this permit. Discharges of spent or unused pharmaceuticals, formaldehyde or other biohazards no longer being used for their intended purposes are not eligible for coverage under this permit.

For purposes of the VGP, the liquid produced by dialysis treatment of humans is not deemed to be “medical waste,” and, like other human body waste, is subject to regulation under CWA § 312 if introduced into marine sanitation devices, or under VGP Part 2.2.25 if added to a blackwater system combined with a graywater system. The direct overboard discharge of such liquid without treatment is not authorized by the VGP.

1.2.3.8 Discharges of Noxious Liquid Substance Residues

Discharges of noxious liquid substance residues subject to 33 CFR Part 151, Subpart A or 46 CFR §153.1102 are not eligible for coverage under this permit.

1.2.3.9 Tetrachloroethylene (Perchloroethylene) and Trichloroethylene (TCE) Degreasers

Discharges of tetrachloroethylene and trichloroethylene (TCE) degreasers or other products containing tetrachloroethylene or trichloroethylene are not eligible for coverage under this permit.

2.2.2 Bilgewater (excerpt)

All bilgewater discharges must be in compliance with the regulations in 40 CFR Parts 110 (Discharge of Oil), 116 (Designation of Hazardous Substances), and 117 (Determination of Reportable Quantities for Hazardous Substances) and 33 CFR §151.10 (Control of Oil Discharges). In addition:

• Vessel operators may not use dispersants, detergents, emulsifiers, chemicals, or other substances that remove the appearance of a visible sheen1 in their bilgewater discharges. This requirement does not prohibit the use of these materials in machinery spaces for the purposes of maintaining or cleaning equipment.

• Except in the case of flocculants or other required additives (excluding any dispersants or surfactants) used to enhance oil/water separation during processing (after bilgewater has been removed from the bilge), vessel operators may not add substances that drain to the bilgewater that are not produced in the normal operation of a vessel. The use of oil solidifiers, flocculants, or other required additives are allowed only as part of an oil water separation system provided they do not alter the chemical make-up of the oils being discharged and any discharge of such materials into waters subject to this permit must be minimized. Routine cleaning and maintenance activities associated with vessel equipment and structures are considered to be normal operation of a vessel if those practices fall within normal marine practice.

• All vessels must minimize the discharge of bilgewater into waters subject to this permit. This can be done by minimizing the production of bilgewater, disposing of bilgewater on shore where adequate facilities exist, or discharging into waters not subject to this permit (i.e., more than 3 nautical miles [nm] from shore) for vessels that regularly travel into such waters. Though not regulated under this permit, EPA notes that discharges of bilgewater outside waters subject to this permit (i.e., more than 3 nm from shore) are regulated under Annex I of the International Convention for the Prevention of Pollution from Ships as implemented by the Act to Prevent Pollution from Ships and U.S. Coast Guard regulations found in 33 CFR part 151.

• Vessels greater than 400 gross tons shall not discharge untreated oily bilgewater (i.e., bilgewater not treated with an onboard separator or bilgewater with a concentration of oil greater than 15 ppm) into waters subject to this permit.

• Vessels greater than 400 gross tons that regularly sail outside the territorial sea (at least once per month) shall not discharge treated bilgewater within 1 nm of shore if technologically feasible (e.g., holding would not impact safety and stability, would not contaminate other holds or cargo, or would not interfere with essential operations of the vessel). Any discharge which is not technologically feasible to avoid must be documented as part of the requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

• Vessels greater than 400 gross tons shall not discharge treated bilgewater into waters referenced in Appendix G unless the discharge is necessary to maintain the safety and stability of the ship. Any discharge of bilgewater into these waters must be documented as part of the recordkeeping requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

• For vessels greater than 400 gross tons that regularly sail outside the territorial sea (at least once per month), if treated bilgewater is discharged into waters subject to this permit, it must be discharged when the vessel is underway (sailing at speeds greater than 6 knots), unless doing so would threaten the safety and stability of the ship. EPA notes that vessel operators may also choose to dispose of bilgewater on shore where adequate facilities exist. Any discharge which is made for safety reasons must be documented as part of the requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

Job Aid Item: 1.2.f

Text: Gas turbine wash water discharged < 3 nm (Does not include turbo blowers / chargers on diesel engines) IAW IAW VGP 2.2.14 & 40 CFR 110

What to check: Gas turbine washwater not directly discharged within 3nm of shore.

Background: EPA found that turbine washwater could contain solvents, high levels of metals, and oily residues. There is concern these solvents if mixed with bilge water could allow for discharge of oily wastes. At this time the VGP only addresses gas turbines, it does not include turboblowers or turbochargers. Note that there are other check items referring to solvents, surfactants, and

hazardous wastes entering bilgewater- these could apply if the turboblowers are taken apart and washed on the deck of engine spaces.

Citation: EPA VGP 2.2.14 Gas Turbine Wash Water

Gas turbine wash water must not be directly discharged within waters subject to this permit. Where feasible, gas turbine washwater must be prevented from commingling with bilgewater that will be discharged in waters subject to this permit, for example by collecting it separately and properly disposing of it at an onshore facility. Under no circumstances may oils, including oily mixtures, from gas turbine wash water be discharged in waters subject to this permit in quantities that may be harmful as determined in accordance with 40 CFR Part 110.

Job Aid Item: 1.2.g

Text: Fire main discharge only in emergencies, deck wash down or secondary uses IAW VGP 2.2.12

What to check: Fire mains only discharged for emergency training, certification, emergencies, or if the intake comes from seawater or potable water.

Background: The EPA was concerned about high levels of metals found in firemain waters being discharged and wanted to minimize use of fire mains near shore.

Citation: EPA VGP 2.2.12 Firemain Systems

Discharges from firemain systems are authorized for emergency purposes to ensure the safety and security of the vessel and her crew, other emergency situations, and testing and inspections of the firemain systems in order to assure its operability in an emergency. Firemain systems may be discharged in port for certification, maintenance, and training requirements if the intake comes directly from the surrounding waters or potable water supplies and there are no additions (e.g., AFFF) to the discharge. Furthermore, firemain systems may be used for deck washdown or other secondary uses if the intake comes directly from the surrounding waters or potable water supplies and the discharge meets all relevant effluent limitations associated with that activity. When feasible, maintenance and training should be conducted outside port and/or outside waters subject to this permit.
The vessel owner/operator shall not discharge firemain systems in waters listed in Appendix G except in emergency situations or when washing down the anchor chain to comply with anchor wash down requirements in Part 2.2.8.

Job Aid Item: 1.2.h

Text: Pool /spa water discharges in Alaska waters performed IAW VGP 5.1.1.2 and 5.1.2.3

What to check: For discharges of pool and spa water overboard within 3nm. If discharges occur check that they were dechlorinated and debrominated, and if these levels were measured as required. Chlorine limits are the same as the Alaska WW GP. Monitoring (testing) must be done if discharges occur within 3nm of Alaska. Note: Discharges of pool and spa water are prohibited in national parks, federal wilderness areas, national wildlife refuges, marine sanctuaries, and national wild and scenic rivers. The largest prohibited area of interest would likely be Glacier Bay National Park. Because many of these areas have boundaries that are difficult to determine, please note the position on your report so that ADEC can determine if the location is in a prohibited area.

Background: Cruise ships have large volumes of spa and pool water. While these waters can be relatively clean, they can include high concentrations of chlorine or bromine compounds which are by their nature toxic to marine life. In the case of fecal or vomit incidents high levels of these compounds are used to sanitize the water, often at levels unsafe for humans as well. Accidental

discharges of pool and spa water also occur due to valve malfunctions or crew error. Another item of concern is if this water is introduced to the wastewater system it could damage membranes or impact biological processes.

Most vessels have dedicated tanks to hold the pool, spa, and Jacuzzi waters. These tanks could be also tanks already used for other ww types and could be mixed. Some vessels neutralize the pool and spa water before discharging overboard or into tanks. Ocean Rangers need to understand these operations and how the neutralization is done, how the volume is determined and all other pertinent information. It is useful to determine if these discharges are included in the discharge logbook.

Citations:
Although this citation is for ships over 500 passengers, there are identical VGP citations for ships with 100 to 500 passengers.

EPA VGP 5.1.1.2 (and 5.2.1.2) Pool and Spa Discharges

Discharges of pool or spa water to waters listed in Appendix G are not authorized under this permit. Discharges from pools and spas are authorized into non-Appendix G waters subject to this permit, provided pool and spa water to be discharged is dechlorinated and/or debrominated, and discharge occurs while the vessel is underway. To be considered dechlorinated, the total residual chlorine in the pool or spa effluent must be less than 100 µg/l if the pool or spa water is discharged without going through an Advanced Wastewater Treatment System (AWTS). To be considered debrominated, the total residual oxidant in the pool or spa effluent must be below 25 µg/l if the pool or spa water is discharged without going through an AWTS. Pool and spa water may be added to the graywater treatment systems; however, any resultant discharge must meet all standards and requirements found in Part 5.1.1.1 and must be dechlorinated and/or debrominated as applicable.

EPA VGP 5.1.2.3 (and 5.2.2.3) Treated Pool and Spa Discharges

Vessel owners/operators must monitor chlorine or bromine concentrations (as applicable) in pool or spa water before every discharge event using sufficiently sensitive 40 CFR Part 136 methods if they will discharge these streams directly into waters subject to this permit to ensure that the dechlorination/debromination process is complete. If vessel owners/operators are monitoring bromine concentrations, they may use a field test kit which uses the colorimetric method in lieu of 40 CFR Part 136 methods to ensure waters have been debrominated, provided that test kit has a method detection limit no higher than 50 µg/l. You must record the location of the discharge, the estimated volume of the discharge, and the concentration of chlorine or bromine (as applicable). Records of this monitoring must be kept with other graywater monitoring records.

For chlorine, analytical results below the method detection limit shall be deemed compliant with the effluent limits, provided the permittee uses a testing method with a detection limit no higher than 10.0 µg/L under ideal conditions. EPA recommends Method SM4500-CL G (DPD Colorimetric Method) for these purposes as it is able to reach 10 µg/L under ideal conditions and so meets these requirements. SM4500-Cl G is typically the method that ADEC/USCG uses for compliance monitoring. For bromine, analytical results below the method detection limit shall be deemed compliant with the effluent limits, provided the permittee uses a testing method with a detection limit no higher than 50.0 µg/l.

Job Aid Item: 1.2.i

Text: Deck wash down / hull cleaning (above waterline) IAW VGP 2.2.1

What to check: Monitor exterior cleaning and maintenance operations when feasible. Check for safeguards to prevent oily wastes, paints, and debris from entering waters. These must be minimized, but the EPA defines as "reduce and/or eliminate to the extent achievable using control measures

(including best management practices) that are technologically available and economically practicable and achievable in light of best marine practice."

Check for foamy discharge, sheens, and floating waste from runoff or deck wash. Check for large pieces of rust, paint, metal, etc. being washed or dropped over the side. Check for tarp covers, paint can controls, debris collection, rust capture controls.

Non-toxic and "phosphate free" (below 0.5% phosphates) cleaners are to be used if water is discharged within 3nm of shore. Unused paint cannot be discharged into water. Check on products used.

Background: Maintenance and cleaning activities could introduce oils, grease, paints, toxic chemicals, or solid wastes into the water. Sheens have been observed from painting activities in the past. There is a also a long term concern about paint chips and other wastes accumulating in large quantities and leaching out toxins. Most operators have been careful about hull maintenance, deck maintenance, and painting operations. For example, using tarps under painting activities should reduce dripped paint entering seawater.

Figure 13-Example of painting with drop cloth protection

The methods and products used for deck cleaning vary. In particular the teak decks and wood composite decks are cleaned with special cleaners. It would be useful to check these products.

Some operators do touch up painting on vessels, in particular the outside hull scantlings which are in direct sight. Mostly these operations are performed in Skagway and Juneau. Good indicators are the cherry pickers on the docks.

Citation: EPA VGP 2.2.1 Deck Washdown and Runoff and Above Water Line Hull Cleaning

Vessel owner/operators must minimize the introduction of on-deck debris, garbage, residue and spill into deck washdown and runoff discharges. Before deck washdowns occur, you must broom clean (or equivalent) exposed decks or use comparable management measures and remove all existing debris. When required by their class societies (e.g., oil tankers), their flag Administrations, or the U.S. Coast Guard, vessels must be fitted with and use perimeter spill rails and scuppers to collect the runoff for treatment. Where feasible, machinery on deck must have coamings or drip pans where necessary to collect any oily discharge that may leak from machinery and prevent spills. The drip pans must be drained to a waste container for proper disposal and/or periodically wiped and cleaned. Additionally, to reduce the risk of any leakage or spills of harmful oils into the aquatic environment, EPA strongly encourages the use of environmentally acceptable lubricants in all above deck equipment. The presence of floating solids, visible foam, halogenated phenol compounds, and dispersants, or surfactants in deck washdowns must be minimized. Vessel owners/operators must minimize deck washdowns while in port.

Vessel owners/operators must maintain their topside surface and other above water line portions of the vessel to minimize the discharge of rust (and other corrosion by-products), cleaning compounds, paint chips, non-skid material fragments, and other materials associated with exterior topside surface preservation. Furthermore, vessel owners/operators must minimize residual paint droplets from entering waters subject to this permit whenever they are conducting maintenance painting. Possible minimization techniques include, but are not limited to, avoiding paint spraying in windy conditions or avoiding overapplication of paint. This permit does not authorize the disposal of unused paint into waters subject to this permit.

If deck washdowns or above water line hull cleaning will result in a discharge, they must be conducted with "minimally-toxic" and "phosphate free" cleaners and detergents as defined in Appendix A of this permit. Furthermore, cleaners and detergents should not be caustic and must be biodegradable.

Definitions:

"Minimally-Toxic Soaps, Cleaners, and Detergents" means any substance or mixture of substances which has an acute aquatic toxicity value (LE50) corresponding to a concentration greater than 10 ppm and does not produce "byproducts" with an acute aquatic toxicity value (LE50) less than 10 ppm. EPA expects that minimally-toxic soaps, cleaners, and detergents will contain little to no nonylphenols.

"Phosphate Free" soaps, cleaners, and detergents means these materials which contain, by weight, 0.5 percent or less of phosphates or derivatives of phosphates.

Job Aid Item: 1.2.j

Text: Anchor chain and anchor washed down IAW 33CFR 151.2050(e)

Background: The spread and transfer of invasive species is a worldwide concern. Invasive species have caused economic and environmental damage. Some species are already being tracked moving towards Alaska, for example the European Green Shore Crab has spread from Europe to California and is now seen in British Columbia. The species could impact shellfish farms in Alaska.

One way to delay the spread of invasive species is to wash off sediment that could harbor organisms from one port to another. The anchor and anchor chain are potential vectors for the spread of invasive species. Anchorages in Alaska occur in Sitka, Hoonah (Pt Icy Strait), Juneau, Ketchikan, and could occur at other ports. Please note that anchorwash operations are not logged on several vessels as there is no requirement, so it is best to observe as this operation is done.

Figure 16: Anchor winch

What to check: Anchors and anchor chains are rinsed when retrieved. (33 CFR 151.2035(a(5)) The anchor chain must be "carefully and thoroughly washed down" (EPA VGP 2.2.8).

Citations: 33 CFR 151.2050 (e) Additional Requirements-nonindigenous species reduction practices

(e) Rinse anchors and anchor chains when you retrieve the anchor to remove organisms and sediments at their place of origin.

EPA VGP 2.2.8 (Chain Locker effluent)

The anchor chain must be carefully and thoroughly washed down (i.e., more than a cursory rinse) as it is being hauled out of the water to remove sediment and marine organisms. In addition, chain lockers must be cleaned thoroughly during dry-docking to eliminate accumulated sediments and any potential accompanying pollutants. For vessels that regularly sail outside waters subject to this permit (at least once a month), if technically feasible, periodically clean, rinse, and/or pump out the space beneath the chain locker prior to entering waters subject to this permit (preferably mid-ocean) if the anchor has been lowered into any nearshore waters. Furthermore, for vessels that leave waters subject to this permit at least once per month, chain lockers shall not be rinsed or pumped out in waters subject to this permit, unless not emptying them would compromise safety. Such a safety claim must be documented in the vessel's recordkeeping documentation consistent with Part 4.2.

Job Aid Item: 1.2.k

Text: Exhaust Gas Scrubber Discharges (in Alaska) IAW VGP 2.2.26

What to check: The VGP contains monitoring requirements for scrubbers which discharge. Only check this if a scrubber is in operation and discharging into state waters (3nm from shore).

Background: Exhaust gas scrubbers may use seawater to reduce the sulfur emissions from combustions sources. The scrubbers could be a concern if not operating as designed, with issues such as pH outside established limits, or soot and oils. The EPA has established monitoring standards in the 2013 VGP.

Citations: VGP 2.2.26 Exhaust Gas Scrubber Wastewater Discharge

Exhaust gas scrubber washwater discharge must not contain oil, including oily mixtures, in quantities that may be harmful as determined in accordance with 40 CFR Part 110. Sludge or residues generated in treating exhaust gas scrubber washwater discharge must not be discharged in waters subject to this permit and must be delivered ashore to adequate reception facilities.

In addition, owner/operators of vessels with exhaust gas cleaning systems that result in washwater discharges must meet the numeric effluent limits found in Part 2.2.26.1 and the monitoring requirements found in Part 2.2.26.2 this permit. These limits are consistent with the IMO washwater guidelines set forth in section 10 for Exhaust Gas Cleaning (EGC) Systems (resolution MEPC.184(59)). Among other things, these guidelines recommend the establishment of limits for concentrations of pollutants in the effluent.

Section 1: Subsection 3: Permitted Vessels

Job Aid Item: 1.3.a

Text: Approved VSSP is up-to-date and available onboard IAW AS 18AAC 69.025(f) and 33 CFR 157.317(b)

What to check: The Vessel Specific Sampling Plan (VSSP) is carried onboard and is available. The VSSP should be checked in the seasonal report. For regular checks, check the VSSP if changes have been made- for example to tanks used, or types of WW treated.

Background: The purpose of the VSSP is to explain how samples are taken so they are representative of typical wastewater treatment process. Inaccuracies have been found in VSSPs, often when changes are made onboard. The VSSP needs to be available as a reference. A copy of a sample VSSP is included as wastewater example 2.

Citations: 18 AAC 69.025 Plan of sampling techniques and analytical testing methods.

(f) The owner or operator shall maintain a copy of the valid, approved plan of sampling

techniques and analytical testing methods on board each vessel that the owner or operator causes or allows to be operated in the marine waters of the state. (Eff. 11/15/2002, Register 164)

Job Aid Item: 1.3.b

Text: Sampling events

i. Follow the approved VSSP and Quality Assurance Project Plan sampling procedures IAW AS 18 AAC 69.025 & 030 and 33 CFR 159.317
ii. Sample results (if available same day) IAW GP limits for Fecal Coliform and Total Suspended Solids in effluent (GP 5.3)

iii. Field test results for pH and chlorine (if sampling event is witnessed) within GP limits (GP 5.3)

What to check: Check only if a sample is taken. The QAPP is a complex document, and it is not possible to check in the field that all elements of the QAPP are followed. The main concern is that the sample is representative and taken correctly. If there is a question please submit it as a question report, photos can be helpful along with a full description and the sample number.

The following items need to be checked. Please note there is a related safety question on sampling.

- Does the sample valve match the location and name in the VSSP?
- Was the vessel discharging at time of sample (for Alaska GP samples only)?
- Does the effluent match what is discharged (same line and not mixed)?
- Is the sample port within 50 feet of the overboard port?
- Were field tests taken within 15 minutes of the sample (chlorine, pH, temperature)?
- Were field tests taken with approved QAPP equipment (no test strips)?
- Was the sample promptly cooled with icewater?
- Any signs of potential contamination- such as solids or liquids entering the bottle from other sources?
- Was sample valve disinfected and flushed prior to sampling?
- Reasonable number of sample bottles/sample volume. The smallest sample should be about at least a liter of water and four or more bottles.
- Was chlorine below 0.1 mg/liter (GP and USCG compliance limit based on the method detection limit)
- Was pH between 6.5 and 8.5 if sampling while discharging (AK limit), or 6.0 and 9.0 for USCG compliance sampling while recirculating?
- If fecal or TSS results are known the same day, are these results above the permit limits (43 FCU or 150 mg/L for TSS)?

There is a sample/field checklist included in the QAPP. This is useful for checking for QAPP compliance.

Background: It is extremely important that samples are taken correctly and are representative of typical discharges. The sample results are often used for compliance actions, for writing future permits, and other actions taken by ADEC and the USCG. ADEC invests a lot of time and resources in sampling, the QAPP, and VSSPs. Ocean Rangers have an important position in being able to observe samples being taken, particularly underway. If a sample is taken incorrectly it could skew sample results, require a resampling, or result in compliance actions. For example, a sample port that is not flushed could have test results that show much higher bacteria levels than what might exist in the discharge line.

There is a sample/field checklist included in the QAPP. This would be very useful for checking for QAPP compliance.

Citations: The latest Quality Assurance Project Plan will be included in reference files. A sample VSSP is available at the end of this section.

AS 46.03.465 Information Gathering Requirements

(b) While a commercial passenger vessel is present in the marine waters of the state, the owner or operator of the vessel shall provide an hourly report of the vessel's location based on Global Positioning System technology and collect routine samples of the vessel's treated sewage, graywater, and other wastewaters being discharged into marine waters of the state with a sampling technique approved by the department.

33 CFR 159.317(a) Sampling and Reporting

(6) Ensure all samples, as required by this section, are collected and tested by a laboratory accepted by the Coast Guard for the testing of conventional and priority pollutants, as defined by this subpart, and in accordance with the cruise vessel's Coast Guard accepted QA/QCP and VSSP;

18 AAC 69.025 (a&b&f). Plan of sampling techniques and analytical testing methods

(a) On or before March 1 of each calendar year, except in a calendar year in which a plan is valid for the calendar year under (c) of this section, an owner or operator who intends to cause or allow sewage, graywater, or other wastewater to be discharged into the marine waters of the state shall submit a plan of sampling techniques and analytical testing methods to be used for purposes of AS 46.03.465. The plan must include

(1) the quality assurance and quality control measures to be used during sample collection, analysis, and reporting undertaken to comply with AS 46.03.465;

(2) a detailed description of sampling techniques, analytical testing methods, and equipment, including information about sampling preservation methods, sample holding times, transportation protocols, and the chain of custody;

(3) laboratory analytical information, including methods used, calibration, detection limits, and the laboratory's quality assurance and quality control measures;

(4) procedures for quality assurance and quality control audits used to determine the effectiveness of the plan; and(5) procedures for data validation used to assess precision, accuracy, representativeness, comparability, and completeness of the measured parameters in the data obtained from the samples.

(b) Sampling under AS 46.03.465 may not occur before the department approves a plan of sampling techniques and analytical testing methods.

(f) The owner or operator shall maintain a copy of the valid, approved plan of sampling techniques and analytical testing methods on board each vessel that the owner or operator causes or allows to be operated in the marine waters of the state.

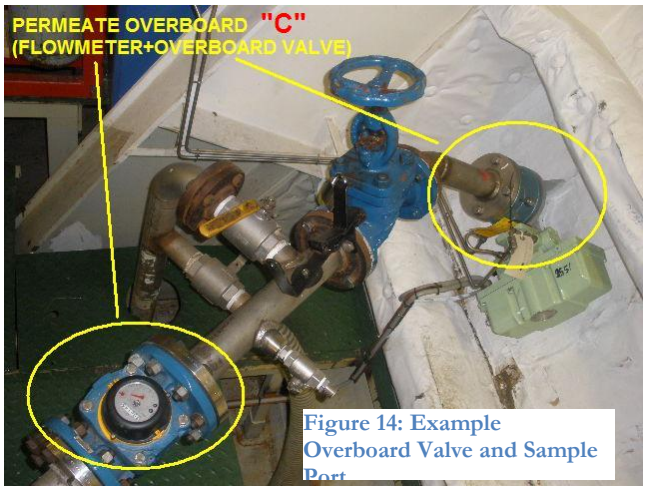


Figure 14: Example Overboard Valve and Sample Port

Job Aid Item: 1.3.c

Text: Discharge log identifies daily estimated volume, date, location, and length of each stay if discharge occurs while anchored or docked. While underway between each port estimates average flow rate, dates while en route, and average speed. Flow rate recorded by type. Time / date is in 24 hrs clock format at the start (beginning) and end (stop) of each discharge IAW 18 AAC 69.050 (c) (for continuous or automatic discharge only)

What to check: Check discharge logs, if a vessel has continuous or automatic discharges in Alaska then the times are shown in 24 hour format, and that the time and date of each stay at a port of call is identified. Flow rates, discharge types, and locations must also be entered. For each stay at port, a

log needs to include the date, flow rate while in port, and time of arrival and departure. For underway only continuous discharges the dates en route must be identified, along with average speed and flow rate.

Flow estimates and tank soundings and the estimation of discharge volumes should be assessed and identified. The seasonal report will list the methods used. "Combined" or "tandem" discharges (two tanks discharging from one pump) need to be carefully assessed. Some vessels recirculate and have intermediate "mini tanks" between the AWTS system and the overboard port. Trace these systems and report what exactly happens in the seasonal report.

Background: For vessels with continuous (or automatic) discharges the regulations were written to divide up the voyage with each port of call. Otherwise the discharge log would be one entry potentially. For continuous dischargers the 24 clock was required to differentiate between AM and PM on the logs.

These regulations only apply to continuous or automatic dischargers, either stationary or underway. Underway only dischargers only need to be checked for the regulations that apply to underway vessels (18 AAC 69 (c) 1,2,4). Continuous or automatic discharges are those where the systems is pumping continuously (continuous), or where the system pumps without an operator's direct input, such as from an AWTS tank where discharges are pumped every time the tank reaches a particular level.

Citation: 18 AAC 69.050. Treated sewage, graywater, and other wastewater discharge records and report.

(c) For an automatic or continuous discharge, in port, at anchorage, or underway, of treated sewage, graywater, or other wastewater into the marine waters of the state, the records required by AS 46.03.465(a) must describe for each voyage

(1) the daily estimated volume of discharge by type;
(2) a description of how the daily volume by discharge type was estimated;
(3) for each stay that a vessel makes at an anchorage or dock, the
    (A) date of the stay;
    (B) time expressed in a 24-hour clock format at the beginning and end of each docking or anchorage;
    (C) latitude and longitude of the stay; and
    (D) estimated average flow rate of discharge by type of discharge; and
(4) for each vessel route while the vessel is underway between each stay identified in (3) of this subsection, the
    (A) dates while en route;
    (B) time expressed in a 24-hour clock format at the beginning and end of each vessel route;
    (C) vessel's average speed; and
    (D) estimated average flow rate of discharge by type of discharge.

Job Aid Item: 1.3.d

Text: Onboard records describe how the daily discharge volumes are calculated/estimated/or metered IAW 18 AAC 69.050(c)(2)for continuous or automatic discharge only

What to check: If a vessel has continuous or automatic discharges in Alaska then the discharges must be calculated by type. The method of calculation or metering must be described. This would

likely be in the discharge log instructions either in the logbook or separately. The methods must be listed in the seasonal report.

Background: Operators need to identify how wastewater effluent volumes were measured.
Citation: 18 AAC 69.050 (c)

(2) a description of how the daily volume by discharge type was estimated;

Job Aid Item: 1.3.e

Text: The daily estimated volumes of WW discharged are recorded by type IAW AS 46.03.465(a), 18 AAC 69.050, and 33 CFR 159.315(b)

What to check: If a vessel has continuous or automatic discharges in Alaska then the volume of discharges must be calculated. Each type of effluent discharged must be calculated.

Background: Operators must identify volumes discharged by type. When the regulations were adopted it was more common for multiple types of effluent to be discharged in Alaska waters- for example graywater and blackwater separately. Today it is much more common for treated discharge to be from one source (the AWTS). Discharge logs must include volume discharged. The seasonal report must list the methods used to calculate volumes. Some vessels meter, but some had at one point disconnected meters. It is important to know the systems and how volumes are calculated or estimated.

Citation: 18 AAC 69.050. Treated sewage, graywater, and other wastewater discharge records and report.

(c) For an automatic or continuous discharge, in port, at anchorage, or underway, of treated sewage, graywater, or other wastewater into the marine waters of the state, the records required by AS 46.03.465(a) must describe for each voyage.

(1) the daily estimated volume of discharge by type;

Job Aid Item: 1.3.f

Text: WW discharge performed IAW GP Authorization Letter. (AS 46.03.462 (a)) and GP 4.4

What to check: Check discharge logs, what valves are open or closed, tank levels to see if a vessel is following the GP authorization letter.

Background: The authorization letter will include what types of discharges the vessel is allowed in Alaskan waters, and will identify any limitations on that discharge. For example, some vessels are only allowed to discharge underway. These ships should be checked if there are any stationary discharges. Some vessels can only discharge specific types of wastewater, for example blackwater and accommodations graywater. In this example other graywater sources entering the waste stream such as galley water must be checked. An example of a GP authorization is included as wastewater example 1.

See the WW table provided by ADEC for a list of what ships are authorized to discharge.

Citation: ADEC WW GP- Section 4.4 on authorized discharges. See end of section for example letter.

Job Aid Item: 1.3.g

Text: Daily volumes were calculated / estimated /or metered in IAW GP 6.8.3

What to check: Total flow in cubic meters a day must be measured as a parameter in the GP. If the ship has a meter for effluent volume, this result must be used for the total flow measurement.

Figure 15: WW flow meters

Background: ADEC requires a total flow measurement from all wastewater treatment plants (not just ships). This is used to see if plant capacity was exceeded, and for information on total volumes of treated wastewater discharged. The 2010 GP included language that a meter must be used if installed after it was discovered some ships were estimating volume even when a meter was present. In fact, meters were disconnected. This made it more difficult to quantify actual volumes.

Citation: ADEC WW GP 6.8.3

Job Aid Item: 1.3.h

Text: WW outflow quantity monitoring is functioning properly (if installed) IAW AK GP 6.8.3

What to check: If daily total flow is measured with a meter, the meter must be functioning.

Background: Flow meters if installed must be functioning, connected, and reliable. This is to obtain the most accurate flow and volume data possible.

Citation: See 2014 GP 6.8.3

Job Aid Item: 1.3.i

Text: Food wastes and galley oils in GW IAW VGP 2.2.15

Note: Most ships separate galley graywater from their other graywater and keep out of the AWTS system. If the ship is a nondischarger, or segregates galley GW and only discharges it outside permitted waters there is no need to check this.

Figure 19 Pulper equipment in galley cleaning area

What to check: As much food and oil residue as practicable is removed from dishes before rinsing. Cooking oils are not directly added to graywater system.

Background: This is to reduce grease/cooking oils and nutrients from nearshore discharges. Oils or grease could foul the wastewater treatment system and could leave a sheen. Food waste can increase effluent parameters with limits such as BOD, TSS, and ammonia. Food waste is on most ships

separately collected and transported to dedicated holding tanks as a slurry. This may be done with dedicated recycled waste water flow. Food waste is normally not processed in the AWTS system. Galleys and other areas of the vessels where food is processed or handled may have installed grease separators / trap. Some vessels collect the spent oils from the galleys to use to "blend" (very small volumes of oils are available for this) in their HFO for the main engines or offload for use as biofuel.

Citation: EPA VGP 2.2.15 Graywater

Excerpt: "If graywater will be discharged in waters subject to this permit, the introduction of kitchen oils to the graywater system must be minimized. When cleaning dishes, you must remove as much food and oil residue as practicable before rinsing dishes. Oils used in cooking shall not be added to the graywater system. Oil from the galley and scullery shall not be discharged in quantities that may be harmful as defined in 40 CFR Part 110."

Job Aid Item: 1.3.j

Text: Sample valve and related piping is operable and IAW approved VSSP and 33CFR 159.317

What to check for: Sample valve used for samples matches the valve location, name and description in the VSSP. Check that sample valve is connected to the treated wastewater discharge line, and that it is less than 50 feet from the discharge port. Check for pipe looping and pipe arrangements that would lead to unrepresentative sample.

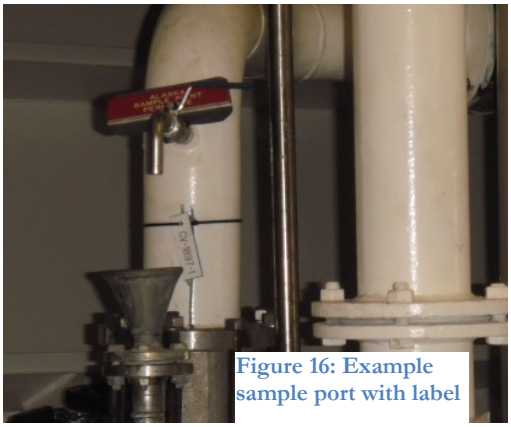


Figure 16: Example sample port with label

Background: The general permit requires that samples are representative of actual discharge, and that the sample port used must match the approved VSSP. Samples have been taken in the past from the wrong sample valve, or from a sample valve that would not represent a typical discharge.

The VSSP has the sample valve location and description, and in most cases a picture of the valve. The Ocean Ranger needs to check and document, any deviation or question with regards to the sample valve needs to be immediately reported and addressed. Do not rely on tag or name plates of the sample valve. The VSSP description (SB / PS and Frame location) will establish the correctness of the valve.

Citations: 18 AAC 69.030. Vessel specific sampling plan. (applicable parts)

(a) An owner or operator who intends to cause or allow the discharge of sewage, graywater, or other wastewater into the marine waters of the state shall submit a vessel specific sampling plan no later than 21 days before sampling required under AS 46.03.465 is to occur.

(b) A vessel specific sampling plan must include

- (7) a vessel schematic of discharge ports and corresponding sampling ports;
- (10) a table documenting
  - (A) the discharge type;
  - (B) whether the type of sample to be collected is grab or composite;
  - (C) parameters to be tested for each sample;
  - (D) the location on the vessel where each sample is to be collected;

Job Aid Item: 1.3.k

Text: AWTS system is capable of performing IAW the vessels approved VSSP and GP 2.3&8.1.1

What to check: AWTS is operating and has no major issues that would seriously degrade the unit's ability to meet General Permit (and federal) wastewater limits.

Background: ADEC has observed that an AWTS must be operational to meet permit and federal limits. These units are often made of individual components; the failure of one could lead to inadequately treated wastewater. For example, a failure of the UV system could allow high levels of bacteria to be discharged. If a membrane is ruptured and is continued to be used, this would allow solids and bacteria to pass through in high levels. Checks should be made if the system is operated as it regularly is during sample events.

Citation: AK WW GP – 2.3 & 8.1.1.

Job Aid Item: 1.3.l

Text: Observe repairs, maintenance, cleaning and other operations that may affect the WW treatment plant effluent quality. (GP 8.1)
What to check: Observe repairs and maintenance of the AWTS as opportunities come up. Watch for items that would degrade the performance of the system. Watch that cleaning chemicals (which can be very caustic) are handled properly and not directly discharged in Alaskan waters. Report equipment breakdowns if discharge continues.

Background: Repairs, maintenance, breakdown, and cleaning are necessary to keep wastewater treatment systems functioning as designed. Failure to perform these or to incorrectly perform could lead to a failure of the treatment systems and exceedances of state and federal limits. It would be difficult to check everything, but obvious failures should be noted. These regular operations are also a good opportunity to check on wastewater related questions such as VSSP checks. Checks should be made if the system is operated or maintained as it regularly is during sample events.

Sub-section 4: Permitted Vessels, when discharging while stationary

Job Aid Item: 1.4.a

Text: Estimated average flow for the GW BW, Mixed WW (m3/hr) while in port is logged IAW 18 AAC 69.050(c)(3) & (d)

What to check: Stationary dischargers (while docked or anchored) must record average flow rate for each stay in port. Check discharge logbook for entries.

Background: Flow rate information is critical to determine future permit dilution (mixing zone). It can be used to determine potential environmental impacts when combined with sample information. Some vessels have different operation regimes for their AWTS while in port and or underway. OR to check these operation regimes and which sections of the AWTS are dedicated to discharge under certain vessel conditions. A good question to check on is how volumes are calculated. It may be useful to trace discharge lines and valve settings used for each operation.

Citation: 18 AAC 69.050(c)

(3) for each stay that a vessel makes at an anchorage or dock, the

(A) date of the stay;
(B) time expressed in a 24-hour clock format at the beginning and end of each docking or anchorage;
(C) latitude and longitude of the stay; and
(D) estimated average flow rate of discharge by type of discharge;

Sub-section 5: Non-Discharge Vessels, and Permitted Vessels in no-discharge areas

Job Aid Item: 1.5.a

Text: Vessel had no WW discharge conducted in waters subject to GP requirements? AS 46.03.462 (a).

What to check: Discharge logs for any entries documenting accidental or emergency discharges. Check discharge log entries for locations of discharge that show unpermitted WW discharge. Watch for foam, solids, or unusual smells in the waters around the cruise ship. If discharge occurred fill out Incident Report.

Figure 21: Closed Discharge Valve

Background: Wastewater discharges in Alaskan waters require a permit (ADEC WW GP).

Most vessels have a valve locking regime in place. This would be useful information for the seasonal report. There should be procedures and policies in place to avoid a valve opening in prohibited areas.

Citation: Sec. 46.03.462. Terms and conditions of discharge permits.(See general citations)

AS 46.03.463 a & e. Prohibited discharges; limitations on discharges.

(a) Except as provided in (h) of this section, a person may not discharge untreated sewage from a commercial passenger vessel into the marine waters of the state.

(e) An owner or operator may not discharge any treated sewage, graywater, or other wastewater from a large commercial passenger vessel into the marine waters of the state unless the owner or operator obtains a permit under AS 46.03.100 and 46.03.462, and provided that the vessel is not in an area where the discharge of treated sewage, graywater, or other wastewaters is otherwise prohibited.

Alaska WW GP: -See discharge limitations section

Job Aid Item: 1.5.b

Text: Verify that overboard valves are closed / sealed in Alaska waters (AS 46.03.463(e))

What to check: Check for open valves on any valves that could discharge wastewater in Alaskan waters. Check valve opening regimes and other indicators of valve operations.

Background: Wastewater discharge is prohibited without a permit and in areas where not permitted. Most operators go beyond closing valves and lock valves while in Alaskan waters if the vessel

typically does not discharge. One area to check is arrival and departure from Skagway, where valves could be closed or opened.

Citation: AS 46.03.463. Prohibited discharges; limitations on discharges. (See general citations)

Job Aid Item: 1.5.c

Text: BW GW holding/ handling capacity is sufficient for the crew and passengers on board and the time in port, closed areas, or in Alaskan waters (AS 46.03.463(e) and 33CFR159.309)

What to check: Wastewater holding tanks have sufficient capacity for time in port.

Background: If a vessel is not allowed to discharge in a particular area they need a way to keep such wastewater from being discharged. Some operators have in the past not had enough capacity and have taken actions such as shutting laundry facilities or even holding waste in garbage and recycling cans. While these are acceptable, checks should be made that in these situations that waste is handled properly.

Citations: AS 46.03.463. Prohibited discharges; limitations on discharges. (see general citations)

Wastewater Examples:

Example 1: **General Permit Authorization Letter**

AUTHORIZATION TO DISCHARGE

Alaska Department of Environmental Conservation
Division of Water
CPVEC Program

AUTHORIZATION TO DISCHARGE UNDER THE LARGE COMMERCIAL PASSENGER VESSEL WASTEWATER DISCHARGE GENERAL PERMIT NO. 2013DB0004

FACILITY ASSIGNED AUTHORIZATION NUMBER: 2013DB0004-0016

***GENERAL PERMIT NUMBER:* 2013DB0004**
See this General Permit for all permit requirements.

The following facility is authorized to discharge in accordance with the terms of the State of Alaska General Permit 2013DB0004 and any specific requirements listed in this authorization.

The authorization effective date is **May 1, 2015.**

The authorization to discharge shall expire at midnight, **on the expiration or termination date of General Permit 2013DB0004 (August 28, 2019)** unless notified by the Department.

The permittee must reapply for an authorization when the Department issues a General Permit that replaces 2013DB0004 if the permittee intends to continue operations and discharges from the facility.

SECTION 1 – RESPONSIBLE PARTY INFORMATION	
Issued to:	NCL (Bahamas) Ltd.

SECTION 2 – FACILITY INFORMATION	
ADEC File Number:	920.45.006
Authorization Number	*2013DB0004-0016*
Facility Name:	Norwegian Pearl
Type of Facility	Large Commercial Passenger Vessel
Type of Wastewater Authorized for Discharge:	Treated wastewater
Type of Wastewater Treatment System:	Scanship Mussell FA 45 2006
Type of Authorization:	Authorized for discharge of wastewater treated through a Scanship wastewater treatment system as approved by the Department in the current Vessel Specific Sampling Plan while underway at speeds greater than 6 knots. Authorization for discharge of wastewater treated through a Scanship wastewater treatment system while stationary or at speeds less than 6 knots.

SECTION 3 – REGULATED DISCHARGE INFORMATION – EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS	
Effluent Compliance Point:	Wastewater effluent sampling port(s) identified in the Department approved Vessel Specific Sampling Plan and Notice of Intent.
Effluent Limitations	Table 3 of the General Permit for discharges underway at speeds greater than 6 knots. Table 4 of the General Permit for discharges while stationary or at speeds less than 6 knots.
Special Conditions:	N/A
Monitoring Requirements	Tables 5 and 6 of the General Permit including Receiving Water Monitoring, and WET testing in 2017, and any other applicable monitoring requirements in the General Permit
Discharge Monitoring Report (DMR)	The Norwegian Pearl must submit a monthly DMR with effluent limits that is available on the Department's website: (http://dec.alaska.gov/water/cruise_ships/gp/2014gp.html) or on a similar form approved by the Department.

SECTION 4 – RECEIVING AREA INFORMATION-RECEIVING WATER	
Receiving Area Name:	Marine waters of the state of Alaska as defined in the General Permit
Underway Mixing Zone Description:	63 meters in length, 5 meters in width, and a depth from the water surface to the depth the discharge port is below the water surface plus one meter. The shape of the mixing zone is an elongated rectangle that extends from the discharge port towards the stern of the ship.
Stationary Mixing Zone Description:	Radius of 83 meters and a depth from the water surface to the depth the discharge port is below the water surface plus one meter. The mixing zone will extend away from the hull of the vessel in a semicircle centered on the discharge port.
Skagway Discharge at Ore or Broadway Docks	Radius of 15 meters and a depth from the water surface to the depth the discharge port is below the water surface plus one meter. The mixing zone will extend away from the hull of the vessel in a semicircle centered on the discharge port.

SECTION 5 – ADDITIONAL TERMS AND CONDITIONS (GP 4.3.2)	
N/A	None

If you have any technical questions regarding this authorization or the requirements of the general permit, please contact the Cruise Program Manager at (907) 465-5320.

SECTION 6 – CERTIFICATION/SIGNATURE

[Signature]
Signature

Date

Edward E White
Printed Name

EPS III, ADEC CPVEC
Title

Example 2: **Sample Vessel Specific Sampling Plan**

Vessel Specific Sampling Plan (VSSP) m.v. Example Rev1 2013 Season

Vessel Specific Sampling Plan Example Ship

The sampler will use the VSSP as a guide to identify the specific onboard locations to be sampled. To satisfy the VSSP requirement, you may fill in the blanks in this form starting on page 2 or you may submit an existing updated VSSP if it contains the components listed in 18 AAC 69.030(b).

Please note that ADEC will not approve sampling locations that are more than 50 feet from the overboard discharge port. Samples taken in 2003 indicate that samples taken directly after the ultraviolet disinfection unit were not of the same quality as samples taken at the overboard discharge pipe.

The two wastewater samples that are taken to satisfy the state requirements must reflect the quality of the effluent that is being discharged into Alaska waters during standard operating procedures. Only ships that discharge continuously may take the two samples for the state program. In port. vessels that have obtained continuous discharge certification from the U.S. Coast Guard but choose not to discharge in port as part of their standard operating procedures, must sample while the vessel is underway.

If you have questions concerning the components of the VSSP, please contact Albert Faure (907)-465-5279, or Ed White (907)-465-5138 or by email albert.faure@alaska.gov, edward.white@alaska.gov

Table on this page is for ADEC use only.

X	**ADEC approved as written on**	1/31/2013
☐	**ADEC approved with the redlined changes on**	/2013
☐	**ADEC does not approve, please resubmit**	/2013
The plan is missing or insufficient in the following areas: N/A		
2013 Revision 1: Updated water consumption estimates.		

Page 1 of 8

Vessel Specific Sampling Plan (VSSP) m.v. Example Rev1 2013 Season

Vessel Name: Example Ship
Facility Contact: Someone

(Note: Remember to include all units. Example cubic meters, gallons, cubic meters per second.)

Year ship joined fleet	2005
Gross tonnage	68,924
Passenger capacity(#)/voyage	1640
Crew capacity(#)/voyage	657
MSD system (USCG type)	Type II MSD Zenon installation. The Zenon system is an amalgamation of the ZenoGem and ZeeWeed technologies. The ZenoGem system consists of a suspended growth biological reactor. The ZeeWeed system is an ultrafiltration membrane system implemented using 120 ZeeWeed ZW-500C modules arranged in 12 cassettes. The system includes a final stage UV sterilization filter.
Number of MSD units	One Zenon installation consisting of two identical parallel processes. These processes are designated Train 2 and Train 4
Other water treatment units (type & capacity)	N/A
Black water treatment (type & capacity)	Zenon Environmental Inc. Advanced Black and Gray Water Treatment System consisting of the ZenoGem and ZeeWeed processes. The system includes a final stage UV sterilization filter. Total system capacity 710 m^3/day effluent from combined black and gray water influent.
Treated black water holding tank capacity & location (holding capacity includes double bottom tanks)	**Tank / Cap. (m3) / Location (Fr. No.)** 3 P(Biomass) 180 m^3 168-198 1 C(Permeate) 363 m^3 260-276 2P (Permeate) 133.2m^3 200-218 6P (Permeate) 96 m^3 48-68 6S (Permeate) 96 m^3 48-68 7C (Permeate) 305 m^3 8-33 13P (Permeate) 189.9m^3 232-248 13S (Permeate) 189.9m^3 232-248 17S (Permeate) 155.8m^3 200-222 16P (Permeate) 174.3m^3 100 - 134 4SB (Permeate) 180 m^3 100 - 130

Vessel Specific Sampling Plan (VSSP) m.v. Example Rev1 2013 Season

Gray water treatment (type & capacity)		Zenon Environmental Inc. Advanced Black and Gray Water Treatment System consisting of the ZenoGem and ZeeWeed processes. The system includes a final stage UV sterilization filter. Total system capacity 710 m^3/day effluent from combined black and gray water influent.
Gray water collection tank capacity & location		**Tank / Cap. (m3) / Location (Fr. No.)** 66P 21.9m^3 218-222 78P 7.2m^3 168-172 75S 14.7m^3 130-134 64P 85.0m^3 40-48 65C 80.6m^3 34-40 68P 31.8m^3 44-48 74P 12.5m^3 20-24 67S 13.6m^3 99-102 14P 90.1m^3 68-80
Gray water holding tanks capacity & location		**Tank / Cap. (m3) / Location (Fr. No.)** 3C 246 m^3 168-166 3S 179 m^3 168-198 5S 262 m^3 68-102 6P 96 m^3 48-68 6S 96 m^3 48-68
Mixed gray water/treated black water holding tank capacity & location		**Tank / Cap. (m3) / Location (Fr. No.)** Zenon Raw water tank 10m^3 156-160
Maximum discharge flow rate per discharge port [1] and discharge pump type		Permeate overboard pumps: 2x 22 m^3/hr Ballast overboard pump (Gray, Biomass, Permeate): 270m^3/hr Centrifugal Pumps
Average discharge flow rate per discharge port[1] and discharge pump type		Permeate pumps: 22m^3/hr Ballast pump: 270m^3/hr Type: Centrifugal Pumps
List of overboard discharge ports and location on vessel (Starboard/Port) & discharge line diameter and distance below/above waterline		Overboard "E": Permeate overboard: PS, 10 cm, 3m below the waterline Overboard "A": Stored Permeate/Grey Water/Biomass overboard: PS, 20 cm, 3m below the waterline
Black water generation per day		Average 40 m^3/day
Gray water generation per day	Accommodations	Average 315 m^3/day
	Galley	Average 80 m^3/day
	Laundry	Average 100 m^3/day
Daily water use/individual		83 gallons/person/day
Seawater usage per day		0 m^3/day
Peak water use per hour		Approx. 55 m^3/hr
Hours of peak water use		0700 – 0900 & 1130 – 1330 1630 – 21.30

[1] The pump(s) rate and discharge line diameter must be given to check the flow rate.

Page 3 of 8

Vessel Specific Sampling Plan (VSSP) m.v. Example Rev1 2013 Season

Wastewater Treatment

Waste Streams into the Zenon System

All gray water goes into holding tanks and from there on it is transported to the gray water collecting tanks 3 CN and 3 SB from there on the grey water pumps pump it to the Masko-Zoll filters and just before the filters gray and black water is mixed.
Black Water is pumped from the Evac units towards the Masko-Zoll filters.

1st Process – Solid Filters
This mixed stream of black & gray water is filtered in the Masko-Zoll screens and the screened water runs into tank-70. The plastics & other solids filtered from the black & gray water, produces a waste stream called *solid waste* that is stored in tank-72. This solid waste is landed ashore approximately every 4 weeks.

2nd Process – Biological
The biological process happens mainly in the bioreactor & partly in the membrane tank. This screened black & gray water (called screened raw water) is pumped out of tank-70 by the raw water pumps into the bioreactor, (previously tank 51P). The water in the bioreactor is now known as biomass. In the bioreactor the bacteria (bugs) eat the waste products and convert these into CO2, H2O and some other products plus heat. Therefore the biological process partly cleans up the biomass preparing it for the next process i.e. ultra filtration. It is necessary to waste biomass to keep the bacteria at the correct level. Biomass waste is transferred to 3 PS DB. It is legally regarded as untreated black water and therefore may only be pumped directly overboard when >12 NM from shore & not in a special area. Biomass wasting is a daily routine.

3rd Process - Ultra filtration
The biomass is pumped out from the bioreactor using the recirculation pumps and into the membrane tank, (previously tank 51P). It then overflows back into the bioreactor where it is subject to further biological process. Ultra filtration occurs in the membrane tank. Here permeate is drawn out of the biomass through the millions of microscopic pores in the membrane fibers (looks rather like hollow spaghetti) by means of the process/permeate pumps. These pumps create a very low vacuum inside the fibers of the membranes. The permeate is first used for filling up the back-pulse tanks. At 10 minute intervals this process reverses and permeate is taken out of the back-pulse tanks & is pumped back through the membranes. This is done to clean the pores in the membrane fibers.

4th Process – UV filter
Permeate that is not used in the back-pulse tanks then passes through a UV filter. The UV-unit is used as a final disinfection unit before the water is discharged overboard where allowed. Permeate used for other purposes e.g. technical water or black water dilution is directed from the permeate pump (pre-UV treatment) to a booster pump, then on to the technical water system or sewage collection tanks.

The Zenon system can process up to 600 tons of black/gray water every day.

Discharges

Prior to a vessel being certified for 24/7 discharge, permeate is held in vessel tanks for discharge outside of Alaska waters. Once a vessel is certified by the US Coast Guard and Alaska a vessel may discharge 24/7 of permeate, as long as its monthly samples continue to meet the Alaska effluent discharge standards. Permeate will not be discharged in Glacier Bay or Skagway, but held for discharge outside Alaska waters. If sample results are received that exceed the Alaska standards the permeate will be held in vessel tanks and discharged outside of Alaska waters and re-sampled at the next earliest location. Once sample results are received that are within the Alaska standards, the vessel will resume discharging permeate in Alaska waters. ADEC and U.S. Coast Guard will be advised of all sample results that do not meet the Alaska standards.

Wastewater Samples To Be Analyzed For Conventional Pollutants At Least Twice Per Season

The sampling port is located on C-deck, port side between frames 59 & 60, in the line between the ultraviolet irradiation unit and the hull penetration. The distance from the sample point to the overboard hull penetration is 3.5 meters (11.48 feet).

There is one other line connected to the discharge line that allows for the discharge of permeate while the ship is in dry-dock. This line runs to both the port and starboard side bunker breaks for discharge ashore. Except as noted above, the vessel will discharge wastewater continuously and not hold any wastewater. There is no pump on the discharge line. The pumps are upstream of the UV unit.

Wastewater Samples To Be Analyzed For Priority Pollutants Once Per Season

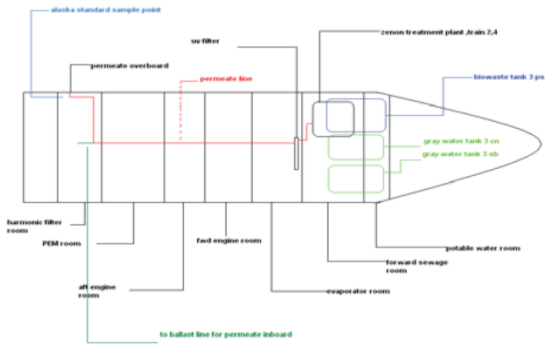
See description for conventional pollutants above.

Description of the standards the owner or operator will use to determine a deviation from the plan.

An Engineer dedicated to the maintenance and monitoring of the Zenon Advanced Waste Water Purification System conducts regular analysis of chemical oxygen demand, pH, total dissolved solids, total suspended solids, ammonia, phosphorus, turbidity of the permeate. These onboard tests along with the twice monthly sampling are used to evaluate the condition of the treatment system. If the treatment system indicates unacceptable variances in the operating parameters or is rendered not operational for any reason, permeate will be diverted to vessel tanks and held for discharge outside of Alaskan waters.

Attach sketch of vessel with treatment system, tanks, discharge pumps, discharge lines, sampling locations, and overboard ports.

A diagram of Example's Zenon system and tanks w/ tank capacities is included as an attachment to this plan.



Example Zenon Permeate Sample Point

Example Zenon Permeate Sample Point (close-up)

Regulated Conventional Pollutants

Wastewater	Sample Type	Parameters[2]	Bottles (preserved with)	Sample Location	Time & Dates Of ALL Appropriate Sample
Gray Water (GW) & Black Water (BW)	Grab	BOD, TSS, pH*, EC Alkalinity	1 liter HDPE	C-Deck, Port Side, between frames 59-60. 3.5 meters from the hull penetration.	Samples can be taken anywhere anytime after USCG continuous discharge approval. Without USCG approval samples may be taken while the ship is traveling a least 6 knots and 1 nm from shore, which occurs when the vessel is traveling between Seattle & Seattle
		Chlorine Residual*	From BOD, ASAP in field		
		COD, NH3, N2NO3 Total Phosphorus	250 ml HDPE (H_2SO_4)		
		TKN	500 ml HDPE (H_2SO_4)		
		Total Organic Carbon	2 40-ml VOC vials (H_2SO_4)		
		Settleable Solids	1 liter HDPE		
		Oil and grease	1 liter glass (H_2SO_4)		
		Fecal Coliforms	100 ml sterile plastic (Sodium Thiosulfate)		

**pH, free and total chlorine residuals will be field tested by the sampler while on the ship*

[2] Parameters will be finalized in the Quality Assurance/Quality Control Plan.

Priority Pollutants

Wastewater	Sample Type	Parameters[3]	Bottles (preserved with)	Sample Location	Time & Dates Of ALL Appropriate Sample
Gray Water (GW) & Black Water (BW)	Grab	BNA	1 L amber (unpreserved)	C-Deck, Port Side, between frames 59-60. 3.5 meters from the hull penetration.	Samples can be taken anywhere anytime after USCG continuous discharge approval. Without USCG approval samples may be taken while the ship is traveling a least 6 knots and 1 nm from shore, which occurs when the vessel is traveling between Seattle & Seattle.
		VOCs	40 mL VOA x2 (HCl)		
		Total Rec. Metals	500 mL poly (HNO3)		
		Dissolved Metals	500 mL poly (unpreserved)		

Locations to compare against discharge log entries:

Dock Locations:

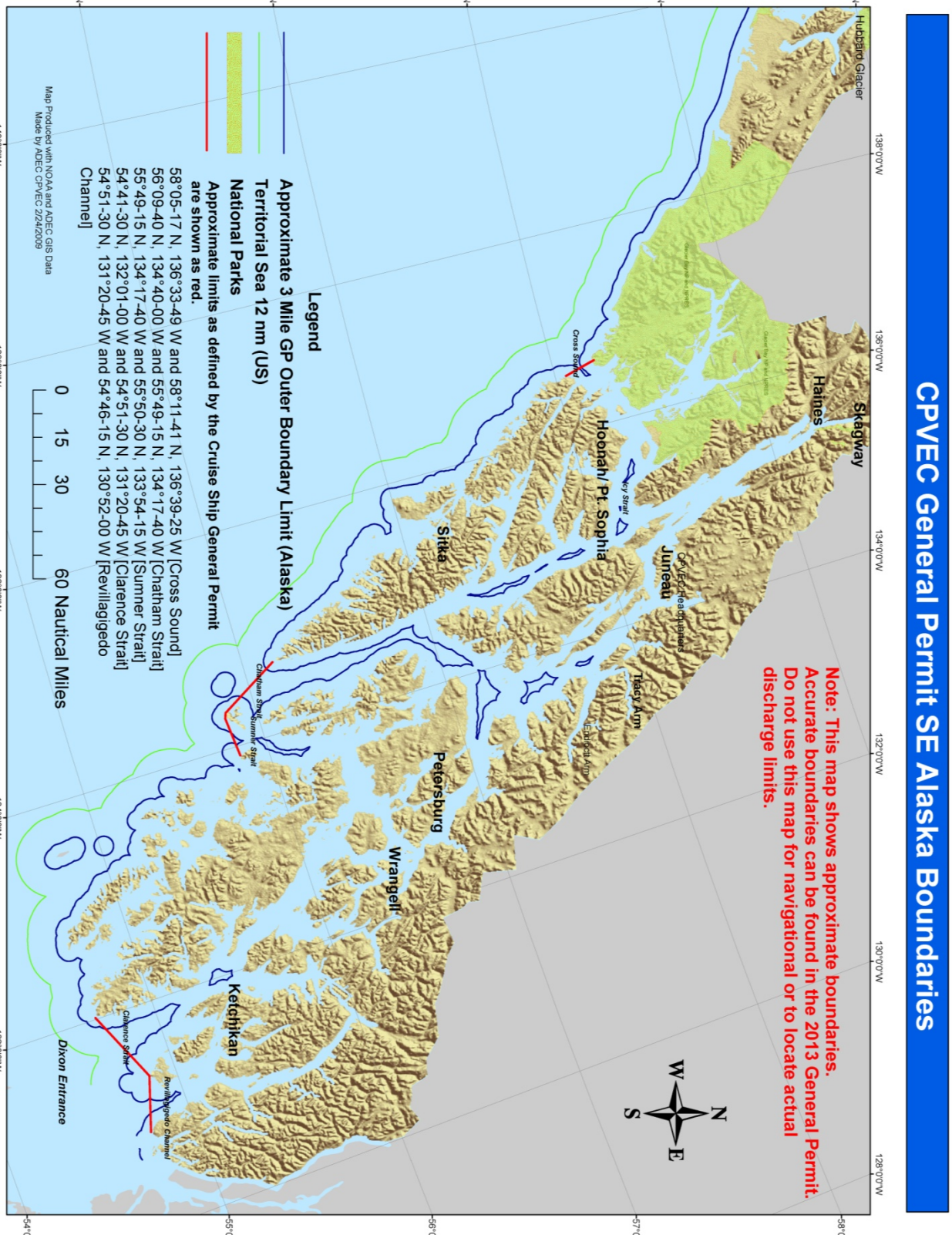
Port	Dock	Dock Location	Lat (N)	Long (W)
JNU	AIF	Anchor- Intermediate Float	58.28975	-134.39792
JNU	AJD	AJ Dock	58.28933	-134.39798
JNU	AMP	Anchor- Marine Park	58.2945	-134.40836
JNU	AS	Alaska Stream Dock	58.29867	-134.40564
JNU	CT	Cruise ship terminal	58.29545	-134.40068
JNU	FKL	South Franklin St Dock	58.29162	-134.39547
KTN	1	Dock 1 (salmon Landing)	55.3378	-131.64328
KTN	2	Dock 2 (Visitors Bureau)	55.34173	-131.64878
KTN	3	Dock 3 (City Float)	55.34202	-131.6498
KTN	AN3	Anchor (tender to berth 3)	55.342	-131.666
SIT	2BR	Anchor	57.01575	-135.35803
SIT	2CR	Anchor	57.03589	-135.30375
SIT	3CR	Anchor	57.98605	-136.96533
SKG	BRD	Broadway dock	59.44987	-135.32582
SKG	ORE	Ore Dock	59.45012	-135.3273
SKG	RRA	Railroad Dock Aft	59.44377	-135.32875
SKG	RRF	Railroad Dock Fore	59.44733	-135.32243
GB	N/A	Bartlett Cove Dock	58.4587	-135.8857
WHT		Whittier Cruise Dock	60.7783	-148.6942
SEW		Seward Cruise Dock	60.1180	-149.4281
KDK		Kodiak Ferry Dock	57.7868	-152.4029

Outer General Permit Boundaries (common entrances to SE Alaska):

58°05-17 N, 136°33-49 W and 58°11-41 N, 136°39-25 W [Cross Sound]
56°09-40 N, 134°40-00 W and 55°49-15 N, 134°17-40 W [Chatham Strait]
55°49-15 N, 134°17-40 W and 55°50-30 N, 133°54-15 W [Sumner Strait]
54°41-30 N, 132°01-00 W and 54°51-30 N, 131°20-45 W [Clarence Strait]
54°51-30 N, 131°20-45 W and 54°46-15 N, 130°52-00 W [Revillagigedo Channel]

Approximate- Glacier Bay "box":
North of 58.38° N and between 135.5° W and 137° W
Official Glacier Bay : *Glacier Bay* means all waters inside a line drawn between Point Gustavus at 135°54.927' W longitude; 58°22.748' N latitude and Point Carolus at 136°2.535' W longitude; 58°22.694' N latitude.

Other Locations:
Hinchinbrook Entrance (main entrance to Prince William Sound) 60.22 N, 146.82 W
Yakutat Bay entrance 59.58 N, 140.08 W
Tracy Arm entrance 57.75 N, 133.64 W
Forester Island (offshore of Prince of Wales Island) 54.8 N, 133.53W
Dixon Entrance Canadian Border (Canadian claim, not US approved) 54'40" N or 54.67 N


CPVEC General Permit SE Alaska Boundaries
Note: This map shows approximate boundaries.
Accurate boundaries can be found in the 2013 General Permit.
Do not use this map for navigational or to locate actual discharge limits.
Legend
Approximate 3 Mile GP Outer Boundary Limit (Alaska)
Territorial Sea 12 nm (US)
National Parks
Approximate limits as defined by the Cruise Ship General Permit are shown as red.
58°05-17 N, 136°33-49 W and 58°11-41 N, 136°39-25 W [Cross Sound]
56°09-40 N, 134°40-00 W and 55°49-15 N, 134°17-40 W [Chatham Strait]
55°49-15 N, 134°17-40 W and 55°50-30 N, 133°54-15 W [Sumner Strait]
54°41-30 N, 132°01-00 W and 54°51-30 N, 131°20-45 W [Clarence Strait]
54°51-30 N, 131°20-45 W and 54°46-15 N, 130°52-00 W [Revillagigedo Channel]
0 15 30 60 Nautical Miles
Map Produced with NOAA and ADEC GIS Data
Made by ADEC CPVEC 2/24/2009
Hubbard Glacier
Skagway
Haines
Hoonah/ Pt. Sophia
Cross Sound
Icy Strait
CPVEC Headquarters
Juneau
Tracy Arm
Endicott Arm
Sitka
Petersburg
Wrangell
Ketchikan
Chatham Strait
Sumner Strait
Clarence Strait
Revillagigedo Channel
Dixon Entrance
N
E
S
W
60°0'0"N
59°0'0"N
58°0'0"N
57°0'0"N
56°0'0"N
54°0'0"N
55°0'0"N
140°0'0"W
138°0'0"W
136°0'0"W
134°0'0"W
132°0'0"W
130°0'0"W
128°0'0"W

Section 2: Non-Hazardous (Solid) Wastes

General background:

Pollution by disposing of plastics and other prohibited wastes into Alaskan waters is prohibited. Since 2001 ship operators have been required to submit waste offloading plans to ADEC. This initial concern was a reaction to past activities by a few cruise ship operators. Today almost all documented cases of waste dumping overboard have been accidental or from passenger activities and has been limited in size. Cruise ships have implemented extensive waste minimizing (such as recycling), sorting, and storage procedures.

Common practices often include:

- Presorting (by the passengers or crew) of garbage in dedicated collecting bins. For example glass, food, metals (tin), plastics bottles.
- Collection of the garbage to sorting rooms
- Handling & storage of the garbage waste stream with a focus on reduction and re-use (on shore recycling) and removal of non-recyclable items and plastics/synthetics.
- Processing of the waste streams for storage, offload, or incineration of the waste.
- Waste is sorted and checked by dedicated crew members. Food waste is pulped and discharged outside Alaska or dewatered and incinerated. Paper, cardboard (that is not recycled), cartons, and other waste is incinerated by the onboard incinerator.
- Most garbage and hazardous waste is offloaded in Canada or Seattle. The offloading plans may include information on this.

All cruise ships must have a Nonhazardous Solid Waste Offloading Plan as required in 18 AAC 69.035. The NSWOP must describe:

1. an estimate of the volume of each waste type that the owner or operator anticipates offloading in this state or disposing into the marine waters of the state;
2. the proposed offloading or disposal method;
3. the name and address of each contractor to be used for offloading in this state or disposing into marine waters of the state; and
4. the harbors, landfills, or other offloading or disposal facilities in the state proposed to be used by the owner or operator or agent.

Ships can deviate from this plan, but must report deviations by November 15th. It is recommended to become familiar with the garbage logs, and waste offload plan if onboard for a voyage. These plans vary by company and sometimes by ship.

Figure 1- Waste Sorting Area

Table 1- Bureau of Transportation Statistics 2002 Estimates of Cruise Ship Waste Streams

Table 1
Summary of Cruise Ship Waste Streams

Type of waste	Estimated amount generated (typical one-week voyage)	Content/type	Notes
Sewage (blackwater)	210,000 gallons	Wasterwater and solids from toilets.	Can introduce disease-causing microorganisms and excessive nutrients to waterways.
Graywater	1 million gallons*	Wastewater from sinks, showers, galleys, laundrys. Contains detergents, cleaners, oil and grease, metals, pesticides, medical and dental wastes.	Has potential to cause adverse effects due concentration of nutrients and oxygen-demanding substances in waste stream.
Hazardous wastes	110 gallons	Photo chemicals.	Can contain silver, a toxic metal
	5 gallons	Drycleaning waste (perchloroethylene and other chlorinated solvents).	Perchloroethylene is a chemical that can cause neurotoxicity and kidney effects in humans.
	10 gallons	Used paint.	
	5 gallons	Expired chemicals, including pharmaceuticals.	
	Unknown	Other wastes, such as print shop wastes.	Can contain hydrocarbons, chlorinated hydrocarbons, and heavy metals that can be harmful to humans and aquatic species.
		Used fluorescent and light bulbs.	Contain small amounts of mercury, a toxic metal.
		Used batteries.	Contain heavy metals and acids.
Solid waste	8 tons	Plastic*, paper, wood, cardboard, food, cans, glass. *Under international regulations, the discharge of plastics is prohibited.	May be incinerated with ash discharged at sea; some solid wastes disposed or recycled on shore. Ash can contain hazardous wastes.
Oily bilge water	25,000 gallons	Liquid collected in the lowest point in the boat when the boat is in its static floating position.	Under international and U.S. regulations, ships are only allowed to discharge bilge waters containing less then 15 ppm of oil.

*NOTE: The interim Alaska report states that average cruise ship discharge is 200,000 gallons per day and that a large cruise ship may discharge as much as 350,000 gallons per day of treated blackwater and graywater.

SOURCES: Bluewater Network, Petition to U.S. EPA, Mar. 17, 2000; International Council of Cruise Lines, *Cruise Industry Waste Management Practices and Procedures*, May 14, 2001; U.S. Environmental Protection Agency, *Cruise Ship White Paper*, August 22, 2000

Example Cruise Lines Non-hazardous Solid Waste Offloading Plan (NSWOP) for Ship Name operating in Alaska State waters during 2016 (from May 18, 2016 to September 15, 2016)

NSWOP: Example Ship will not discharge any non-hazardous solid waste into the state of Alaska or in Alaskan waters. Non-hazardous solid waste will be offloaded in Seattle (Washington), Victoria and Vancouver (Canada) to locally licensed and approved solid waste vendors. The procedure for offloading non-hazardous solid waste is as follows:

1) Notification is made to the local port agent in advance, for the port where the waste is intended to be landed (as noted above).
2) Pre-approved vendor is notified in advance. The vendor arranges for transportation to designated waste facility for treatment, recycling or/and disposal as applicable.
3) Before offloading, the waste is labelled and packed as per company policy and local requirements.
4) After offloading, the vendor provides waste receipts and related documents.
5) The quantities of all waste offloaded is recorded in Garbage Record Book (GRB) as per MARPOL requirements and electronic database.

Example Cruise Lines Hazardous Waste and Substance Offloading Plan (HWSOP) for Example Ship operating in Alaska State waters during 2016 (from May 18, 2016 to September 15, 2016)

HWSOP: Example Ship will not offload any hazardous waste in the state of Alaska. Hazardous waste will be offloaded in Seattle (Washington) to locally licensed and approved waste vendors. All offloading is done in compliance with applicable USA and Canadian laws as applicable. The procedure for offloading hazardous waste is as follows:

1) Notification is made to the local port agent in advance, for the port where the hazardous waste is intended to be offloaded (as noted above).
2) Pre-approved vendor is notified in advance. The vendor arranges for transportation to designated waste facility for treatment, recycling or/and disposal as applicable.
3) Before offloading, the hazardous waste is labelled and packed as per company policy, federal and local requirements.
4) On the day of offloading the vendor boards the ship and puts required labels for transportation and provides hazardous waste manifests, receipts and related documents to the Environmental and Occupational Safety Officer (EOSO).
5) The EOSO onboard the ship, verifies that proper shipping and hazardous waste codes are recorded on the manifests and receipts as applicable.
6) The quantities of all hazardous waste offloaded are recorded in a dedicated Material Transfer sheet and electronic database.
7) Copies of the shipping papers and manifests are stored onboard the ship and in the Example Cruise Line office in Miami, USA.

Figure 2: Example Alaska Waste Offload Plan (NWSOP)

Subsection 1: Non-Hazardous Waste (Garbage) Daily

Job Aid Item: 2.1.a

Text: Garbage logs are up to date. Include in information section if garbage offload was conducted in Alaska IAW 18AAC 69.035 and 33 CFR 151.55(b-d)

Background: Annex V of MARPOL contains recordkeeping requirements. These recordkeeping requirements are listed under 33 CFR 151.55. An example log is included as Example 1 in this section after the list of checked items.

Figure 3- Waste Storage Cool Room

What to check: A garbage log is maintained and up-to-date. Check for any records of discharge of plastics overboard. Check for disposal of materials in areas prohibited, such as glass within 12nm. Also check the methodologies used to calculate or estimate the waste volume or weight.

Check the log entries against the solid waste offload plan to see if there are deviations. Deviations are allowed from the Alaska waste offload plan, but these deviations need to be submitted to ADEC by November 15th in a deviation report. Record offloads information in the information section of the daily report. This will allow ADEC to check if the volumes and facilities used match the waste plans and final deviation reports.

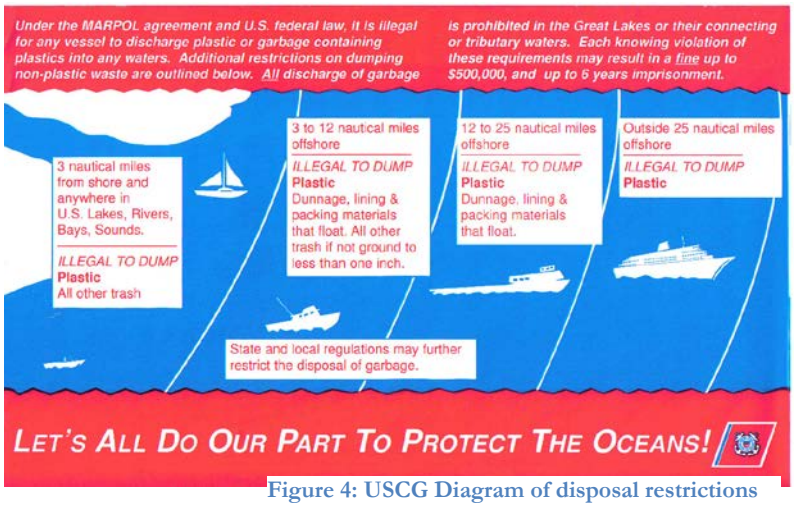


Figure 4: USCG Diagram of disposal restrictions

Citations: 33 CFR Sec. 151.55 Recordkeeping requirements.

(a) This section applies to the following:

(1) Every manned oceangoing ship (other than a fixed or floating platform) of 400 gross tons and above that is engaged in commerce and that is documented under the laws of the United States or numbered by a State.

(2) Every manned fixed or floating platform subject to the jurisdiction of the United States.

(3) Every manned ship that is certified to carry 15 passengers or more engaged in international voyages.

(b) The master or person in charge of each ship under paragraph (a)(1), (a)(2), or (a)(3) of this section shall ensure that a written record is maintained on the ship of each of the following garbage discharge or disposal operations:

(1) Discharge overboard.

(2) Discharge to another ship.

(3) Discharge to a reception facility.

(4) Incineration on the ship.

(c) The record under paragraph (b) of this section must contain the following information on each discharge or disposal operation:

(1) The type of operation as described under paragraphs (b)(1)through (b)(4) of this section.

(2) The date and time of the operation.

(3) If the operation was conducted at a port, the name of the port.

(4) If the operation was not conducted at a port, the latitude and longitude of the location where the operation was conducted and the estimated distance of that location from shore. If the operation involved off-loading to another ship, the identity of the receiving ship by name and official number.

(5) The amount of garbage involved, described by volume in cubic meters.

(6) For discharges into the sea, a description of the contents of the garbage, described by the following categories:

(i) Plastic material.

(ii) Floating dunnage, lining, or packing material.

(iii) Ground paper products, rags, glass, metal, bottles,crockery, or other similar garbage.

(iv) Unground paper products, rags, glass, metal, bottles,crockery, or other similar garbage.

(v) Victual wastes.

(vi) Incinerated ash.

(vii) Incinerated plastic residue.

(d) The record under paragraph (b) of this section must be prepared at the time of the operation, certified as correct by the master or person in charge of the ship, maintained on the ship for two years following the operation, and made available for inspection by the Coast Guard.

Job Aid Item: 2.1.b

Text: Garbage (if offloaded) was offloaded IAW Nonhazardous Solid Waste Plan (18 AAC 69.035)

Background: All cruise ships (over 50 passengers) are required to file a Nonhazardous Solid Waste Offloading and Disposal Plan (NSWOP). These plans must include offload estimates, methods used, names of ports used, and names of contractors. Although these plans can change, and operators can update information on a deviation report, it is important for ADEC to document deviations during the season.

What to check: Name and address of each contractor used for offloading matches waste offload plans. Adequate condition of the off load pallets and other carriers that would prevent loss of waste or spills. Review manifests and pickup arrangements. Check that offloads followed the NSWOP. Record offload information in the information section of the daily report. Check that there were no spills or dumping during offloads. Note deviations from the plan on the daily report.
Deviations are allowed from the Alaska waste offload plans, but these deviations need to be submitted to ADEC by November 15th in a deviation report. Record offloads information in the information section of the daily report. This will allow ADEC to check if the volumes and facilities used match the waste plans and final deviation reports. Occasionally vessels offload recyclables or donations in Alaska. Please include these in your daily report; these items could be disposed of if in poor condition.

Citation: 18 AAC 69.035. Nonhazardous solid waste offloading and disposal plan.

(a) As part of the plan required under AS 46.03.475(e)(1), that describes a vessel's policies and procedures for offloading in this state or disposing into the marine waters of the state of nonhazardous solid waste other than sewage, the owner or operator shall include, for each vessel that the owner or operator intends to operate, or cause or allow to operate,
(1) an estimate of the volume of each waste type that the owner or operator anticipates offloading in this state or disposing into the marine waters of the state;
(2) the proposed offloading or disposal method;
(3) the name and address of each contractor to be used for offloading in this state or disposing into marine waters of the state; and
(4) the harbors, landfills, or other offloading or disposal facilities in the state proposed to be used by the owner or operator or an agent of the owner or operator.

(b) A plan required under AS 46.03.475(e)(1) must be submitted on or before March 1 of each calendar year.
(Eff. 11/15/2002, Register 164)

Job Aid Item: 2.1.c

Text: Offload records are certified by the Master or person in charge of the vessel and are completed IAW 33 CFR 151.55 (d)

What to check: Waste offload was properly recorded.

Citation: 33 CFR 155.55 (d)

(d) The record under paragraph (b) of this section must be prepared at the time of the operation, certified as correct by the master or person in charge of the ship, maintained on the ship for two years following the operation, and made available for inspection by the Coast Guard.

Job Aid Item: 2.1.d

Text: Shipboard garbage is handled in accordance with Garbage (Waste) Management Plans. Review manifests and pick up schedule (33 CFR 151.57 (c))

Background: Garbage waste management plans must be in place to demonstrate that the vessel has a regime / procedures to handle the waste in large volumes. These plans are shared with the responsible persons for the waste handling on board. In the vessels plans itself are often include the planned off load ports (location) identified and the arrangements (contacts) to off load (dispose) the waste.

What to check: Garbage handling is in accordance with the vessels waste management plans including the collection and storage of waste. Check how are certain waste streams handled. Simple checks may be performed; for example-how is collection and storage done? Are off loads well-wrapped packages? Is there a risk that the waste can fall off from pallets or blown away? How is recycling performed (if included in the management plans)? Check for the "general shipping status of the waste". Documents such as shipping documents, manifests, and invoices are should include the location, volume, and type of waste. Content of waste in drums or closed containers should be checked.

Citations: 33 CFR 151.57 (c)

(c) Each waste management plan under paragraph (b) of this section must be in writing and—

(1) Provide for the discharge of garbage by means that meet Annex V of MARPOL 73/78, the Act, and §§151.51 through 151.77;

(2) Describe procedures for collecting, processing, storing, and discharging garbage; and

(3) Designate the person who is in charge of carrying out the plan.

Subsection 2: General Non-Hazardous Waste (Garbage)

Job Aid Item: 2.2.a

Text: Maintenance and repair conducted on equipment IAW 33 CFR 151.63 (b(3))

Background: This is another check for signs that garbage is not handled correctly or equipment failure is will not make is possible to handle the garbage according the plans or regulations.

What to check: Garbage handling equipment such as incinerators, grinders, etc. are operable. If equipment is not functioning check for extra stored wastes, and how these wastes are handled.

Citation: 33 CFR 151.63 (b)3

(3) The presence and operability of equipment to treat ship-generated garbage, including, but not limited to, incinerators, grinders, or comminuters.

Job Aid Item: 2.2.b

Text: Check there are no plastics or synthetics discharged overboard IAW 33 CFR 151.67

Background: Discharge of plastics is not allowed in any waters. Plastic items are often difficult to break down naturally and can impact wildlife. Garbage sorting crews often check the garbage for disposal of plastics. This includes plastic bottles, caps, wrappings, blister cards, and other plastics. Most vessels separate the garbage from plastics by using dedicated garbage cans; however plastic still may end up in the garbage stream.

Most garbage is sorted in dedicated spaces. Engine room or construction wastes can be handled separately. These wastes are also subject to the plastic prohibition. This includes ropes with synthetic materials, carpets, packaging, and canisters.

What to check: Wastes are sorted and plastics are removed if wastes are disposed of overboard.

Citations: 33 CFR 151.67 Operating requirements: Discharge of plastic prohibited.

No person on board any ship may discharge into the sea, or into the navigable waters of the United States, plastic or garbage mixed with plastic, including, but not limited to, synthetic ropes, synthetic fishing nets, and plastic garbage bags. All garbage containing plastics requiring disposal must be discharged ashore or incinerated. Definition of Plastics from 33 CFR 151: *Plastic* means any garbage that is solid material that contains as an essential ingredient one or more synthetic organic high polymers, and that is formed or shaped either during the manufacture of the polymer or polymers or during fabrication into a finished product by heat or pressure or both. "Degradable" plastics, which are composed of combinations of degradable starches and are either (a) synthetically produced or (b) naturally produced but harvested and adapted for use, are plastics under this part. Naturally produced plastics such as crabshells and other types of shells, which appear normally in the marine environment, are not plastics under this part.

Note: Plastics possess material properties ranging from hard and brittle to soft and elastic. Plastics are used for a variety of marine applications including, but not limited to: food wrappings, products for personal hygiene, packaging (vaporproof barriers, bottles, containers, and liners), ship construction (fiberglass and laminated structures, siding, piping insulation, flooring, carpets, fabrics, adhesives, and electrical and electronic components), disposable eating-utensils and cups (including styrene products), bags, sheeting, floats, synthetic fishing nets, monofilament fishing line, strapping bands, hardhats, and synthetic ropes and lines.

Job Aid Item: 2.2.c

Text: Trash chutes are clean and free from oil residue that could be lost overboard (No oil stains on decks, side of hull adjacent to trash chutes) IAW 40 CFR 110.3

Figure 5- Waste Chute Opening

Background: Oil discharge is prohibited. This includes oils unintentionally or intentionally discarded through a trash chute.

What to check: Overboard trash chutes for oil stains. Look for oil stains on side of ship when this is possible. Visually check for oil materials in the trash chutes for items such as oil filters, oil bottles, and gasket materials.

Tip: Some vessels do not use the garbage chute in their Northwest/Alaska operations or do not use them at all. Check that locking regimes and handling procedures are in place.

Citations: 40 CFR 110.3 Discharge of oil in such quantities as "may be harmful" pursuant to section 311(b)(4) of the Act.

For purposes of section 311(b)(4) of the Act, discharges of oil in such quantities that the Administrator has determined may be harmful to the public health or welfare or the environment of the United States include discharges of oil that:

(a) Violate applicable water quality standards; or

(b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

Figure 6- Food chute silo/chute

AS 46.03.740. Oil pollution.

A person may not discharge, cause to be discharged, or permit the discharge of petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or a residuary product of petroleum, into, or upon the waters or land of the state except in quantities, and at times and locations or under circumstances and conditions as the department may by regulation permit or where permitted under art. IV of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended.

Solid waste References:

Example 1: Garbage Record Book Example

COMMONWEALTH OF DOMINICA
MARITIME ADMINISTRATION

GARBAGE RECORD BOOK

NAME OF VESSEL: _____

IMO NUMBER: _____

DISTINCTIVE NUMBERS OR LETTERS: _____

PORT OF REGISTRY: _____

TYPE: _____
(SPECIFY)

COVERING THE PERIOD: FROM _____ **TO** _____

NOTE: Every ship of 400 tons gross tonnage and above and every ship which is certified carry 15 persons or more engaged in voyages to ports or offshore terminals under tl jurisdiction of other Parties to the Convention and every fixed and floating platform engaged exploration and exploitation of the sea-bed, shall be provided with a Garbage Record Book.

THIS ENTRY LOG MUST BE PRESERVED FOR THREE (3) YEARS FROM DATE OF LAST ENTR

CDP-603 (11.07)

1. INTRODUCTION
In accordance with Regulation 9 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), a record is to be kept of each discharge operation or completed incineration. This includes discharges at sea, to reception facilities, or to other ships.

2. GARBAGE AND GARBAGE MANAGEMENT
Garbage includes all kinds of food, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the vessel and liable to be disposed of continuously or periodically except those substances which are defined or listed in other annexes to MARPOL 73/78 (such as oil, sewage or noxious liquid substances).

The Guidelines for the Implementation of Annex V of MARPOL 73/78 should also be referred to for relevant information.

3. DESCRIPTION OF THE GARBAGE
The garbage is to be grouped into categories for the purposes of this record book as follows:

1. Plastics
2. Floating dunnage, lining, or packing material
3. Ground-down paper products, rags, glass, metal, bottles, crockery, etc.
4. Cargo residues, paper products, rags, glass, metal, bottles, crockery, etc.
5. Food waste
6. Incinerator ash

4. ENTRIES IN THE GARBAGE RECORD BOOK

1. Entries in the Garbage Record Book shall be made on each of the following occasions:

(a) When garbage is discharged into the sea:
(i) Date and time of discharge
(ii) Position of the ship (latitude and longitude). Note: for cargo residue discharges, include discharge start and stop positions
(iii) Category of garbage discharged
(iv) Estimated amount discharged for each category in m^3
(v) Signature of the officer in charge of the operation.

(b) When garbage is discharged to reception facilities ashore or to other ships:
(i) Date and time of discharge
(ii) Port or facility, or name of ship
(iii) Category of garbage discharged
(iv) Estimated amount discharged for each category in m^3
(v) Signature of officer in charge of the operation.

(c) When garbage is incinerated:
(i) Date and time of start and stop of incineration
(ii) Position of the ship (latitude and longitude)
(iii) Estimated amount incinerated in m^3
(iv) Signature of the officer in charge of the operation.

(d) Accidental or other exceptional discharges of garbage
(i) Time of occurrence
(ii) Port or position of the ship at time of occurrence
(iii) Estimated amount and category of garbage
(iv) Circumstances of disposal, escape or loss, the reason therefore and general remarks.

2. Receipts
The master should obtain from the operator of port reception facilities, or from the master of the ship receiving the garbage, a receipt or certificate specifying the estimated amount of garbage transferred. The receipts or certificates must be kept on board the ship with the Garbage Record Book for two years.

3. Amount of garbage
The amount of garbage onboard should be estimated in m^3, if possible separately according to category. The Garbage Record Book contains many references to estimated amount of garbage. It is recognized that the accuracy of estimating amounts of garbage is left to interpretation. Volume estimates will differ before and after processing. Some processing procedures may not allow for a usable estimate of volume, e.g. the continuous processing of food waste. Such factors should be taken into consideration when making and interpreting entries made in a record.

RECORD OF GARBAGE DISCHARGES

Name of Ship	Distinctive Numbers or Letters:	IMO No.

Garbage Categories:
1. Plastic.
2. Floating dunnage, lining, or packing materials.
3. Ground paper products, rags, glass, metal, bottles, crockery, etc.
4. Cargo residues, paper products, rags, glass, metal, bottles, crockery, etc.
5. Food waste.
6. Incinerator ash except from plastic products which may contain toxic or heavy metal residues.

NOTE: The discharge of any garbage other than food waste is prohibited in special areas*.
Only garbage discharged into the sea must be categorized. Garbage other than category 1 discharged to a reception facility need only be listed as a total estimated amount. Discharges of cargo residues require start and stop positions to be recorded.

Date/Time	Position of Ship	Estimated amount discharged into the sea (m^3)					Estimated amount discharged to reception facilities or to other ship (m^3)		Estimated amount incinerated (m^3)	Certification / Signature
		Cat. 2	Cat. 3	Cat. 4	Cat. 5	Cat. 6	Cat. 1	Other		

*Special areas under Annex V of Marpol 73/78 are: the Mediterranean Sea area, the Baltic Sea area, the Black Sea area, the Red Sea area, the "Gulfs" area, the North Sea area, the Arctic area, the wider Caribbean Region – including the Gulf of Mexico and the Caribbean Sea.

Master's Signature	Date

Section 3: Hazardous Materials and Wastes

General background:

As defined in state law "hazardous waste" means a waste or combination of wastes that because of quantity, concentration, or physical, chemical, or infectious characteristics may

(A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or

(B) pose a substantial present or potential hazard to human health or the environment when improperly managed, treated, stored, transported, or disposed of.

Hazardous materials are substances or materials that could pose a safety risk or environmental damage risk unless properly stored and handled.

The hazardous materials and wastes section contains checks both for environmental hazards as well as safety hazards caused by hazardous materials.

Note: be aware that some wastes are only considered hazardous if stored or disposed of in large quantities.

2009 Hazardous Waste and Substance Offloading Plan (HWSOP)

1. Estimate of waste volumes to be discharged ashore in Alaska: NONE.

2. Offloading Method: Not applicable as there will be no offloading in Alaska. For information, liquid/sludge wastes are offloaded in sealed plastic containers or cans typically 1 to 6 gallons capacity with appropriate labeling. Dry wastes such as batteries are packaged in an appropriate container or handled individually for larger lead-acid type. The vessel's side ports, port & starboard aft, are utilized along with a hydraulically operated platform that can lift and extend over the pier to transfer goods from ship to shore where they can be accessed by forklift or by hand.

3. Material Safety Data sheets: Not applicable as no hazardous wastes will be landed. MSDS's are maintained onboard the ship for all hazardous products used.

4. Contractors: Not applicable. For the 2009 Alaska season, contractors in Vancouver and Victoria B.C. will be used.

5. Disposal Facility: Not applicable. Facilities in Canada will be used.

6. Staff Training in Offloading procedures: Not applicable. No offloading in Alaska. For information, waste handling personnel have received training onboard the ship in the following handling procedures: All hazardous wastes generated within the ship must collected in an appropriate container and labeled at the source. It is then listed on an internal waste transfer manifest before being transferred to the Garbage Room where they are segregated in separate lockers under control of the Marine Stores Manager who confirms that a proper container and labeling have been used. A waste manifest is prepared before the port call and sent to the ship's port agent to arrange for appropriate contractors and to confirm the wastes can be handled. The contractor receiving the waste is required to sign for the wastes on the ship's manifest in addition to any other that may be required for the state/country where it being landed.

6. For additional information regarding hazardous waste policy and procedures please see attached document

Figure 1- Comprehensive Haz Waste Plan example submitted to ADEC

General Citations:

AS 46.03.296. Disposal of hazardous wastes.

(a) It is unlawful to dispose of hazardous wastes in the state unless

(1) the waste has been treated and disposed of in a manner that uses the maximum degree of reduction of the harmful qualities of a hazardous waste that is subject to this chapter and that the department, on a case-by-case basis, determines is achievable for the hazardous waste by application of production processes and available methods, systems, and techniques, taking into account energy, environmental, and economic impacts and other costs; and

(2) the waste is disposed of in a manner that will ensure the protection of human health, livestock, wildlife, property, and the environment.

(b) The department shall adopt regulations in accordance with AS 44.62 (Administrative Procedure Act) for the treatment, storage, and disposal of hazardous wastes to ensure the protection of human health, livestock, wildlife, property, and the environment.

AS 46.03.710. Pollution prohibited.

A person may not pollute or add to the pollution of the air, land, subsurface land, or water of the state.

AS 46.03.745. Hazardous substance release.

Except for a controlled release, the reporting of which is the subject of an agreement with the commissioner under AS 46.09.010 (b), a person may not cause or permit the release of a hazardous substance as defined in AS 46.09.900.

Statute Definitions (46.03.900):

(9) "hazardous waste" means a waste or combination of wastes that because of quantity, concentration, or physical, chemical, or infectious characteristics may

(A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or

(B) pose a substantial present or potential hazard to human health or the environment when improperly managed, treated, stored, transported, or disposed of;

(20) "pollution" means the contamination or altering of waters, land, or subsurface land of the state in a manner which creates a nuisance or makes waters, land, or subsurface land unclean, or noxious, or impure, or unfit so that they are actually or potentially harmful or detrimental or injurious to public health, safety, or welfare, to domestic, commercial, industrial, or recreational use, or to livestock, wild animals, bird, fish, or other aquatic life;

18 AAC 69.040. Hazardous waste and hazardous substance offloading plan.

(a) As part of the plan required under AS 46.03.475(e)(2), that describes a vessel's policies and procedures for offloading of hazardous waste or a hazardous substance from a vessel while that vessel is operating in the marine waters of the state, and to the extent that the offloading is not covered by a report or notice submitted under AS 46.03.475(d), the owner or operator shall include, for each vessel that the owner or operator intends to operate, or cause or allow to operate, and for each hazardous waste or hazardous substance anticipated to be offloaded,

(1) an estimate of the volume and type of each waste or substance;

(2) the proposed offloading method;

(3) material safety information provided by the manufacturer, if applicable;

(4) the name and address of each contractor to be used for offloading;

(5) the controlled storage, processing, or disposal facilities or treatment works proposed to be used; and

(6) a description of vessel crew training in offloading procedures.

(b) A plan required under AS 46.03.475(e)(2) must be submitted on or before March 1 of each calendar year.

AS 46.03.475 Reporting Requirements

(d) If the owner or operator of a commercial passenger vessel operating in the marine waters of the state is required by the laws of the United States or by the laws of Canada or of a province or territory of Canada to file a report or provide notice of a discharge or offloading of a hazardous waste, as defined in AS 46.03.900 , or of a hazardous substance, as defined in AS 46.03.826 , that was generated, discharged, or offloaded while the vessel was operating in the marine waters of the state, the owner or

operator shall submit to the department a copy of the report or notice within 21 days after having provided the report or notice to an agency of the government of the United States or to an agency of the government of Canada or of a province or territory of Canada.

33 CFR 151.55 Recordkeeping requirements.

(a) This section applies to the following:

(1) Every manned oceangoing ship (other than a fixed or floating platform) of 400 gross tons and above that is engaged in commerce and that is documented under the laws of the United States or numbered by a State.

(2) Every manned fixed or floating platform subject to the jurisdiction of the United States.

(3) Every manned ship that is certified to carry 15 passengers or more engaged in international voyages.

(b) The master or person in charge of each ship under paragraph (a)(1), (a)(2), or (a)(3) of this section shall ensure that a written record is maintained on the ship of each of the following garbage discharge or disposal operations:

(1) Discharge overboard.

(2) Discharge to another ship.

(3) Discharge to a reception facility.

(4) Incineration on the ship.

(c) The record under paragraph (b) of this section must contain the following information on each discharge or disposal operation:

(1) The type of operation as described under paragraphs (b)(1) through (b)(4) of this section.

(2) The date and time of the operation.

(3) If the operation was conducted at a port, the name of the port.

(4) If the operation was not conducted at a port, the latitude and longitude of the location where the operation was conducted and the estimated distance of that location from shore. If the operation involved off-loading to another ship, the identity of the receiving ship by name and official number.

(5) The amount of garbage involved, described by volume in cubic meters.

(6) For discharges into the sea, a description of the contents of the garbage, described by the following categories:

(i) Plastic material.

(ii) Floating dunnage, lining, or packing material.

(iii) Ground paper products, rags, glass, metal, bottles, crockery, or other similar garbage.

(iv) Unground paper products, rags, glass, metal, bottles, crockery, or other similar garbage.

(v) Victual wastes.

(vi) Incinerated ash.

(vii) Incinerated plastic residue.

(d) The record under paragraph (b) of this section must be prepared at the time of the operation, certified as correct by the master or person in charge of the ship, maintained on the ship for two years following the operation, and made available for inspection by the Coast Guard.

33 CFR 151.57 Waste management plans.

(a) This section applies to the following:

(1) Each manned oceangoing ship (other than a fixed or floating platform) of 40 feet or more in length that is documented under the laws of the United States or numbered by a state and that either is engaged in commerce or is equipped with a galley and berthing.

(2) Each manned fixed or floating platform that is—

(i) Documented under the laws of the United States; or

(ii) Operating under the authority of the United States, including, but not limited to, a lease or permit issued by an agency of the United States.

(b) The master or person in charge of a ship under paragraphs (a)(1) and (a)(2) of this section shall ensure that the ship is not operated unless a waste management plan meeting paragraph (c) of this section is on the ship and that each person handling garbage follows the plan.

(c) Each waste management plan under paragraph (b) of this section must be in writing and—

(1) Provide for the discharge of garbage by means that meet Annex V of MARPOL 73/78, the Act, and §§151.51 through 151.77;

(2) Describe procedures for collecting, processing, storing, and discharging garbage; and

(3) Designate the person who is in charge of carrying out the plan.

33 CFR 151.63 Shipboard control of garbage.

(a) The master, operator, or person who is in charge of a ship shall ensure that all garbage is discharged ashore or in accordance with §§151.66–151.73.

(b) The following factors, among others, may be considered by enforcement personnel in evaluating compliance with §§151.51 through 151.77:

(1) Records, including receipts, of garbage discharges at port reception facilities.

(2) Records under §151.55 or log entries of garbage discharges.

(3) The presence and operability of equipment to treat ship-generated garbage, including, but not limited to, incinerators, grinders, or comminuters.

(4) The presence of and adherence to a written shipboard waste management plan.

(5) The absence of plastics in ship stores.

(6) Ongoing educational programs to train shipboard personnel of garbage handling procedures and the need for these.

(7) The presence of shipboard spaces used for collecting, processing, storing and discharging ship-generated garbage.

(c) The master, operator, or person who is in charge of a ship shall ensure that if garbage is transported from a ship by shipboard personnel, it is properly deposited into a port or terminal's reception facility.

33 CFR 151.67 Operating requirements: Discharge of plastic prohibited.

No person on board any ship may discharge into the sea, or into the navigable waters of the United States, plastic or garbage mixed with plastic, including, but not limited to, synthetic ropes, synthetic fishing nets, and plastic garbage bags. All garbage containing plastics requiring disposal must be discharged ashore or incinerated.

40 CFR 262.34 Accumulation time.

(a) Except as provided in paragraphs (d), (e), and (f) of this section, a generator may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, provided that:

(1) The waste is placed:

(i) In containers and the generator complies with the applicable requirements of subparts I, AA, BB, and CC of 40 CFR part 265; and/or

(ii) In tanks and the generator complies with the applicable requirements of subparts J, AA, BB, and CC of 40 CFR part 265 except

Sec. Sec. 265.197(c) and 265.200; and/or

(iii) On drip pads and the generator complies with subpart W of 40

CFR part 265 and maintains the following records at the facility:

(A) A description of procedures that will be followed to ensure that all wastes are removed from the drip pad and associated collection system at least once every 90 days; and

(B) Documentation of each waste removal, including the quantity of waste removed from the drip pad and the sump or collection system and the date and time of removal; and/or

(iv) The waste is placed in containment buildings and the generator complies with subpart DD of 40 CFR part 265, has placed its professional engineer certification that the building complies with the design standards specified in 40 CFR 265.1101 in the facility's operating record no later than 60 days after the date of initial operation of the unit. After February 18, 1993, PE certification will be required prior to operation of the unit. The owner or operator shall maintain the following records at the facility:

(A) A written description of procedures to ensure that each waste volume remains in the unit for no more than 90 days, a written description of the waste generation and management practices for the facility showing that they are consistent with respecting the 90 day limit, and documentation that the procedures are complied with; or
(B) Documentation that the unit is emptied at least once every 90 days.

Sub-section 1: Hazardous Materials and Wastes Daily

Note- for citations see the general citations above.

Job Aid Item: 3.1.a

Text: Vessel hazardous waste logs are up to date IAW 33 CFR 151.55(b) and (d). Include in information section 4

Background: Offloads of hazardous waste must be recorded. This can be done in a garbage record book or a log of hazardous waste offloads. Often manifests are available to confirm from the recovered what was offloaded and the amount. Offloads of hazardous waste in Alaska are rare. Please note that some vessels do off load mattresses or other useful items for the communities in Alaska (donations). This is not hazardous waste, but often reported by the vessels to avoid confusion. Include these off loads in the information section of the daily report.

What to check: Waste offloads are logged in either a garbage record book or a hazardous waste log. Check that entries are complete and entered in a timely manner. If offloads occur include in the information section of the daily report.

Job Aid Item: 3.1.b

Text: Hazardous waste was offloaded IAW the Alaska Hazardous Waste Offloading Plan, and volumes and waste types match the plan IAW 18 AAC 69.040

Background: Offloads of hazardous waste in Alaska are rare. When done, it needs to match the Hazardous Waste Offloading Plan submitted by the operator to DEC. Please note that some vessels do off load mattresses or other useful items for the communities in Alaska (donations). This is not hazardous waste, but often reported by the vessels to avoid confusion. Include these off loads in the information section of the daily report.

What to check: Waste offloads are done according to the operators Hazardous Waste Offloading Plan. If offloads occur, volumes need to be entered in information section of daily report.

Job Aid Item: 3.1.c

Text: Records reflect reasonable accumulations of waste with respect to the capacity of the vessel, its age, technologies onboard, and amounts of repair /maintenance IAW AS 46.03.296 and AS 46.03.745

Figure 2: Container of hazardous waste

Background: For most potential hazardous waste streams cruise ships do not generate large industrial scale quantities, so it is common that waste is allowed to accumulate until a reasonable quantity exists to offload. For example it could be stored until a drum ('Unit") is filled. If there is a waste stream there should be either an accumulation onboard or a record of it being properly disposed of. One way to check this is to look at what an average voyage would generate, and then

compare that with accumulation or offloads. For example, a stream of 100 liters a week should have about a 55 gallon drum every two weeks. [Approximately 1 US gallon is 3.74 liters]

What to check: Check offload records to see entries that show offload of waste, or that waste is accumulated onboard for eventual disposal. For example, if traditional photo processing is done onboard during a voyage there should be some photo waste from the voyage or previous voyages onboard. In general do the off load records volumes and weights make "sense"? Note sometimes vessel do have "one time" large volume offload, for example used lube oil / hydraulic oil. This is especially the case when major repairs / overhauls are performed.

Sub-section 2: General Hazardous Materials and Wastes

Note- for citations see the general citations above.

Job Aid Item: 3.2.a

Text: Records are maintained and manifests completed for potential hazardous material and waste streams IAW 18 AAC 69.040

Background: Most cruise ship do not offload hazardous waste in Alaska. If they do they need to document the offloads either in their waste offload plans or in deviation reports submitted at the end of each cruise season.

What to check: If cruise ships offload hazardous waste in Alaska, check that manifest and records are completed for each offload. Record the offload data in the information sections so that ADEC can check against final deviation report.

Job Aid Item: 3.2.b

Text: Shipboard garbage is properly handled all in accordance with Hazardous Material Management Plan. Review manifests and pick up schedule. (33 CFR 151.57)

Background: Garbage and hazardous wastes and materials should be handled properly and hazardous substances should not enter the garbage waste stream.

What to check: Procedures in onboard waste plans are followed, and that the agreed upon handling including loading (pick up) is according the plans.

Job Aid Item: 3.2.c

Text: Check if there is any evidence of hazardous material being discharged overboard (AS46.03.296 & 46.03.745)

Background: It is illegal to dispose of hazardous waste to water without proper treatment.

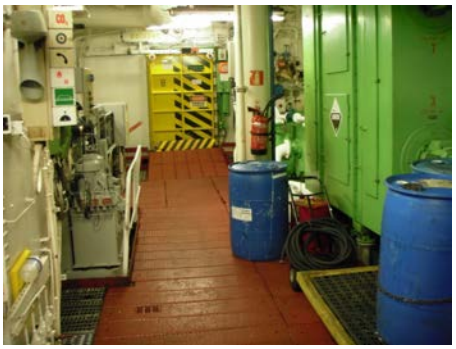
What to check: Hoses, unusual connections, materials that disappear. Check for unusual activities or sheens near the ship. Unusual activities could include fish and other wildlife leaving area or leaping out of water (although this is a common activity for salmon). Hazmat materials / containers in the neighborhood of the overboard chutes (if present / used).

Figure 3 Mystery sheen near ship

Figure 4- Hose was checked, no connection to stored wastes Note: the open floor plate (safety item)

Figure 5- Chemical properly stored in a containment basin

Figure 6- Check for leaking storage units, unusual hoses or drains, etc.



Job Aid Item: 3.2.d

Text: Storage handling of hazardous materials and waste is IAW AS 46.03.296, AS 46.03.745 and 40 CFR 262.34

Background: Disposal of hazardous waste is not allowed. This includes accidental disposal caused by negligent storage.

What to check: Stored products could not easily be blown, washed, or drain away. Clear labeling of the packaging to avoid accidental "mix ups".

Figure 8: Waste Collection

Figure 7: Waste Collection

Job Aid Item: 3.2.e

Text: The following (if applicable) hazardous materials and waste streams are properly handled and disposed of IAW AS 46.03.745, AS 46.03.296, and 40 CFR 273

i. Photo processing (VGP 1.2.3.5)
ii. X-ray equipment waste
iii. Print shop waste (inks, etchers, developers etc.)
iv. Paints, solvents, thinners;
v. Fluorescent or mercury vapor bulbs;
vi. Dry cleaning chemicals and wastes (e.g. PERC, Tri, lint condensate water, etc.) (if applicable)
vii. Batteries (universal wastes).
viii. Pharmaceuticals / narcotics
ix. Cleaning chemicals (including evaporator cleaning, electro cleaner)
x. Pyrotechnics (expired)
xi. Oily and or chemically contaminated rags, filters etc.
xii. Incinerator wastes (ashes)
xiii. Pesticides / rodent control chemicals
xiv. AWTS chemicals (such as de-scalers)
xv. Undiluted barbercide
xvi. Exhaust gas scrubber particulate sludge or slurries or filtered solids

Figure 9-Silver recovery from photo wastes

Figure 10 X-ray development wastes

Background: Cruise ships have procedures and methods for sorting and handling waste. It is useful to become familiar with these procedures. For several of these items a small amount of waste into the wastewater system is acceptable. For example a small amount of barbercide when diluted with water. Information on disposal can often be found in the labeling of the product, the MSDS, or other documentation onboard. ADEC will be providing some electronic lists of hazardous constituents from the EPA.

What to check: Waste streams listed are not disposed of in the wastewater system (including accidentally drained), into the garbage stream, the bilge, or potentially overboard. Used batteries are not mixed with other wastes and should be kept dry

Figure 11: Chemical storage reference chart onboard

Job Aid Item: 3.2.f

Text: Maintenance and repair conducted on equipment involved in Hazardous Materials handling IAW 33 CFR 151.63 (b(3))

Background: Equipment needs regular maintenance and repairs. Equipment not functioning well should not be used when handling potentially hazardous materials.

What to check: Equipment being used to store, transport, or process wastes are in working order.

Section 4: Visible Emissions, Air Quality

General background:

All marine vessels must comply with the air emission standard found at 18 ACC 50.070 while they operate in Alaska waters. Alaska is one of the few states that has regulations that include opacity (visible emissions from marine vessels. These regulations apply to all vessels regardless of size or type. The standard requires that visible emissions (opacity) from vessel smoke stacks be no greater than 20% opacity for three minutes while docked or anchored. There are exemptions on the "three minutes rule" while the vessel is maneuvering to or from anchor or port and for startup prior to departure.

Figure 1: Low opacity from stack

ADEC has been monitoring emissions from marine vessels since at least 1994. The Cruise Ship Program (CPVEC) took over monitoring of cruise ships under 46.03.488, while ADEC Division of Air monitors and enforces on violations for other marine vessels.

ADEC uses opacity as a regulatory limit for marine vessel emissions[1] (and emissions from many shore side emitters). EPA method 9 is used to determine opacity by visual means. CPVEC staff and an opacity contractor take Method 9 readings in all major Alaskan cruise ports, as well as some of the other Alaskan ports. In addition, the US Forest Service monitors opacity in Tracy Arm and the National Park Service monitors opacity in Glacier Bay and other National Parks. In Glacier Bay National Park there is also a federal opacity regulation (36 CFR 13.65 (b) (4)) which is similar to the Alaska regulations.

ADEC and its opacity contractor take Method 9 readings of large and small cruise ships and ferries in several Alaska ports. CPVEC also receives public complaints regarding cruise ships and ferries. CPVEC also received self-reports of excess emissions (under 18 AAC 50.240) from cruise ships. Ships are required to self-report to ADEC opacity exceedances. Forms and information can be found on the CPVEC website.

Ocean Rangers are not trained to perform opacity readings but have contributed significantly to the cruise programs opacity monitoring by reporting cases of heavy smoke, soot, and equipment failures. They have also documented many operators effectively and successfully minimizing emissions to meet the opacity limits. Continued reporting is still a critical element for the cruise ship program.

Opacity is a surrogate for air pollution. There are many types of air pollution, such as oxides of nitrogen, sulfur, and carbon, particulates, volatile organic components, and carcinogens. While it would be more difficult to measure all of these parameters, visible opacity is commonly used for compliance measurements as an indicator and type of air pollution. Opacity is the reduction of

[1] Emissions from combustion source may include NOx, Sox, PM, VOC etc. emissions in the context of opacity is visible emissions.

transmitted light caused by particles, mists, or gases. It can be caused by partially burned fuel or ash from the combustion processes.

Opacity was originally measured using the Ringelmann scale which used grids to compare to the opacity of the smoke. It only worked well with black smoke, and was replaced with EPA Method 9. The Ringelmann method introduced the 20% limit, which was based on increasing the efficiency of combustion. The idea was that over 20% would show incomplete combustion.

Method 9 is a visual method that requires training and certification. The method contains requirements that are designed to reduce potential bias. Because of the requirements for angles and distances from the stack it would be difficult to have Ocean Rangers perform opacity readings onboard. More information on opacity readings can be found in the reference part of this section.

Subsection 1: Opacity (Visible Emissions); Air Quality

Job Aid Item: 4.1.a

Text: Stack emissions are minimized and monitored. Operational (combustion) procedures in place IAW 18 AAC 50.070

Background: Cruise Ships in Alaska often monitor air emissions using opacity meters (Continuous Opacity Monitoring System (COMS)) and with visual checks by video camera located on the stack or in person. Most ships have procedures on keeping emissions below the regulatory limit.

Figure 2: Opacity meter

Figure 4: High opacity apparently cause by fuel issues

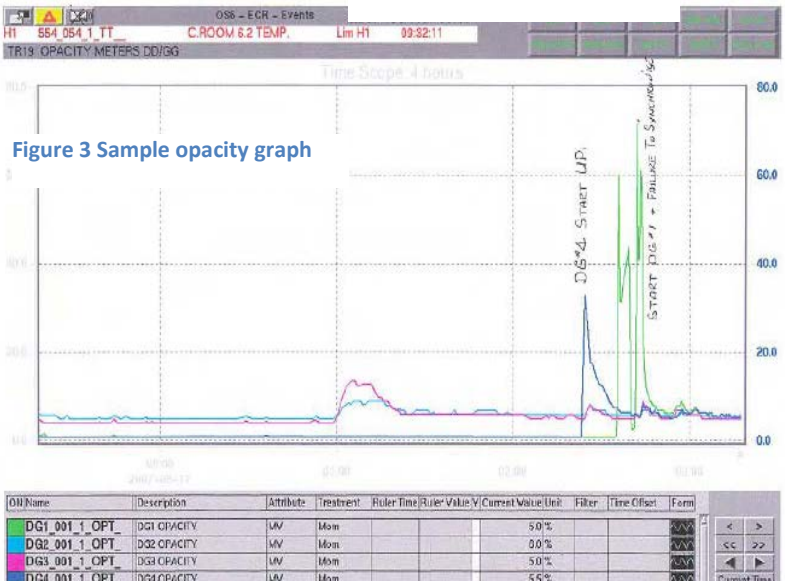


Figure 3 Sample opacity graph

Please note that opacity meters can be useful onboard, but may not match the visible opacity as there are many factors including calibration, equipment error, and levels alarms are set at.

What to check: Procedures are in place to monitor opacity emissions and limit

visible emissions over the state regulatory limit.

ADEC marine vessel opacity regulations apply to all stacks from all combustion sources installed on board of the vessel. This includes boilers, incinerators, dryers, diesel engines, gas turbines etc. Often factors or combinations of factors with regard to operational practices, poor fuel treatment, poor fuel quality and not well-maintained equipment are possible elements for opacity exceedances.

Short summary of allowances above the opacity limit:

1) Over 20% for more than 3 minutes in any hour in any operating mode
2) Over 20% for any 6 minutes in an hour during startup while preparing to depart
3) For the hour after casting off or weighing anchor either
    a. 40% limit for that hour or
    b. Up to 9 minutes over 20%
4) For the hour prior to casting off or weighing anchor either
    a. 40% limit for that hour or
    b. Up to 9 minutes over 20%

►*Tip: Multiple opacity events have occurred on the same day. Document clearly the location, date, and times of the event. A picture of the record is recommended.*

Citations: 18 AAC 50.070. Marine vessel visible emission standards.

Within three miles of the Alaska coastline, visible emissions, excluding condensed water vapor, may not reduce visibility through the exhaust effluent of a marine vessel by more than 20 percent except as follows:

(1) while at berth or at anchor, visibility may be reduced by up to 100 percent for periods aggregating no more than

(A) three minutes in any one hour; and

(B) an additional three minutes during initial startup of a vessel; for purposes of this subparagraph, "initial startup" includes the period during which a vessel is testing equipment in preparation to casting off or weighing anchor;

(2) during the hour immediately after weighing anchor or casting off, visibility may be reduced under one, but not both, of the following options:

(A) visibility may be reduced by up to 40 percent for that entire hour; or

(B) visibility may be reduced by up to 100 percent for periods aggregating no more than nine minutes during that hour;

(3) during the hour immediately before the completion of all maneuvers to anchor or make fast to the shore, visibility may be reduced under one, but not both, of the following options:

(A) visibility may be reduced by up to 40 percent for that entire hour; or

(B) visibility may be reduced by up to 100 percent for periods aggregating no more than nine minutes during that hour; and

(4) at any time not covered by (1) - (3) of this section, visibility may be reduced by up to 100 percent for periods aggregating no more than three minutes in any one hour.

Authority: AS 46.03.020 AS 46.14.030 Sec. 30, ch. 74, SLA 1993AS 46.14.010

Job Aid Item: 4.1.b

Text: Incinerator operation and procedures (observed if in operation) are IAW 18 AAC 50.050 & 50.070

Background: Cruise ships use incinerators to burn paper and other materials to reduce offloads to shore.

Please note: incinerator use in port is not restricted by Alaskan law or regulations, as long as opacity limits are met. Many ships voluntarily limit incinerator use in port, but this is not a requirement.

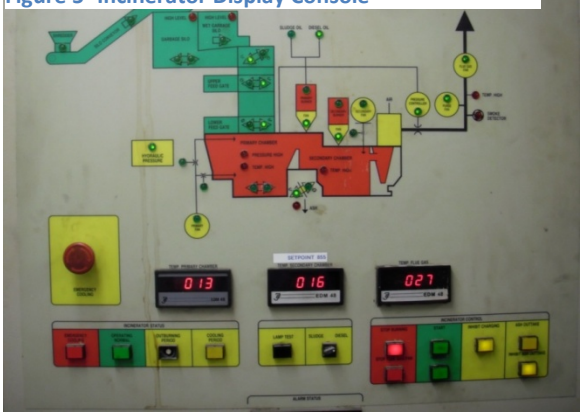
What to check: Incinerators need to be operated below 20% opacity. Although Ocean Rangers are not trained in Method 9, it is possible to observe for thick smoke, soot dropping from plume, that opacity meters are not in alarm, or that items are burned that create toxic smoke. Some of the items incinerated can cause higher opacity if not handled well, these include oily rags, oil filters, rubber materials, etc. Oily sludge or spent fuels have also been seen to increase opacity if not properly monitored.
Some incinerators have emissions controls, these controls can affect the opacity performance, if they are installed check how they are used. Is the incinerator co-fired?
►*Tip: Some vessel guidelines include voluntary actions to limit the incinerator use while in Port or in certain areas such as Tracy Arm. Check on the use of the incinerators.*

Citations: 18 AAC 50.050. Incinerator emission standards.

> (a) Visibility through the exhaust effluent of an incinerator, including an air curtain incinerator, may not be reduced by visible emissions, excluding condensed water vapor, by more than 20 percent averaged over any six consecutive minutes.

18 AAC 50.070- see item 4.1.a- Note same % as Incinerator standards.

Figure 5- Incinerator Display Console



Job Aid Item: 4.1.c

Text: Emissions IAW 18 AAC 50.110. No emissions which would immediately threaten health, property, or animal life.

Background: This is a broader nuisance regulation compared with the marine vessel emissions regulation. It is also able to capture items like burning toxic substances, soot blows that create sheens or hazardous conditions, and thick smoke that creates a hazard to others. This regulation is not limited to stack emissions, but covers open burning of wastes and other potential air pollution sources.

Figure 6: Zig-zagging ship was hazarded to other vessels

What to check: Check for large volumes of black or white smoke from the stacks. Check for soot raining down from exhaust onto the ship or docks or into the water. Check for sheens caused by soot.

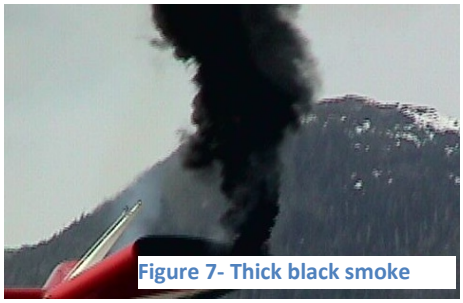


Figure 7- Thick black smoke

Figure 8: Source of soot in figure 7 (city fire department was called to the scene)

Citations: 18 AAC 50.110. Air pollution prohibited.

> No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

Job Aid Item: 4.1.d

Figure 9- Floating soot on kelp

Text: Fuel used IAW 40 CFR 1043.60

Background: The North America SECA is a newer IMO Annex VI and EPA requirement that was ratified in 2010. This was adopted by MARPOL in 2010. This is a requirement for all large ships operating from Cook Inlet west to Greenland. The EPA determined ships were a significant emissions source of sulfur oxides, which caused respiratory symptoms in ports and further inland. The lower limits apply to SECA areas which include SE Alaska, Prince William Sound and Cook Inlet. Kodiak, Dutch Harbor, and Nome are cruise ports outside of the SECA.

Sulfur levels in fuel used are related to the particle load of the exhaust and correlate to opacity levels depending on operations and maintenance. Note- the federal regulations show a change in the sulfur levels allowed in fuel in 2016, while other sources have 2015 as the start date.

Note: In 2015, many ships had been granted exemptions from the EPA. Vessels should have documentation onboard regarding the exemption. Some vessels are still in the process of installing SOx control (e.g.scrubber technology). Some vessels may have "duel Sulfur Fuel" qualities on board. Check these and verify in which sources these fuels are used. Scrubber checks fall under the EPA VGP and are found in the wastewater section.

What to check: Fuel records to see if they match requirements of 40 CFR 1043.60 except while in Kodiak or points west of Kodiak. Check the fuel used and the sulfur content of the fuel used.

Note that some operators have been granted exemptions because of items such as fuel averaging. This must be documented in the seasonal report.

The seasonal report will contain information on the procedures for recording the fuel use and how it is stored and switched including:

- How are the records kept?

- Does the vessel have an exemption from EPA for things such as fuel averaging (gas turbines)?
- If there are "high sulfur" fuels on board, how are they separated (physically) form the "low Sulfur" fuels.
- How is ensured that the low sulfur fuel is used in the areas where it is mandatory o use? (timely switch / fuel flushing)?
- Are there dedicate low sulfur combustion sources and high sulfur fuel switch sources?
- Describe / understand the fuel switch / fuel area regimes and how this is accomplished and monitored recorded.

Citations: 40 CFR 1043.30 General obligations.

(e) The following requirements apply to Party vessels, including U.S.-flagged vessels:

(1) The requirements specified in Annex VI apply for vessels subject to this part for operation in U.S. navigable waters or the U.S. EEZ. (See §1043.60 for a summary of the standards included in these requirements.)

(2) Vessels operating in an ECA must also comply with the requirements of Annex VI applicable to operation in an ECA.

(3) Vessels operating in waters of an ECA associated area must also comply with the requirements in §1043.60.

(f) The following requirements apply to non-Party vessels:

(1) Non-Party vessels operating in U.S. navigable waters or the U.S. EEZ must comply with the operating and recordkeeping requirements of the 2008 Annex VI (incorporated by reference in §1043.100) related to Regulations 13, 14 and 18 of the 2008 Annex VI. This paragraph (f)(1) does not address requirements of other portions of Annex VI.

(2) Non-Party vessels operating in an ECA or ECA associated area must also comply with the requirements in §1043.60.

§ 1043.60 Operating requirements for engines and vessels subject to this part.

This section specifies the operating requirements of this part. Note that it does not limit the operating requirements of APPS or Annex VI that are applicable to U.S.-flagged vessels outside of U.S. domestic waters.

(b) Except as specified otherwise in this part, fuel sulfur limits apply to all vessels

Table 2 to §1043.60 Annex VI Fuel Sulfur Limits [wt %]

Calendar years	Sulfur limit in all U.S. navigable waters and EEZ (percent)	Sulfur limit in ECA and ECA associated areas (percent)
2010–2011	4.50	1.00
2012–2014	3.50	1.00
2015–2019	3.50	0.10
2020 and later	0.50	0.10

(c) Operators of non-Party vessels must comply with the requirements of paragraphs (a) and (b) of this section as well as other operating requirements and restrictions specified in 2008 Annex VI (incorporated by reference in §1043.100) related to Regulations 13, 14, and 18.

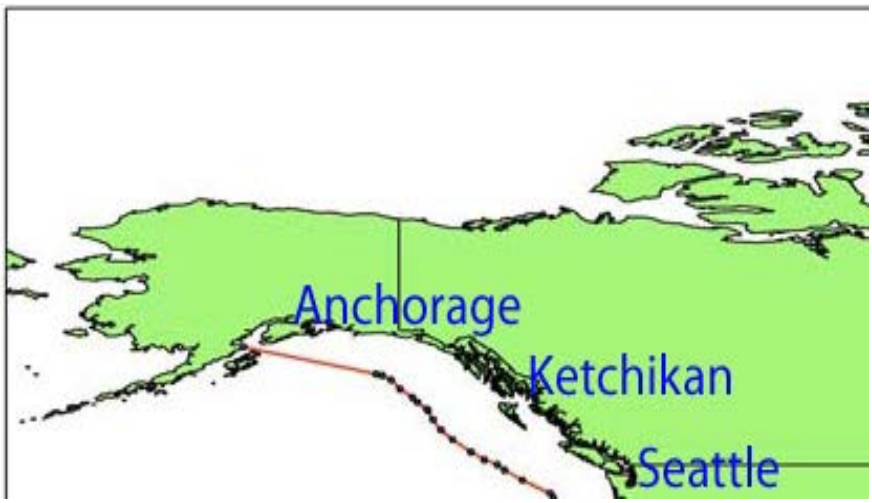


Figure 10- Map of N.A. SECA Boundaries (from EPA)

Opacity References:

Example 1: Visible Emissions Form (Method 9)

Cruise Ship Visible Emission Observation Form

Company	Cruise West
Cruise Ship	Spirit of Columbia
Location	Juneau

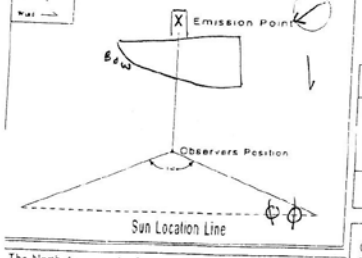
Process Equipment: —	Operating Mode: DOCKED
Control Equipment: —	Operating Mode: DOCKED

Describe Emission Point: STACK	
Height Above Sea Level (feet): 40	Height Relative to Observer (feet): 25
Distance From Observer (feet): Start 285 End 275	Direction From Observer (Degrees M_{NC}): Start 105 End ✓

Describe Emissions: rising smoke; Start plume-coned End ✓	
Emission Color: Start light grey End ✓	Steam Plume: Start N/A End N/A
Point at which the opacity was determined (feet above exit): Start 10 End ✓	

Describe Plume Background: Start mountain End ✓	
Background Color: Start green End ✓	Sky conditions: Start light rain End ✓
Wind Speed (knots): Start 0-2 End ✓	Wind Direction: Start NW End ✓
Ambient Temperature (°F): Start 50 End ✓	Relative Humidity (%): Start 93 End ✓

SOURCE LAYOUT SKETCH



The North Arrow in the drawing above is from a Magnetic Compass Reading, M_{NC} (not corrected to true North)

A written "End" Field means the same conditions existed at the start and end of reading

Observation Date	Start time	End time
9.3.08	16:29	16:44

Visibility reduction every 15 Seconds

Min	0	15	30	45	Comments
1	<5	<5	<5	<5	
2	5	5	5	5	
3	5	5	5	5	
4	5	5	5	5	
5	5	5	5	5	
6	5	5	5	5	PAN
7	5	5	5	5	
8	5	5	5	5	
9	5	5	5	5	
10	5	5	5	5	PAN
11	5	5	5	5	
12	5	5	5	5	
13	5	5	5	5	
14	5	5	5	5	
15	5	5	5	5	
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Observer's Name (Print)	
Observer's Signature	Date: 9.3.08
Certified By: HMH	Date: 6.24.08
VEO Form Number	

Company Abbreviations
NCL = Norwegian Cruise Lines
PCL = Princess Cruises
CCI = Celebrity Cruises Inc
CCL = Carnival Cruise Lines
RSS=Radisson Seven Seas
RCI = Royal Caribbean International (RCI)
HAL = Holland America Cruise Lines
CRY = Crystal Cruise Lines
WEC = World Explorer Cruises

Juneau Ship Location Abbreviations
CT= Cruiseship Terminal
ANC = Anchor Marine Park
AS = Alaska Steam Dock
FKL = S. Franklin Dock
AJD=A.J. Doc

California Air Board Visible Emissions Handbook example pages

The VE Observation Form

The VE Observation Form (see facing page) contains the information required by Method 9 when documenting a VE in the field. It also includes additional information which may be necessary. The information on the form is organized into ten sections, numbered on the form opposite. The sections include:

1. **Company Identification -** *the complete name and address of the facility where the VE observation is taken, the phone number, and the district source ID number.*
2. **Process and Control Device -** *list the types of equipment used in the process and the air pollution control equipment, and their operating status during observation.*
3. **Emission Point Identification -** *record the distance to and height of plume origin, relationship to observer's position; describe enough to distinguish from other sources*
4. **Emissions Description -** *shape, color, presence of water vapor, point where read.*
5. **Background, Weather Conditions -** *description, color background, percent of cloud cover, temperature, humidity, wind speed and direction.*
6. **Observer Position, Source Layout -** *see description on page 9.*
7. **Additional Information -** *facts about the source that are not addressed elsewhere.*
8. **Data Set -** *the date, start time, end time, and the readings in 15 second intervals for the observation period, with any necessary comments.*
9. **Observer Identification -** *reader's name, signature, date of this VE reading, reader's employer, certification agency and date most recently certified.*
10. **Forms Interrelation -** *record the number of the next form used when the readings from an observation continue on another form.*

Remember, this is the official record of your VE observation, so make it complete!

What are "Visible Emissions?" AIR POLLUTION !

Visible Emissions (VE) are just that - something visible emitted (coming out) from an air pollution source into the ambient (outdoor) air. Visible emissions are airborne plumes of solid and/or liquid **particles**, also known as **particulate matter (PM)**. Except for water vapor ("steam") plumes, the darker and/or denser a plume, the more PM air pollution it may contain.

Visible emissions are usually emitted from source equipment by means of an exhaust stack or duct, but they can also be **fugitive emissions** generated by materials handling, transfer, or other activities. The plume of smoke you see coming from a smokestack is a VE, as is the plume of dust behind a vehicle on an unpaved road.

Human Activities Which Produce Visible Emissions:

1. **Combustion, or Burning. A major PM source,** combustion occurs in vehicle engines, in household and industrial furnaces, incinerators, and stoves, and in the open, wherever burning occurs. **Smoke** and **exhaust** are familiar names for combustion air pollution.

2. **Attrition: wearing, or grinding down by friction.** The everyday "wearing out" of tires, shoes, clothes, etc. leaves PM everywhere. Industrial attrition processes which may emit PM into the air include milling, sanding, grinding, drilling, demolishing, spraying, and abrasive blasting.

3. **Condensation: changing from a gas to a solid or liquid.** Air pollution vapors and fumes form two ways: **evaporation** of volatile liquids at normal temperatures, and **forced vaporization** of solids or liquids using heat or pressure. Visible PM forms by the **condensation** of vapors and fumes.

1

Smoke & Dust - The Most Common Visible Emissions

Smoke, the product of incomplete combustion, contains particulate matter **and** the major air pollution gases carbon monoxide (CO), oxides of nitrogen (NOX), and volatile organic compounds (VOCs).

Dust emissions are usually a result of attrition, but can also be windborne soil minerals, sea salt, pollen, etc.

Particles Are Visibility Reducers - the smaller the PM, the more it reflects light and obscures the view, causing visibility problems ranging from unsightly to dangerous. And the smallest PM, **aerosols,** can remain airborne for weeks.

Inhaled Particles Can Be Hazardous to Your Health...

Smoke and dust aerosols are also **Inhalable Particulate Matter (PM10),** microscopic solid or liquid particles that are 10 microns in diameter or smaller (the average human hair is 70 microns across). **Most smoke particles are VERY small (less than a micron) droplets of condensed organic vapors (tars and gases) which escaped burning.** Other smoke PM includes **soot** (unburned carbon) and **ash** (unburnable minerals). When inhaled, PM10 particles easily travel deep into the lungs, causing irritation and coughing. **PM10 particles may be trapped in your lungs for years,** contributing to lung changes, chronic lung diseases, and cancer.

Smoke also contains VOCs which have been **changed by partial burning into toxic, irritating, and/or cancer-causing substances like benzene, formaldehyde, and benzo-a-pyrene,** a polycyclic aromatic hydrocarbon (**PAH**). VOCs adhere to soot particles which may be inhaled into the lungs.

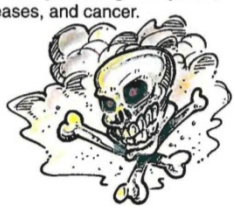
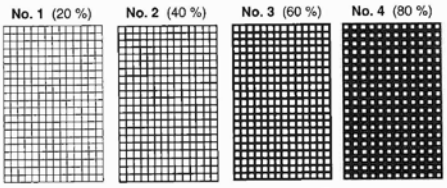


Figure 11: California Air Board VE Form Info

The Ringelmann Chart

In the late 1800's in Paris, France, Professor Maximilian Ringelmann developed the **Ringelmann Chart** to measure the combustion efficiency of coal-fired boilers. The shade of the smoke plume shows how well a boiler is operating - the poorer its combustion efficiency, the more unburned carbon particles in the smoke and the darker the plume.

Professor Ringelmann's chart established four measured shades of gray between white, valued at zero, and black, at five. These specific shades of gray, Ringelmann No. 1 to Ringelmann No. 4, can be accurately reproduced by placing a grid of black lines of a given width and spacing on a white background. Viewed from a distance, the grid lines and background merge into the shades of gray, to be compared to the shade of the smoke plume.



Ringelmann Chart (not to scale)

Regulating Visible Emissions

The Ringelmann Chart became one of the first tools used to measure visible emissions. Introduced into the United States in 1897, it was soon accepted as the standard measure of smoke density and was used by engineers for power plant testing and smokeless combustion studies. In 1910, the Chart was officially adopted as part of the Smoke Ordinance for Boston, Mass.

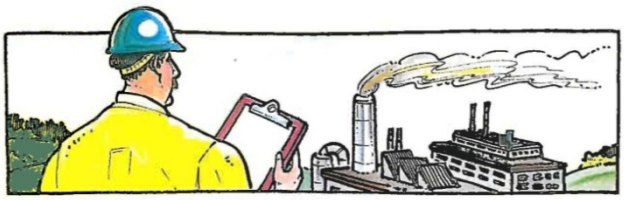
Many city, state, and federal regulations now set smoke density limits based on the Ringelmann Smoke Chart. Although not originally designed as a regulatory tool to control air pollution, it gives good practical results when used by well-trained observers.

What is EPA Reference Method 9?

It is very important that the training and certification of VE observers is standardized, as evaluating the density of visible emissions is an activity which requires training. To ensure that reliable and repeatable VE observations can be conducted anywhere in the US, in 1974 the federal Environmental Protection Agency (EPA) adopted Reference Method 9.

The protocol for Method 9, "Visual Determination of the Opacity of Emissions From Stationary Sources," is in the Code of Federal Regulations: 40CFR Ch. I, Part 60, Appendix A, Method 9. It gives the requirements for the training and testing of VE observers, the steps to follow and the data to record while documenting a VE observation. Method 9 also gives the calibration and design specifications for the equipment used to train and certify observers.

Method 9 requires recording readings in percent opacity for both black and white plumes. VE readings are taken every 15 seconds. The VE source is in violation if the **average of any group of 24 consecutive readings** (6 minutes) taken in a 1-hour period exceeds the standard.



Reference 2: EPA SECA Information

Regulatory Announcement

Designation of North American Emission Control Area to Reduce Emissions from Ships

The International Maritime Organization has officially designated waters off North American coasts as an area in which stringent international emission standards will apply for ships. These standards will dramatically reduce air pollution from ships and deliver substantial air quality and public health benefits that extend hundreds of miles inland. This fact sheet contains an overview of this new geographic emissions control program.

Overview

On March 26, 2010, the International Maritime Organization (IMO) amended the International Convention for the Prevention of Pollution from Ships (MARPOL) designating specific portions of U.S., Canadian and French waters as an Emission Control Area (ECA). The proposal for ECA designation was introduced by the U.S. and Canada, reflecting common interests, shared geography and interrelated economies. In July 2009, France joined as a co-proposer on behalf of its island territories of Saint-Pierre and Miquelon, which form an archipelago off the coast of Newfoundland. Allowing for the lead time associated with the IMO process, the North American ECA will become enforceable in August 2012.

Ships are significant contributors to the U.S. and Canadian mobile-source emission inventories, though most are flagged or registered elsewhere. Ships complying with ECA standards will reduce their emissions of nitrogen oxides (NOx), sulfur oxides (SOx), and fine particulate matter (PM2.5). In 2020, emissions from these ships operating in the ECA are expected to be reduced annually by 320,000 tons for NOx, 90,000 tons for PM2.5, and 920,000 tons for SOx, which is 23 percent, 74 percent, and 86 percent, respectively, below predicted levels in 2020 absent the ECA. The overall cost of the North American ECA is estimated at $3.2 billion in 2020, while

United States Environmental Protection Agency

Office of Transportation and Air Quality
EPA-420-F-10-015
March 2010

Regulatory Announcement

its benefits are expected to include preventing as many as 14,000 premature deaths and relieving respiratory symptoms for nearly five million people each year in the U.S. and Canada. The monetized health-related benefits are estimated to be as much as $110 billion in the U.S. in 2020.

The area of the North American ECA includes waters adjacent to the Pacific coast, the Atlantic/Gulf coast and the eight main Hawaiian Islands.[1]. It extends up to 200 nautical miles from coasts of the United States, Canada and the French territories, except that it does not extend into marine areas subject to the sovereignty or jurisdiction of other States.

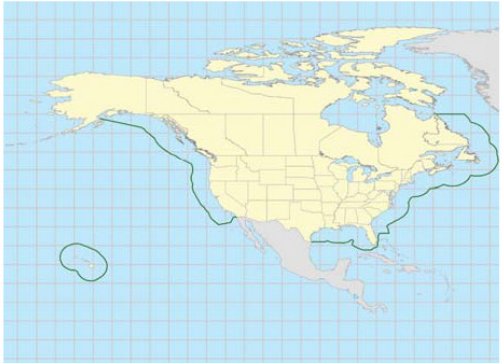


Figure 1: Area of the North American ECA

EPA is continuing to investigate whether other areas of the United States and its territories may benefit from ECA designation. We are currently performing analyses to examine whether ECA designation would be appropriate for the U.S. territories of Puerto Rico and the U.S. Virgin Islands. Some other areas for future consideration include the Pacific U.S. territories, smaller

[1] As used here, the main Hawaiian Islands include five islands of Hawaii, Maui, Oahu, Molokai, Niihau, Kauai, Lanai, and Kahoolawe. These islands are the main populated islands of the Hawaiian Islands chain, with the exception of Kahoolawe, which is an uninhabited nature reserve.

Regulatory Announcement

Hawaiian Islands, and Western Alaska. If further information supports the need for an ECA designation in any of these areas, a separate proposal would be submitted to the IMO, following the criteria contained in the international treaty known as MARPOL Annex VI.

The Need to Reduce Emissions from Ships

The diesel engines that power ships are significant mobile source emitters. The largest ship propulsion engines being produced today must meet relatively modest emission requirements.[2] In addition, both the main propulsion and the smaller auxiliary engines installed on these ships operate on fuel that can have extremely high sulfur content. As a result, these ships generate significant emissions of fine particulate matter (PM2.5), NOx, and SOx that contribute to nonattainment of the National Ambient Air Quality Standards for PM2.5 and ozone. Emissions from these engines also cause harm to public welfare, contributing to visibility impairment and other detrimental environmental impacts across the United States.

Many of our nation's most serious ozone and PM2.5 nonattainment areas are affected by emissions from ships. Currently more than 30 major U.S. ports along our Atlantic, Gulf of Mexico, and Pacific coasts are located in nonattainment areas for ozone and/or PM2.5.[3]

EPA has been advancing a coordinated strategy for many years to control air pollution from large ships. In addition to our Clean Air Act program[4], designation of U.S. waters as an ECA is a key component of EPA's strategy. Also, the ECA and other requirements of Annex VI are implemented in the United States through regulations adopted under the Act to Prevent Pollution from Ships (APPS). Finally, EPA's Clean Ports USA Program, as part of our broader National Clean Diesel Campaign, fosters innovation to achieve additional emission reductions from existing diesel engines and nonroad equipment at ports.

Air pollution from ships is expected to grow over the next two decades. Without EPA's coordinated strategy, by 2030, NOx emissions from ships would be projected to more than double, growing to 2.1 million tons a year while annual PM2.5 emissions would be expected to almost triple to 170,000 tons. The North American ECA ensures the emissions from ships that operate in our waters and ports will be reduced significantly, delivering substantial benefits to large segments of our population, as well as to marine and terrestrial ecosystems.

Emission Control Area Standards

In October 2008, the member states of IMO agreed to amend MARPOL Annex VI, adopting new tiers of NOx and fuel sulfur controls. The most stringent of these new emission standards

[2] The modest Tier I engine NOx standards continue through 2010, the marginally lower Tier II standards apply from 2011 through 2015.

[3] U.S. Army Corps of Engineers, Principal Port Rankings for 2008.

[4] EPA's CAA program includes regulations at 40 CFR parts 94, 1042, 1043, and 1065. See www.epa.gov/otaq/oceanvessels/ntm/ntm.htm

Regulatory Announcement

apply to ships operating in designated ECAs, including the newly-designated North American ECA. The table below summarizes the Annex VI standards that apply globally and within ECAs.

Table 1: International Ship Engine and Fuel Standards (MARPOL Annex VI)

	Year	Fuel Sulfur	NO_x
Emission Control Area	Today to July 2010	15,000 ppm	
	2010	10,000 ppm	
	2015	1,000 ppm	
	2016		Tier III (Aftertreatment-forcing)
Global	Today to January 2011		Tier I (Engine-based controls)
	2011		Tier II (Engine-based controls)
	Today to January 2012	45,000 ppm	
	2012	35,000 ppm	
	2020 *	5,000 ppm	

Note:

* Subject to a fuel availability study in 2018, may be extended to 2025.

The 2015 fuel sulfur standard of 0.1 percent fuel sulfur (1,000 ppm) is expected to reduce PM and SOx emissions by more than 85 percent from today's levels. This most stringent ECA fuel standard is expected to be met through fuel switching. In most cases, ships already have the capability to store two or more fuels. However, to meet the 1,000 ppm fuel sulfur requirement, some vessels may need to be modified for additional distillate fuel storage capacity. As an alternative to using lower sulfur fuel, ship operators may choose to equip their vessels with exhaust gas cleaning devices ("scrubbers"). In this case, the scrubber extracts sulfur from the exhaust.

The current Tier I NOx standards range from 9.8 to 17 g/kW-h, depending on engine speed. The Tier II standards represent a 20 percent NOx reduction below Tier I, and the Tier III standards represent an 80 percent NOx reduction below Tier I. We expect ships to meet the Tier III standard through the use of high-efficiency aftertreatment technology.

Costs

The costs of implementing and complying with the ECA are expected to be small in comparison to the health and welfare benefits and on par with the costs of achieving similar emissions reductions through additional controls on land-based sources. We estimate the total costs of improving the emissions of ships operating in the ECA from current performance to ECA standards will be approximately $3.2 billion in 2020. The cost to reduce a ton of NOx, SOx and PM is estimated at $2,400, $1,100 and $10,000, respectively, which makes this program a very cost-effective method to improve air quality in the U.S. and Canada.

Regulatory Announcement

The economic impacts of complying with the program on ships engaged in international trade are expected to be modest. For example, operating costs for a ship in a route that includes about 1,700 nautical miles of operation in the ECA may increase by about 3 percent. This operating cost increase would raise the cost of transport of a 20 foot container by about $18.

Benefits

The U.S. coastline and much of the interior of the country will experience significant improvements in air quality due to reduced PM and ozone from ships complying with ECA standards. Coastal areas will experience the largest improvements; however, significant improvements will extend hundreds of miles inland to reach nonattainment areas in states such as Nevada, Tennessee and Pennsylvania. National treasures such as the Grand Canyon National Park and the Great Smoky Mountains will also see air quality improvements.

The North American ECA is expected to yield significant health and welfare benefits. ECA standards will begin to reduce ship-related adverse health impacts for the U.S. and Canada in 2012. EPA estimates that the annual benefits in 2020 will include preventing between 5,500 and 14,000 premature deaths, 3,800 emergency room visits, and 4,900,000 cases of acute respiratory symptoms in 2020. These benefits will increase beyond 2020, as normal fleet turnover occurs and more vessels complying with the 2016 NOx standards set sail.

The monetized health benefits in 2020 in the U.S. are projected to range from $47 to $110 billion in 2006 U.S. dollars, assuming a 3 percent discount rate.

For More Information

You can access the ECA standards, the proposal to the IMO and related documents on EPA's Office of Transportation and Air Quality web site at: www.epa.gov/otaq/oceanvessels.htm

For additional information, please contact the Assessment and Standards Division at

asdinfo@epa.gov, 734-214-4636, or:
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
2000 Traverwood Dr.
Ann Arbor, MI 48105

United States Environmental Protection Agency

Office of Transportation and Air Quality
EPA-420-F-12-040
June 2012

EPA Guidance on Use of Distillate Fuel for North American ECA Compliance

Question: Does EPA require the use of 15ppm ULSD or other low viscosity marine fuel oils for compliance with the 1.00% fuel sulfur ECA standard?

Answer: While distillate fuels meet the definition of a fuel oil, and therefore using distillate fuel can clearly be an option to meet the 1.00% fuel sulfur ECA standard, EPA believes it is clear that the MEPC did not intend vessels to use straight distillate fuels (fuels with a viscosity below 11 Centistokes) to meet the 1.00% sulfur ECA standard. The technical analyses relied upon by MEPC consistently assumed that a fuel sulfur standard of 0.5% would define the split between residual fuels and distillate fuels and the MEPC consistently assumed that above 0.5% would be a residual fuel or residual fuel blend, while below 0.5% would be primarily made up of distillate fuels. In addition, distillate fuels below 1.00% sulfur are widely available in ports throughout the world and have been and are used regularly by vessels for a variety of purposes. Given this wide availability and use, there would have been no need for the Regulation 18 fuel availability provisions in Annex VI if the MEPC intended vessels to use a widely available fuel to meet the 1.00% sulfur ECA standard. Finally, requiring vessels to use widely available distillate fuel would simply advance the distillate standard set to begin in 2015.

Section 5: Safety

Note: This safety background only includes items listed in the latest Job Aid. For personal and on-the job safety, please refer to the information provided by your employer and by the vessel. If you have any questions regarding personal safety, please contact your manager immediately.
Remember to check your personal safety gear regularly. This includes head, eye, and ear protection, gloves, and flashlight.

General background:

Safety is the most important item an Ocean Ranger can check. For all other checks safety should be considered, as well as during activities such as boarding a ship. Always be vigilant for personal safety, and watch for safety concerns for passengers and crew.

Note: All safety concerns observed **must** be immediately reported to the vessel's crew and your primary onboard contacts. Include in the reporting the item, and information on how this item was brought under the attention of your primary onboard contact.

Check safety items daily or as they apply. A complete check of the vessel will not be possible for all safety items, but while checking other Job Aid sections check for safety.

Many of the other section items that you will be checking are because of safety or sanitation. For example, wastewater quality standards are to protect recreational users or shellfish consumers in Alaska.

Subsection 1: Safety

Job Aid Item: 5.1.a

Text: Observe operations (including repairs and cleaning) that may affect safety of passengers, crew and vessel.

Background: There are many hazards on a ship, and these can affect the crew, passengers and the environment. Safety items on board can more or less divided in three areas:

- Passenger safety. Examples include the lobby areas, pools, cabins, and public stairwells.
- Crew safety. Examples include galleys, winch deck, engine room, storage areas etc.
- Combined safety. When both passengers and crew may be exposed to hazards.

We have found that most safety items reported were "common sense" items and were easily fixed. A few examples included fried or exposed electric cords, deck trip hazards, and blockage of fire control equipment. All were safety items and must be reported immediately to the vessel's crew.

What to check: During daily rounds watch for unsafe conditions for either passengers or crews. Here are a few possible items:

- Passenger related (hotel): Burnt or un-insulated electric extension cords; electric cords on deck (trip hazard); other trip hazards on deck (anchor bolts); safety signs missing; overflow of water or oil on decks (slippery); protruding electric wiring; gangway securing, etc.
- Crew related:
    - Hotel: trip hazards; storage of reactive chemicals together; ladders or step stools used while not secured; paint operations with no safety gear (fall protection); ropes storage on deck; winch handle position / operational instructions missing; open electric sockets; winch/capstan safety emergency stop not labeled or identified; lifeboat maintenance operations ladder not secure.
    - Engine Room: Working with chemicals with no personal protection gear or ventilation; deck floor plates removed with no warnings or signs; open manholes with no signs; water tight doors open under all vessel conditions; escape hatches covered with items; welding or grinding with no protection for avoidance of fire; leaking water on electric control boxes; etc.
- Crew & Passengers:
    - Overhead maintenance and repair operations with no tool and or parts fall protection; no working areas fenced off or identified; air hoses and electric cables trip hazards; gangway not securely attached to the vessel.
    - Bulwark Openings / Fairleads, and "Rope Eye" openings. Some were very large and were potential safety items.

Job Aid Item: 5.1.b

Text: Marine casualty (grounding, significant harm to the environment, loss of life of serious injury, fire, or loss of propulsion, steering, or control system that reduced maneuverability) reported IAW 46 CFR 4.05 (a)(3)

Background: Although these items are relatively rare, there have been cases of power loss and small fires observed by Ocean Rangers. These events as required in 46 CFR4.05 must be reported to the US Coast Guard.

What to check: Ask if the casualty was reported. Note any marine casualty (as defined in 46 CFR 4.05) in the daily report so it can be checked by the USCG to verify it was reported. Details such as time, location, number of events, and duration need to be recorded. Also report on the root cause (if known).

Citation: 46 CFR 4.05-1: Notice of marine casualty.

(a) Immediately after the addressing of resultant safety concerns, the owner, agent, master, operator, or person in charge, shall notify the nearest Marine Safety Office, Marine Inspection Office or Coast Guard Group Office whenever a vessel is involved in a marine casualty consisting in--

(1) An unintended grounding, or an unintended strike of (allison with) a bridge;

(2) An intended grounding, or an intended strike of a bridge, that creates a hazard to navigation, the environment, or the safety of a vessel, or that meets any criterion of paragraphs (a) (3) through (8);

(3) A loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel;
(4) An occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including but not limited to fire, flooding, or failure of or damage to fixed fire-extinguishing systems, lifesaving equipment, auxiliary power-generating equipment, or bilge-pumping systems;
(5) A loss of life;
(6) An injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties; or
(7) An occurrence causing property-damage in excess of $25,000, this damage including the cost of labor and material to restore the property to its condition before the occurrence, but not including the cost of salvage, cleaning, gas-freeing, drydocking, or demurrage.
(8) An occurrence involving significant harm to the environment as defined in Sec. 4.03-65.
(b) Notice given as required by 33 CFR 160.215 satisfies the requirement of this section if the marine casualty involves a hazardous condition as defined by 33 CFR 160.203.
(c) Except as otherwise required under this subpart, if the marine casualty exclusively involves an occurrence or occurrences described by paragraph (a)(8) of this section, a report made pursuant to 33 CFR 153.203, 40 CFR 117.21, or 40 CFR 302.6 satisfies the immediate notification requirement of this section.

Definition of significant harm from 46 CFR 4.03-65

Significant harm to the environment means—
(a) In the navigable waters of the United States, a discharge of oil as set forth in 40 CFR 110.3 or a discharge of hazardous substances in quantities equal to or exceeding, in any 24-hour period, the reportable quantity determined in 40 CFR part 117;
(b) In other waters subject to the jurisdiction of the United States, including the EEZ—
(1) A discharge of oil in excess of the quantities or instantaneous rate permitted in 33 CFR 151.10 or 151.13 during operation of the ship; or
(2) A discharge of noxious liquid substances in bulk in violation of §§153.1126 or 153.1128 of this chapter during the operation of the ship; and
(c) In waters subject to the jurisdiction of the United States, including the EEZ, a probable discharge of oil, hazardous substances, marine pollutants, or noxious liquid substances. The factors you must consider to determine whether a discharge is probable include, but are not limited to— (1) Ship location and proximity to land or other navigational hazards; (2) Weather; (3) Tide current; (4) Sea state; (5) Traffic density; (6) The nature of damage to the vessel; and (7) Failure or breakdown aboard the vessel, its machinery, or equipment.

Job Aid Item: 5.1.c

Text: Personal Protective Equipment, use, and storage recommendations contained in MSDSs for onboard chemicals are followed IAW Material Safety Data Sheets (MSDS)

Background: Material safety data sheets or products safety datasheets should be supplied with all potentially hazardous or toxic chemicals. These sheets are intended to inform the end user of hazards, physical data, and how to safely handle and use the product. They should also identify the use and need of personal protection gear.

What to check: MSDS (if available) recommendations are being followed with regard to safety, storage, and disposal requirements to protect passengers and crew. There can be flag state differences in the name and style of safety information. The Safety Management System (SMS) should include information on what is required and how to find the safety information.
MSDS or similar sheets can be a useful way to determine if a substance is toxic and/or hazardous when checking items in Section 3 and must be included (if available) in waste offload plans if hazardous waste is offloaded in Alaska.

Citation: 18 AAC 69.040. Hazardous waste and hazardous substance offloading plan. (Excerpt)

(a) As part of the plan required under AS 46.03.475(e)(2), that describes a vessel's policies and procedures for offloading of hazardous waste or a hazardous substance from a vessel while that vessel is operating in the marine waters of the state, and to the extent that the offloading is not covered by a report or notice submitted under AS 46.03.475(d), the owner or operator shall include, for each vessel that the owner or operator intends to operate, or cause or allow to operate, and for each hazardous waste or hazardous substance anticipated to be offloaded,

(3) material safety information provided by the manufacturer, if applicable;

33 CFR 96.230 What objectives must a safety management system meet?

The safety management system must:(a) Provide for safe practices in vessel operation and a safe work environment onboard the type of vessel the system is developed for;(b) Establish and implement safeguards against all identified risks;(c) Establish and implement actions to continuously improve safety management skills of personnel ashore and aboard vessels, including preparation for emergencies related to both safety and environmental protection; and(d) Ensure compliance with mandatory rules and regulations, taking into account relevant national and international regulations, standards, codes and maritime industry guidelines, when developing procedures and policies for the safety management system.

33 CFR 96.310 Who does this subpart apply to?

This subpart applies:(a) If you are a responsible person who owns a vessel(s) registered in the U.S. and engaged on a foreign voyage(s), or holds certificates or endorsement of such voyages;(b) If you are a responsible person who owns a vessel(s) registered in the U.S. and volunteer to meet the standards of this part and Chapter IX of SOLAS;(c) To all foreign vessels engaged on a foreign voyage, bound for ports or places under the jurisdiction of the U.S., and subject to Chapter IX of SOLAS; or(d) If you are a recognized organization authorized by the U.S. to complete safety management audits and certification required by this part.

33 CFR 96.370 What are the requirements for vessels of countries not party to Chapter IX of SOLAS?

(a) Each foreign vessel which carries more than 12 passengers, or is a tanker, bulk freight vessel, freight vessel, or self-propelled mobile offshore drilling unit of 500 gross tons or more, operated in U.S. waters, under the authority of a country not a party to Chapter IX of SOLAS must—(1) Have on board valid documentation showing that the vessel's company has a safety management system which was audited and assessed, consistent with the International Safety Management Code of IMO Resolution A.741(18);(2) Have on board valid documentation from a vessel's Flag Administration showing that the vessel's safety management system was audited and assessed to be consistent with the International Safety Management Code of IMO Resolution A.741(18); or(3) Show that evidence of compliance was issued by either a government that is party to SOLAS or an organization recognized to act on behalf of the vessel's Flag Administration.(b) Evidence of compliance must contain all of the information in, and have substantially the same format as a—(1) Document of Compliance certificate; and(2) Safety Management Certificate.(c) Failure to comply with this section will subject the vessel to the compliance and enforcement procedures of § 96.380 of this part.

Section 6: Health; Sanitation

General background:

Sanitation is a concern on cruise ships because of the high density of people concentrated in a small area. A problem with food preparation, drinking water, or a swimming pool could impact hundreds of passengers or crew. Operators take this issue very seriously, and have a voluntary agreement with CDC to check for potential problems. Results of the US Center for Diseases Control and Prevention (CDC) inspection scores and identified deficiencies are posted online to give travelers an idea of the sanitation conditions present at the time of the inspection. Because the CDC Vessel Sanitation Guidebook is a voluntary agreement, these standards are not translated into direct regulatory requirements but are good guidelines.

Figure 1- Potable water sampling

Figure 2- galley food prep

Subsection 1: Potable Water

Figure 4 Example potable water source

Figure 3- Cap on ground

Job Aid Item: 6.1.a

Text: Potable Water hook ups, IAW supplier (municipality or port), vessel procedures, 21 CFR 1240.86 and 21 CFR 1250.82

Background: Potable water is one of the most basic human needs, and properly treated and clean water is necessary to avoid disease. Improperly handled water could contaminate the water supply aboard the vessel and potentially allow disease to enter a community water supply system.

What to check: Potable water tanks are dedicated for potable water and tanks and pipes are clearly marked. Check for potential sources of contamination of these tanks such as sanitary drains through the tanks (unless a pipe within a pipe). Check that water is disinfected in some way. Check that ice used in drinks or food preparation is only from potable water. Proper connection procedures are followed.

Citations: 21 CFR 1240.80 General requirements for water for drinking and culinary purposes.

Only potable water shall be provided for drinking and culinary purposes by any operator of a conveyance engaged in interstate traffic, except as provided in § 1250.84(b) of this chapter. Such water shall either have been obtained from watering points approved by the Commissioner of Food and Drugs, or, if treated aboard a conveyance, shall have been subjected to treatment approved by the Commissioner of Food and Drugs.

21 CFR 1250.80 Applicability.

The sanitation facilities and the sanitary conditions on vessels engaged in interstate traffic shall comply with the requirements prescribed in this subpart, provided that no major structural change will be required on existing vessels.

21 CFR 1250.82 Potable water systems.

The following conditions must be met by vessel water systems used for the storage and distribution of water which has met the requirements of Sec. 1240.80 of this chapter.

(a) The potable water system, including filling hose and lines, pumps, tanks, and distributing pipes, shall be separate and distinct from other water systems and shall be used for no other purposes.

(b) All potable water tanks shall be independent of any tanks holding nonpotable water or other liquid. All potable water tanks shall be independent of the shell of the ship unless (1) the bottom of the tank is at least 2 feet above the maximum load water line, (2) the seams in the shell are continuously welded, and (3) there are no rivets in that part of the shell which forms a side of a tank. A deck may be used as the top of a tank provided there are no access or inspection openings or rivets therein, and the seams are continuously welded. No toilet or urinal shall be installed immediately above that part of the deck which forms the top of a tank. All potable water tanks shall be located at a sufficient height above the bilge to allow for draining and to prevent submergence in bilge water.

(c) Each potable water tank shall be provided with a means of drainage and, if it is equipped with a manhole, overflow, vent, or a device for measuring depth of water, provision shall be made to prevent entrance into the tank of any contaminating substance. No deck or sanitary drain or pipe carrying any nonpotable water or liquid shall be permitted to pass through the tank.

(d) Tanks and piping shall bear clear marks of identification.

(e) There shall be no backflow or cross connection between potable water systems and any other systems. Pipes and fittings conveying potable water to any fixture, apparatus, or equipment shall be installed in such way that backflow will be prevented. Waste pipes from any part of the potable water system, including treatment devices, discharging to a drain, shall be suitably protected against backflow.

(f) Water systems shall be cleaned, disinfected, and flushed whenever the Commissioner of Food and Drugs shall find such treatment necessary to prevent the introduction, transmission, or spread of communicable diseases.

Figure 5: Potable Water Cabinet

21 CFR 1250.83 Storage of water prior to treatment.

The following requirements with respect to the storage of water on vessels prior to treatment must be met in order to obtain approval of treatment facilities under Sec. 1240.90 of this chapter.

(a) The tank, whether independent or formed by the skin of the ship, deck, tank top, or partitions common with other tanks, shall be free of apparent leakage.

(b) No sanitary drain shall pass through the tank.

(c) The tank shall be adequately protected against both the backflow and discharge into it of bilge or highly contaminated water.

21 CFR 1250.84 Water in galleys and medical care spaces.

(a) Potable water, hot and cold, shall be available in the galley and pantry except that, when potable water storage is inadequate, nonpotable water may be piped to the galley for deck washing and in connection with garbage disposal. Any tap discharging nonpotable water which is installed for deck washing purposes shall not be more than 18 inches above the deck and shall be distinctly marked ``For deck washing only''.

(b) In the case of existing vessels on which heat treated wash water has been used for the washing of utensils prior to the effective date of the regulations in this part, such water may continue to be so used provided controls are employed to insure the heating of all water to at least 170 deg.F before discharge from the heater.

(c) Potable water, hot and cold, shall be available in medical care spaces for hand-washing and for medical care purposes excluding hydrotherapy.

21 CFR 1250.85 Drinking fountains and coolers; ice; constant temperature bottles.

(a) Drinking fountains and coolers shall be constructed of impervious, nonoxidizing material, and shall be so designed and constructed as to be easily cleaned. The jet of a drinking fountain shall be slanting and the orifice of the jet shall be protected by a guard in such a manner as to prevent contamination thereof by droppings from the mouth. The orifice of such a jet shall be located a sufficient distance above the rim of the basin to prevent backflow.

(b) Ice shall not be permitted to come in contact with water in coolers or constant temperature bottles.

(c) Constant temperature bottles and other containers used for storing or dispensing potable water shall be kept clean at all times and shall be subjected to effective bactericidal treatment after each occupancy of the space served and at intervals not exceeding one week.

21 CFR 1250.86 Water for making ice.

Only potable water shall be piped into a freezer for making ice for drinking and culinary purposes.

Job Aid Item: 6.1.b

Text: Potable hose is dedicated for potable water and connections are sanitized / capped before use IAW 18 AAC 80.015

Background: Contamination of potable water could occur from hoses or caps used on those hoses that come into contact with contaminants or the ground. If connected to a municipal system, this could contaminate that system as well. CDC recommends connections sanitized with 100 mg/L chlorine and flushing hoses.

Figure 6- Hose elevated above ground.

What to check: Potable water hoses are dedicated- these could be labeled, properly stored away from other hoses, etc. Check that connections are sanitized and capped. Check that hoses are flushed prior to connection and drained after use. Hoses should be stored so that dirt and liquids cannot collect inside.

Citation: 18 AAC 80.015:

Well protection, source water protection, and well decommissioning.

(a) A person may not

(1) cause pollution or contamination to enter a public water system; or

(2) create or maintain a condition that has a significant potential to cause or allow the pollution or contamination of a public water system.

► TIP: Check if the correct hose is used. Often dedicated hoses (blue colored) are used for the potable water bunkering. When different hoses types, colors etc. are used, or used as extension, check if these hoses are designated and used only for potable water service

► TIP: Some operators used the dock "bull-rail" to lay the hose free of the ground. Is this bull-rail contaminated with bird feces? In some cases the hose (bending) will touch the deck / ground. This should be minimized.

Job Aid Item: 6.1.c

Text: Potable hose properly stored and used 'free of the ground' IAW 18 AAC 80.015

Background: Hoses on the ground could pick up contamination, particularly if there are leaks on the hose.

What to check: Hoses are elevated where possible to minimize contact with the ground.

Citation: See 6.1.c.

Job Aid Item: 6.1.d

Text: Potable water system free of cross connections or has backflow prevention IAW 18 AAC 80.025

Background: When a ship connects to a municipal water system, there is a potential for contamination to enter if there are cross-connections on the ship and there is no backflow protection. This is a health concern for any source connected to a municipal system. A backflow preventer is commonly attached to the connection on the docks utility or metering system. Some vessels have their own backflow preventer as well. Some systems have flow direction indication, flow indicators may identify possible back flow. Back flow may occur when the pressure of the vessels potable system (tanks) is greater than the supply (shore) system pressure.

Figure 7: Backflow preventer

What to check: Backflow protection is used either at the source of the potable water or onboard before the distribution system. If no backflow connector, search for potential sources of cross-contamination.

Citations:

18 AAC 80.025. Cross-connections prohibited and backflow protection

(a) A person may not construct, install, or use of a cross-connection in a public water system, or allow a water system that contains a cross-connection to connect to a public water system.

(b) If the department determines that a facility has the potential to contaminate a public water system through backflow, the owner of the public water system shall install, maintain, and test on the water service line to and at other locations in that facility, a backflow prevention device that conforms to ANSI/AWWA Standards C510-97, *Double Check Valve Backflow Prevention Assembly,* or C511-97, *Reduced-Pressure Principle Backflow Prevention Assembly,* adopted by reference in 18 AAC 80.010(b). The owner of the public water system may delegate the installation, maintenance, and testing of the backflow prevention device to the operator of the facility that poses the risk. This delegation does not relieve the owner of the public water system of the responsibility to install, maintain, and test the backflow prevention device.

21 CFR 1240.86 Protection of pier water system.

No vessel engaged in interstate traffic shall make a connection between its nonpotable water system and any pier potable water system unless provisions are made to prevent backflow from the vessel to the pier.

Subsection 2: Swimming Pools Sanitation; Spa Sanitation; Safety

Job Aid Item: 6.2.a

Text: Water is filtered in re-circulated swimming pool IAW 21 CFR 1250.89

Background: Pools need to be filtered to regularly clean the water to reduce sanitation issues. Recirculation also assists in helping mix water so that halogens can lower bacteria levels.

What to check: Swimming pools are filtered and recirculated, unless they are of the saltwater flow-through type. Recirculation needs to occur at least every six hours. Check for evidence of inadequate filtration, such as sand on the bottom of the pool from failed filtration units.

Citation: 21 CFR 1250.89 Swimming pools.

(a) Fill and draw swimming pools shall not be installed or used.

(b) Swimming pools of the recirculation type shall be equipped so as to provide complete circulation, replacement, and filtration of the water in the pool every six hours or less. Suitable means of chlorination and, if necessary, other treatment of the water shall be provided to maintain the residual chlorine in the pool water at not less than 0.4 part per million and the pH (a measure of the hydrogen ion concentration) not less than 7.0.

(c) Flowing-through types of salt water pools shall be so operated that complete circulation and replacement of the water in the pool will be effected every 6 hours or less. The water delivery pipe to the pool shall be independent of all other pipes and shall originate at a point where maximum flushing of the pump and pipe line is effected after leaving polluted waters.

Job Aid Item: 6.2.b

Text: Free residual halogen of > 0.4 mg/ L (ppm) and pH not less than 7.0 is maintained in re-circulated swimming pools. (21 CFR 1250.89 (b))

Background: Pools must have a level of halogens to disinfect to reduce the likelihood of spread of diseases. pH must be maintained because low pH can interfere with the effectiveness of the halogen, and cause irritation for swimmers. pH should be in 1 7.0 to 7.6 range. Halogens should be in a range

of 1 to 3 mg/L, but the regulation is only for at least 0.4 mg/L. A cruise ship should be recording these levels for the CDC.

What to check: Halogen and pH are measured and are greater than 0.4 mg/L of halogen (chlorine or bromine) and pH is at least 7.0.

Citation: See item 6.2.a

Figure 8- Water metering

Job Aid Item: 6.2.c

Text: Halogen test is provided and used IAW 21 CFR 1250.89 (b)

Background: If they are maintaining residual halogen levels then they must be testing for them.

What to check: If halogen levels are maintained as in item 6.3.b check that a halogen test is provided. This could be a chlorine test kit, bromine test kit, or meters.

Citations: See 6.2.a

Section 7: Oil Pollution

General background:

Oil pollution is covered by MARPOL Annex I along with federal and state laws regarding the discharge of oil and oily wastes. In the United States the most general oil regulation is 40 CFR 110.3 which prohibits discharge of oil in amounts which would cause a sheen, film, or discoloration of water.

In the late 1990's and early 2000's oil pollution was in the news as several cruise operators paid fines totaling several millions of dollars for discharges of oil or oily waters. More recent cases in the general shipping community involved bypasses ("magic pipes") of oily water separators (OWS) and false reporting of Oil Record Books (ORB).

Any sheens noted in the water need to be immediately reported to the vessel that you are reporting on. The oil reporting from must also be filled out and submitted to your employer and ADEC. Many observed sheens have not been caused by a cruise ship, but either by cruise ship related activities or other harbor activities. All spills and sheens must be reported as quickly as possible, so that a source can be determined and clean up (if possible) can begin.

Figure 1- Oil droplets from azipod seal failure

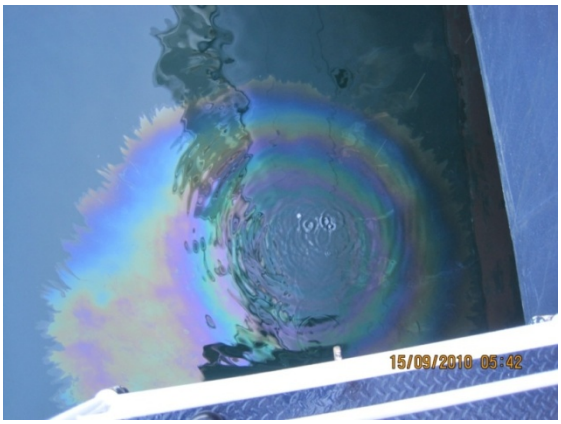


Figure 2- Small spill from ruptured hydraulic line

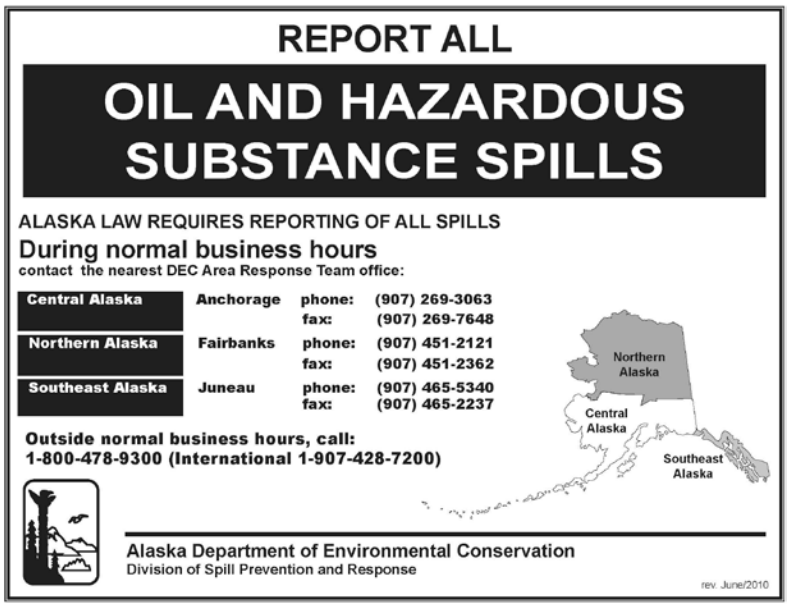


Figure 3- Alaska Oil Pollution Placard

Alaska Department of Environmental Conservation

Discharge Notification and Reporting Requirements

AS 46.03.755 and 18 AAC 75 Article 3

Notification of a discharge must be made to the nearest Area Response Team during working hours:

Anchorage	(907) 269-3063 (907) 269-7648 (FAX)	Fairbanks	(907) 451-2121 (907) 451-2362 (FAX)	Juneau	(907) 465-5340 (907) 465-2237 (FAX)

OR

to the 24-Hour Emergency Reporting Number during non-working hours:
1-800-478-9300 (International 1-907-428-7200)

Notification Requirements

Hazardous Substance Discharges

Any release of a hazardous substance must be reported as soon as the person has knowledge of the discharge.

Oil Discharges

- **TO WATER**
  - Any release of oil to water must be reported as soon as the person has knowledge of the discharge.
- **TO LAND**
  - Any release of oil in ***excess of 55 gallons*** must be reported as soon as the person has knowledge of the discharge.
  - Any release of oil in ***excess of 10 gallons, but 55 gallons or less,*** must be reported within 48 hours after the person has knowledge of the discharge.
  - A person in charge of a facility or operation shall maintain, and provide to the Department on a monthly basis, a written record of any discharge of oil ***from 1 to 10 gallons***.
- **TO IMPERMEABLE SECONDARY CONTAINMENT AREAS**
  - Any release of oil ***in excess of 55 gallons*** must be reported within 48 hours after the person has knowledge of the discharge.

Figure 4: Alaska Reporting requirements.

General Citations:

State of Alaska:

AS 46.03.740. OIL POLLUTION.

A person may not discharge, cause to be discharged, or permit the discharge of petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or a residuary product of petroleum, into, or upon the waters or land of the state except in quantities, and at times and locations or under circumstances and conditions as the department may by regulation permit or where permitted under art. IV of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended.

AS 46.03.745. HAZARDOUS SUBSTANCE RELEASE.

Except for a controlled release, the reporting of which is the subject of an agreement with the commissioner under AS 46.09.010(b), a person may not cause or permit the release of a hazardous substance as defined in AS 46.09.900.

18 AAC 75.300. Discharge or release notification; reporting requirements.

(a)Subject to (b), (c), and (g) of this section, a person in charge of a facility or operation shall notify the department by telephone, and immediately afterwards send the department a written notice by facsimile, hand delivery, or first class mail, informing the department about a discharge or release of a hazardous substance at or from the facility or operation as follows:

(1) as soon as the person has knowledge of a

(A) discharge or release of a hazardous substance other than oil;

(B) discharge or release of oil to water; or

(C) discharge or release, including a cumulative discharge or release, of oil in excess of 55 gallons solely to land outside an impermeable secondary containment area or structure; and

Definitions in AS 46.03.826

"oil" means a derivative of a liquid hydrocarbon and includes crude oil, lubricating oil, sludge, oil refuse or another petroleum-related product or by-product;

"hazardous substance" means

(A) an element or compound which, when it enters into the atmosphere or in or upon the water or surface or subsurface land of the state, presents an imminent and substantial danger to the public health or welfare, including but not limited to fish, animals, vegetation, or any part of the natural habitat in which they are found;

(B) oil; or

(C) a substance defined as a hazardous substance under 42 U.S.C. 9601(14);

in AS 46.09.900

(4) "hazardous substance" means (A) an element or compound that, when it enters into or on the surface or subsurface land or water of the state, presents an imminent and substantial danger to the public health or welfare, or to fish, animals, vegetation, or any part of the natural habitat in which fish, animals, or wildlife may be found; or (B) a substance defined as a hazardous substance under 42 U.S.C. 9601 - 9657 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980); "hazardous substance" does not include uncontaminated crude oil or uncontaminated refined oil;

(6) "release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, except that "release" does not include a permitted release or an act of nature;

Federal Citations:

40 CFR 110.3 Discharge of oil in such quantities as "may be harmful" pursuant to section 311(b)(4) of the Act.

For purposes of section 311(b)(4) of the Act, discharges of oil in such quantities that the Administrator has determined may be harmful to the public health or welfare or the environment of the United States include discharges of oil that:

(a) Violate applicable water quality standards; or

(b) Cause a film or sheen upon or dis-coloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

40 CFR 110.4 Dispersants.

Addition of dispersants or emulsifiers to oil to be discharged that would circumvent the provisions of this part is prohibited.

40 CFR 110.5 Discharges of oil not determined "as may be harmful" pursuant to Section 311(b)(3) of the Act.

Notwithstanding any other provisions of this part, the Administrator has not determined the following discharges of oil ''as may be harmful'' for purposes of section 311(b) of the Act:

(a) Discharges of oil from a properly functioning vessel engine (including an engine on a public vessel) and any discharges of such oil accumulated in the bilges of a vessel discharged in compliance with MARPOL 73/78, Annex I, as provided in 33 CFR part 151, subpart A;

(b) Other discharges of oil permitted under MARPOL 73/78, Annex I, as provided in 33 CFR part 151, subpart A; and

(c) Any discharge of oil explicitly permitted by the Administrator in connection with research, demonstration projects, or studies relating to the prevention, control, or abatement of oil pollution.

33 CFR 151.10 (b) Control of oil discharges.

(b) When within 12 nautical miles of the nearest land, any discharge of oil or oily mixtures into the sea from a ship other than an oil tanker or from machinery space bilges of an oil tanker is prohibited except when all of the following conditions are satisfied—

(1) The oil or oily mixture does not originate from cargo pump room bilges;

(2) The oil or oily mixture is not mixed with oil cargo residues;

(3) The oil content of the effluent without dilution does not exceed 15 ppm;

(4) The ship has in operation oily-water separating equipment, a bilge monitor, bilge alarm, or combination thereof as required by part 155 subpart B of this chapter; and

(5) The oily-water separating equipment is equipped with a 15 ppm bilge alarm; for U.S. inspected ships, approved under 46 CFR 162.050 and for U.S. uninspected ships and foreign ships, either approved under 46 CFR 162.050 or listed in the current International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) Circular summary of MARPOL 73/78 approved equipment.

Note: In the navigable waters of the United States, the Federal Water Pollution Control Act (FWPCA), section 311(b)(3) and 40 CFR Part 110 govern all discharges of oil or oily-mixtures.

(c) The overboard discharge of any oil cargo residues and oily mixtures that include oil cargo residues from an oil tanker is prohibited, unless discharged in compliance with part 157 of this chapter.

33 CFR 151.10 (f) Control of oil discharges.

(f) The person in charge of an oceangoing ship that cannot discharge oily mixtures into the sea in compliance with paragraphs (a), (b), (c), or (d) of this section must ensure that those oily mixtures are—

(1) Retained on board; or

(2) Discharged to a reception facility. If the reception facility is in a port or terminal in the United States, each person who is in charge of each oceangoing tanker or any other oceangoing ship of 400 gross tons or more shall notify the port or terminal, at least 24 hours before entering the port or terminal, of—

(i) The estimated time of day the ship will discharge oily mixtures;

(ii) The type of oily mixtures to be discharged; and

(iii) The volume of oily mixtures to be discharged.

(g) No discharge into the sea shall contain chemicals or other substances introduced for the purpose of circumventing the conditions of discharge specified in this regulation.

Note: There are Federal, state, or local laws or regulations that could require a written description of the oil residues and oily mixtures to be discharged. For example, a residue or mixture containing oil might have a flashpoint less than 60 °C (140 °F) and thus have the characteristic of ignitability under 40 CFR261.21, which might require a description of the waste for a manifest under 40 CFR Part 262, subpart B. Occupational safety and health concerns may be covered, as well as environmental ones.

The notice required in this section is in addition to those required by other Federal, state, and local laws and regulations. Affected persons should contact the appropriate Federal, state, or local agency to determine whether other notice and information requirements, including 40 CFR Parts 262 and 263, apply to them.

Definitions (federal- 33CFR 151.05):

Oil means petroleum whether in solid, semi-solid, emulsified, or liquid form,
including but not limited to, crude oil, fuel oil, sludge, oil refuse, oil residue, and refined products, and, without limiting the generality of the foregoing, includes the substances listed in Appendix I of Annex I of MARPOL 73/78. "Oil" does not include animal and vegetable based oil or noxious liquid substances (NLS) designated under Annex II of MARPOL 73/78.

Oily mixture means a mixture, in any form, with any oil content. "Oily mixture" includes, but is not limited to—

(1) Slops from bilges;

(2) Slops from oil cargoes (such as cargo tank washings, oily waste, and oily refuse);

(3) Oil residue; and

(4) Oily ballast water from cargo or fuel oil tanks.

Discharge means any release, however caused, from a ship and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying. It does not include—

(1) Dumping within the meaning of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, done at London on 13November 1972; or

(2) Release of oil or oily mixtures directly arising from the exploration, exploitation and associated off-shore processing of sea-bed mineral resources.

Oil Record Book: ORB

See included "Example of ORB pages large cruise vessel" "Example of typical Bunker Receipt".

- Vessels offload sludge oil. Most offloads may be in Victoria or Vancouver BC (Canada).
- Vessels generally do not use the OWS system to discharge in Alaska waters.
- Oil Record Book (ORB) shall be kept updated on board of the vessel. This record should provide a clear set out of the oil handling, sludge handling and all oil discharges.
- The ORB is in most cases kept in the Engine Control Room (ECR) and should be updated as operations are completed. In the ORB are letter codes and item numbers. These letter code / item numbers "explain" which operations took place. These codes are required by the IMO regulations.

- FORM A (as it is on board) should include or reference "Means for retention and disposal of oil residues (sludge) regulation 17 and bilge water holding tanks". This is very helpful information because it tells the OR what tanks / systems are available.
- Cruise ships generally have relatively complex oily / bilge water process systems. Varying from sludge concentrators (separators) to advanced filtration processes. Take the time to check / trace these operations.(seasonal checklist item)
- Abbreviations & symbols. Some vessels appear to use "cryptic" or unreadable entries in the ORB. Check and ask what the abbreviations (if any used) mean and where the "key" / conventions for these abbreviations are kept.(seasonal checklist item)
- Fuel bunkering actions including the bunkering of diesel oils and other lub oil products in bulk are kept in the ORB. Asked where the bunker receipts are located. (seasonal checklist item)
- Note: Current IMO Annex VI requirements include fuel sulfur content limitations. Often a second Bunker sample/analysis is provided to determine fuel quality / sulfur content (Fobas etc.) See Air Section.

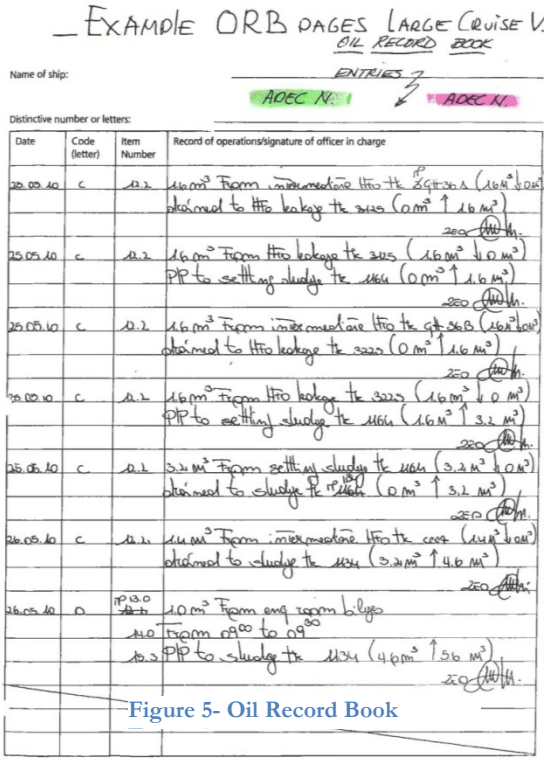
Citations: 33 CFR 151.25 Oil Record Book.

(a) Each oil tanker of 150 gross tons and above, ship of 400 gross tons and above other than an oil tanker, and manned fixed or floating drilling rig or other platform shall maintain an Oil Record Book Part I (Machinery Space Operations). An oil tanker of 150 gross tons and above or a non oil tanker that carries 200 cubic meters or more of oil in bulk, shall also maintain an Oil Record Book Part II (Cargo/Ballast Operations).
(b) An Oil Record Book printed by the U.S. Government is available to the masters or operators of all U.S. ships subject to this section, from any Coast Guard Sector Office, Marine Inspection Office, or Captain of the Port Office.
(c) The ownership of the Oil Record Book of all U.S. ships remains with the U.S. Government.
(d) Entries shall be made in the Oil Record Book on each occasion, on a tank to tank basis if appropriate, whenever any of the following machinery space operations take place on any ship to which this section applies—

(1) Ballasting or cleaning of fuel oil tanks;
(2) Discharge of ballast containing an oily mixture or cleaning water from fuel oil tanks;
(3) Disposal of oil residue; and
(4) Discharge overboard or disposal otherwise of bilge water that has accumulated in machinery spaces.

(e) Entries shall be made in the Oil Record Book on each occasion, on a tank to tank basis if appropriate, whenever any of the following cargo/ballast operations take place on any oil tanker to which this section applies—

(1) Loading of oil cargo;
(2) Internal transfer of oil cargo during voyage;
(3) Unloading of oil cargo;
(4) Ballasting of cargo tanks and dedicated clean ballast tanks;
(5) Cleaning of cargo tanks including crude oil washing;
(6) Discharge of ballast except from segregated ballast tanks;


EXAMPLE ORB PAGES LARGE CRUISE V.
OIL RECORD BOOK
Name of ship: ENTRIES
ADEC N. ADEC N.
Distinctive number or letters:

Date	Code (letter)	Item Number	Record of operations/signature of officer in charge
26.05.10	C	0.2	1.6 m³ From intermediate HFO tk 2G#30 s (1.6 m³ ↓ 0 m³) obtained to HFO leakage tk 3125 (0 m³ ↑ 1.6 m³) 250
25.05.10	C	0.2	1.6 m³ From HFO leakage tk 3125 (1.6 m³ ↓ 0 m³) PP to settling sludge tk 1164 (0 m³ ↑ 1.6 m³) 250
25.05.10	C	0.2	1.6 m³ From intermediate HFO tk 2G#36B (1.6 m³ ↓ 0 m³) obtained to HFO leakage tk 3225 (0 m³ ↑ 1.6 m³) 250
25.05.10	C	0.2	1.6 m³ From HFO leakage tk 3225 (1.6 m³ ↓ 0 m³) PP to settling sludge tk 1164 (1.6 m³ ↑ 3.2 m³) 250
25.05.10	C	0.2	3.2 m³ From settling sludge tk 1164 (3.2 m³ ↓ 0 m³) obtained to sludge tk 1164 (0 m³ ↑ 3.2 m³) 250
26.05.10	C	0.2	1.4 m³ From intermediate HFO tk 2G#4 (1.4 m³ ↓ 0 m³) obtained to sludge tk 1164 (3.2 m³ ↑ 4.6 m³) 250
26.05.10	O	19:30	1.0 m³ From eng room bilges
		11.0	From 08⁰⁰ to 09³⁰
		10.3	PP to sludge tk 1164 (4.6 m³ ↑ 5.6 m³) 250

Figure 5- Oil Record Book

(7) Discharge of water from slop tanks;
(8) Closing of all applicable valves or similar devices after slop tank discharge operations;
(9) Closing of valves necessary for isolation of dedicated clean ballast tanks from cargo and stripping lines after slop tank discharge operations; and
(10) Disposal of oil residue.

(f) Entries shall be made in the Oil Record Book on each occasion, on a tank-to tank basis if appropriate, whenever any of the following operations take place on a fixed or floating drilling rig or other platform to which this section applies—

(1) Discharge of ballast or cleaning water from fuel oil tanks; and
(2) Discharge overboard of platform machinery space bilge water.

(g) In the event of an emergency, accidental or other exceptional discharge of oil or oily mixture, a statement shall be made in the Oil Record Book of the circumstances of, and the reasons for, the discharge.

(h) Each operation described in paragraphs (d), (e) and (f) of this section shall be fully recorded without delay in the Oil Record Book so that all the entries in the book appropriate to that operation are completed. Each completed operation shall be signed by the person or persons in charge of the operations concerned and each completed page shall be signed by the master or other person having charge of the ship.

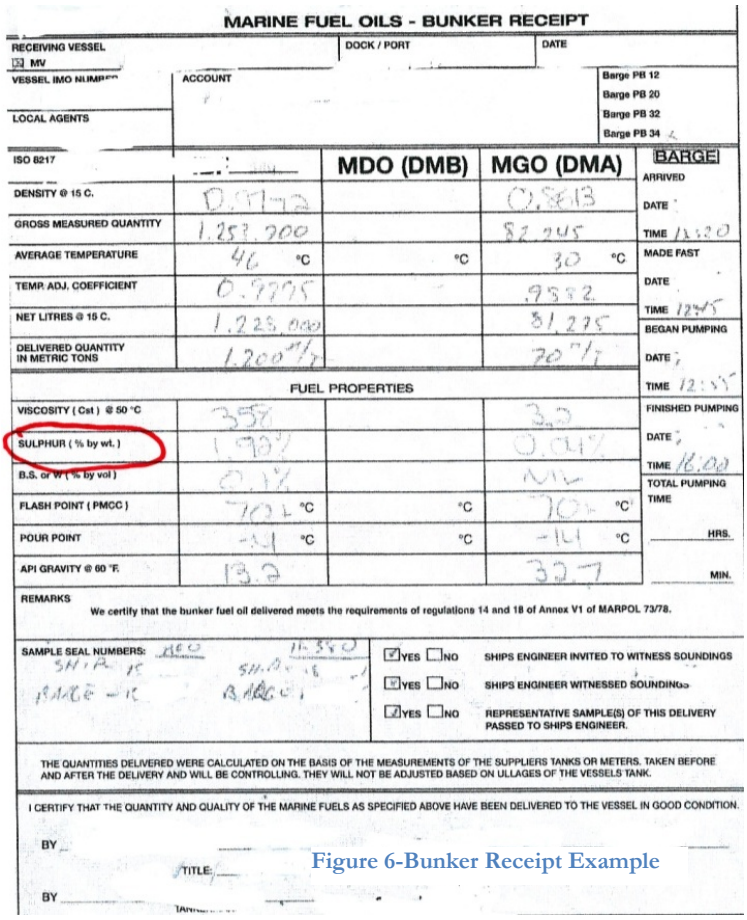
(i) The Oil Record Book shall be kept in such a place as to be readily available for inspection at all reasonable times and shall be kept on board the ship.

(j) The master or other person having charge of a ship required to keep an Oil Record Book shall be responsible for the maintenance of such record.

(k) The Oil Record Book for a U.S. ship shall be maintained on board for not less than three years.

(l) This section does not apply to a barge or a fixed or floating drilling rig or other platform that is not equipped to discharge overboard any oil or oily mixture.

(m) This section does not apply to a fixed or floating drilling rig or other platform that is operating in compliance with a valid National Pollutant Discharge Elimination System (NPDES) permit.


MARINE FUEL OILS - BUNKER RECEIPT

RECEIVING VESSEL | DOCK / PORT | DATE
☒ MV
VESSEL IMO NUMBER | ACCOUNT | Barge PB 12 / Barge PB 20 / Barge PB 32 / Barge PB 34
LOCAL AGENTS

ISO 8217		MDO (DMB)	MGO (DMA)
DENSITY @ 15 C.	0.972		0.813
GROSS MEASURED QUANTITY	1.253.200		82.245
AVERAGE TEMPERATURE	46 °C	°C	30 °C
TEMP. ADJ. COEFFICIENT	0.9775		.9552
NET LITRES @ 15 C.	1.225.000		81.275
DELIVERED QUANTITY IN METRIC TONS	1.200 MT		70 MT
FUEL PROPERTIES			
VISCOSITY (Cst) @ 50 °C	355		3.2
SULPHUR (% by wt.)	1.992		0.94%
B.S. or W (% by vol)	0.1%		Nil
FLASH POINT (PMCC)	70+ °C	°C	70+ °C
POUR POINT	-14 °C	°C	-14 °C
API GRAVITY @ 60 °F.	13.2		32.7

BARGE
ARRIVED — DATE — TIME 1330
MADE FAST — DATE — TIME 1245
BEGAN PUMPING — DATE — TIME 12:55
FINISHED PUMPING — DATE — TIME 18:00
TOTAL PUMPING TIME — HRS. — MIN.

REMARKS
We certify that the bunker fuel oil delivered meets the requirements of regulations 14 and 18 of Annex VI of MARPOL 73/78.

SAMPLE SEAL NUMBERS: MEO 11.550 SHIP 15 SHIP 16 BARGE 15 BARGE 1
☑ YES ☐ NO SHIPS ENGINEER INVITED TO WITNESS SOUNDINGS
☑ YES ☐ NO SHIPS ENGINEER WITNESSED SOUNDINGS
☑ YES ☐ NO REPRESENTATIVE SAMPLE(S) OF THIS DELIVERY PASSED TO SHIPS ENGINEER.

THE QUANTITIES DELIVERED WERE CALCULATED ON THE BASIS OF THE MEASUREMENTS OF THE SUPPLIERS TANKS OR METERS. TAKEN BEFORE AND AFTER THE DELIVERY AND WILL BE CONTROLLING. THEY WILL NOT BE ADJUSTED BASED ON ULLAGES OF THE VESSELS TANK.

I CERTIFY THAT THE QUANTITY AND QUALITY OF THE MARINE FUELS AS SPECIFIED ABOVE HAVE BEEN DELIVERED TO THE VESSEL IN GOOD CONDITION.

BY
TITLE
BY

Figure 6-Bunker Receipt Example

Oily Water Separator (OWS) General information:

Large cruise ships have installation(s) to treat oily water/oily bilge water /sludges and other waters that may contain oil. These vessels have dedicated "oily water" installations onboard. These installations separate the oily substances from the water.

Applying simple logic to these systems- "what goes in goes out" will greatly assist in assessing operation of these installations.

The guidebook, daily report and OR job aid list includes check items for this subject. A bullet list is included below with "attention points" that may be helpful to understand the installations better and to assist in the compliance verification.

Please note many of the OWS checks are in the Seasonal Report. This is to allow a more-in depth look at the OWS items that should not change regularly. These seasonal checks need to be re-done if there is major maintenance or piping changes to the oily water separation system. The OWS system can be a dynamic process, and it is possible that there will be changes during the Alaska cruise season.

Oil Water Separation systems on board Alaska Trade Cruise vessels:

General:

All Alaska trade vessels have Oil Water Separation Systems onboard. The main components are:

- Pre-treatment system: Collection tanks that are laid out for the settling process and/or combination of centrifuges for separation of oily water.

Attention Points:

- Pre-treatment systems are multiple tanks dedicated pre-treatment tanks? How are they arranged? Including the transfer system to OWS system.
- Pre-treatment storage system, check tanks connections and plumbing to the OWS treatment. Check for locked valves / blind flanges and other piping arrangements.
- Are oil skimming arrangements used / installed in the pre-treatment system? How is the skimmed oil handled?
- Are portable pumps / hose arrangement used? If so identify from which area (source) to which tank the flow goes.
- OWS system is in all cases equipped with recirculation / by pass (non discharge line) system, where is the re-circulation / reject medium stored?
- Overflow provisions of the pre-treatment (settling tanks etc) where are the overflows going to?

Figure 7: An example of MarinFloc® WBS (White Box System)

- Are chemicals additives used in the pre–treatment process?
- Medium transfer records (volume change data time) of the pre treatment system available.

Oil Water Separation process components:

- OWS Dynamic process (centrifuges) can be standalone with OCM or combination of other components.
- OWS static process (filter)
    - Components in the White Box System (WBS)(see Picture):
    - Discharge monitoring Oil Content Monitoring (OCM) system / controls.
    - Three way valve system activated by discharge monitoring (open (overboard); close (recirculation) and flow and other controls monitoring
    - The WBS unit is in "locked cage" with key / tagging locking regime.
    - Calibration records

Note that on all vessels the monitoring system on the OWS units is sealed and protected. On some vessels there are video cameras installed to monitor anybody that is working close to the White Box

system. The layout of the WBS with the recirculation valve and controls of the OCM system are on most vessels protected by a cage.

- Inside the WBS system you see the data recorder, this recorder has local read –out and data storage. On most vessels is the WBS data recorder interfaced with the ABB / Siemens / Valmarine automation systems and data recorders / data storage is made as well.

OWS / OCM system:

- Familiarize yourself with the system main components.
- From which tanks is the OWS system processing?
- OCM system is locked /dedicated responsible person?
- Is the OCM system automated?
- The OCM system included alarm and three way valve "open / close" functions.

Figure 8: Example Large Vessel OWS / White Box System

- Sample line from main discharge line to the OCM system. This is a small diameter line from the "inlet side "of the three way valve to the analyzer. This sample line is relatively short and has no valves / cocks.
- To discharge, oil ppm level are recorded this can be done:
    - Check "Writer card" / "strip charts". From previous years feedback it appears that not much large vessels use the "writer / strip card option".
    - Electronically / stored in the White box / relayed to the engine control room repeater system.
    - OCM data Read outs? Memory read out how is this done?
    - Recent alarms? Check alarm information time date equipment line item complete / in printed-out format?
    - OCM system data can be read out local; however this requires to open the "white box cage". In order to do so the responsible officer and C/E have to witness the opening and the reason for the opening. Some vessels do this for routine operations. This is the opportunity for the OR to witness.
    - Is memory storage history of "open box" Close box available? Ask for demonstration?
    - Are cards hard discs / repeater printing outs made of the OCM system?
- Some vessel had a defective (under repair) closed "sealed" OWS unit. Check the paperwork and the reporting to the USCG (when in USA waters).
- General condition of the three way valve, activator lines (pneumatic / electronic) attached? Electric cabling.
- Piping from the last stage OWS / OCM is relatively small diameter are bypassed or blind flanges installed? Some vessels made modifications Describe / check.
- In 2012 it was found that some seals made of tape came loose. Please bring this to the vessels attention and report.

OWS Citations:

33 CFR 155.370 Oily mixture (bilge slops)/fuel oil tank ballast water discharges on oceangoing ships of 10,000 gross tons and above and oceangoing ships of 400 gross tons and above that carry ballast water in their fuel oil tanks.

(a) No person may operate an oceangoing ship of 10,000 gross tons and above, or any oceangoing ship of 400 gross tons and above, that carries ballast water in its fuel oil tanks, unless it has—

(1) Approved 15 ppm oily-water separating equipment for the processing of oily mixtures from bilges or fuel oil tank ballast;

(2) A bilge alarm; and

(3) A means for automatically stopping any discharge of oily mixture when the oil content in the effluent exceeds 15 ppm.

(4) For equipment installed after 2004 to be approved under paragraph (a) of this section, it must meet current standards in 46 CFR part 162, subpart 162.050 by the date set forth in paragraphs (a)(4)(i) and (a)(4)(ii) of this section, unless the equipment is installed on a ship constructed before 2005 and it would be unreasonable or impracticable to meet those current standards.

(i) A ship entering international service for the first time since 2004, must comply with the requirements of paragraph (a)(4) of this section by the date of its initial survey prior to receiving its International Oil Pollution Prevention (IOPP) certificate.

(ii) Any ship, other than a ship described in paragraph (a)(4)(i) of this section, must comply with the requirements of paragraph (4) of this section by the date of the ship's first drydock after October 13, 2009.

(b) No person may operate a ship under this section unless it is fitted with a tank or tanks of adequate capacity to receive the oil residue that cannot be dealt with otherwise.

(1) In new ships such tanks shall be designed and constructed to facilitate cleaning and the discharge of the oil residue to reception facilities. Existing ships shall comply with this requirement as far as reasonable and practicable.

(2) Tanks used for oily mixtures on ships certificated under 46 CFR Chapter I shall meet the requirements of 46 CFR 56.50-50(h) for isolation between oil and bilge systems.

(c) No person may operate a ship under this section unless it is equipped with a pipeline to discharge oily mixtures to a reception facility.

(d) This section does not apply to a barge that is not equipped with an installed bilge pumping system for discharge into the sea.

(e) This section does not apply to a fixed or floating drilling rig or other platform, except as specified in § 155.400(a)(2).

33 CFR 155.380 Oily water separating equipment and bilge alarm approval standards.

(a) On U.S. inspected ships, oily water separating equipment and bilge alarms must be approved under 46 CFR 162.050.

(b) On U.S. uninspected ships and foreign ships, oily water separating equipment and bilge alarms must be approved under either 46 CFR 162.050 or MARPOL 73/78 Annex I.

Figure 9: Example of pre-treatment system component "Sludge" concentration trunk tank

Figure 10: OWS separator (dynamic)

Figure 11: OWS separator / sludge treatment (dynamic) "concentrator"

Figure 12: OWS Piping Example

Figure 13: Example OWS

— EXAMPLE SERVICE REPORT
VERIFICATION OWS / OCM.

TMS
Total Marine Solutions Inc.
4350 Oakes Road, Suite 502
Fort Lauderdale, Florida 33314
Phone: 954-327-2032
Fax: 954-252-3990
info@totalmarinesolutions.com

Certificate Number: 08-12426

Date of Verification: April 19, 2010

Valid For: ☐ 3 Months ☐ 6 Months ☒ 1 Year

Verification Certificate

ADEC N!

Issued To: MV Ethan

☒ Oil Content Meter

This is to verify that the oil content meter specified below, has been tested using known solutions and adjusted in accordance with the manufacturer's instructions and has been found to be within the approved calibration limits.

Equipment	Manufacturer	Model #	Serial #	Alarm Set Point ppm	Time Delays seconds	Install On/At
Oil Content Meter	Deckma	OMD-21	212329	A1 15 ppm A2 15 ppm	T1 10 sec T2 1 sec	White Box

Total Marine Solutions Inc. is an authorized service representative for the manufacturer. This authorization covers servicing, verification and repair work, including alarm point adjustment.

☒ Recorder

This is to verify that the recorder referenced below has been checked and the values produced match, within acceptable limits, those of the oil content meter(s) to which it is attached.

Equipment	Manufacturer	Model #	Serial / Instrument #
Recorder	Eurotherm	5100V	24832

Service Engineer Name: **Service Engineer Signature:**

Figure 15- OWS Verification Example

Service Report
Whitebox

Date: [illegible]
Port: -
Vessel:
IMO No:
Owner:
PO#:
Type of Service: Preventative Maintenance
SO#:
Engineer: -

White Box System Performance Checks: Serial #: 50[illegible] Found: Locked Flow Meter Reading: 05305M3

Initial discussion with vessel delegate any recent challenges	No Challenges	Check 3-Way valve for proper operation and test for leaks	Working	3-way valve pos. switch:	Working
Flow Switch sealed:	Yes	Test technical Water Line for proper operation	Working	Push button for rinse:	Working
Door switch device:	Working	Type of diff. pressure valve:	Spring loaded (non-return)	Type of spring:	Not Checked
Function of diff. pressure valve:	Working	Air Filter Installed	Yes	Flow Switch Setting	.5 LPM
Port state inspection valve "107(49)":	Yes	Flow switch type:	Marinfloc	If Marinfloc flow switch:	Relay Installed
Check flow switch electrical contact and ensure it is sealed	New type N/A	Is the strainer installed over the flow switch	Yes	OCM Dessicator:	Replaced
Check flow switch for operation, cleanliness & operational light	OK	Whitebox vibrations (supports / Bracing):	Supported to satisfaction		

Recorder:

Manufacturer: EUROTHERM Model #: 6100A GPS Feed into the recorder? No
Serial # - GPS Brand/model, if present: Not applicable
Instrument# 57418 Check GMT Time: Yes
Recorder Location: ECR
Retained copy of data for review: Yes
Note Software Version, DRAM and BoardVersion: 4.2.3/64Mb/3
General Appearence of White Box on Arrival: Unit was free of leaks, however corrosion was found on the chemical injection port, same was changed out.

Figure 14: OWS Service Report

System Performance Check: Serial #: 0082 Flow Meter Reading: 09306M3 Discharge Rate (Lpm): 16 Discharge Rate M3/hour: 0.96

Feed pump:	Checked	Oil detector:	Not Checked	Dosage pump:	Checked
Dosage inject. nozzle:	Checked	Low level switch:	Checked	High level switch:	Checked
Overfilling:	See comment	Flocking & sample:	Checked	Pre-drain:	Not applicable
Discharge pump:	Checked	Condition of anodes (%):	75 40 20	Level of filter material (%):	100 100 90
Ballorex valves	See comment	Back flush pressure switch:	Working	Sludge valves:	Checked
Back flush temp.:	OK	Back flush flow:	Checked	Flow switch conditions:	Checked
Flow switch flow:	Checked	Flock Test:	Clear	Flocculent chemical:	Checked

Operating pressure parameters:

Oil descaler: 2.5 Filter No. 1 2.4 Filter No. 2 2.2 Filter No. 3 1.8

Settings:

Temp. bilge water: (if adjustable): 40-50C Filing time: 1.2H Back flush pressure switch: 4.0
Type of PAC: UNITOR BWT PAC dosing pump: Stroke length (%) 75 Strokes /min 70
PPM meter settings: To overboard less than: 5 Time delay overboard to return: 0 PPM shut down and alarm to ECR: Greater than: 5 Time delay: 10

Timer settings:

	T1		T2		T3		T4		T5
Overflow floc tanks:	12	Floc time:	3H	Drain floc tanks:	7M	Back flush filter 1:	8M	Back flush filter 2:	8M
	T6		T7		T8		T9		T10
Back flush filer 3:	8M	Pressure switch delay:	10S	Low level delay	MIN	Oil detector delay:	4S	Pre drain floc tanks:	-

TMS
Total Marine Solutions Inc.

Service Report
Marinfloc TD

Date: June 27, 2010

Oil Content Meters Any Spare Meters? Yes
Verification Check:
Note: When using a Deckma OMD 21 or OMD 2005 oil content meter, it is Alarm 2 which controls the position of the 3 Way Valve.

Model #	Serial #	Certificate Number
OCD-CM	1067802867	12-14249

Recorder:

Model #: 6100a Instrument # 57418
Serial # - Check GMT Time: Yes
Key Code: F6DD-WDUF Paper Speed 19FH
Board Rate, DRAM, Software Version: 4.2.3/64Mb/3 Check Paper & Pens: -
Recorder Comments: Recorder found to working properly

Maintenance Related Comments:

Pressure Differential: pressure drop between filters is normal
Media Level Filter #1: Filter #1 is filled to appropriate level.
Media Level Filter #2: Filter #2 is filled to appropriate level.
Media Level Filter #3: Filter #3 is filled to appropriate level.
Anodes: Sacrificial anodes may require replacement prior to next scheduled service date.
Temperatures: Influent should be no more than 60C while backflushing water should not exceed 70C
Filter Pressures: Filter Step Pressures should not exceed 4.0 bar under normal operating conditions.

General comments:

The OCM attached to MAB#1 was found to not have a manufacturer's S/N Tag, same should be applied. The unit had calibration and alarms verified and a certificate was issued. During operation of the unit it was found that the Floc Tanks were not overfilling, therefore the overfill time was increased to 12 minutes for same to be obtained. Valves 14 and 27 were both found to be leaking. In order for them not to leak the discharge rate cannot be greater than .98M/Hr. Reccomend for the Ballerx Valves to be changed out, same to enable a higher discharge rate.
MAB #1 was successfully run to the Clean Bilge Tank, producing and effluent of "0 PPm". Unit was left in fully operational condition.

Spares Used:

Quantity	Part # / Description	Quantity	Part # / Description

Chief Engineer: EO:

Service Engineer Signature: **Vessel Representative Signature:**

Subsection 1: Oil Pollution; Fuel, Daily (40 CFR 110.3 and AS 46.03.740)

Note: Citations can be found under the general citations in this section, unless specific to that item then they are listed with the item.

►Tip: in 2015, Ocean Rangers reported "soot" floating "soot balls" and "oily specks" from exhaust gas scrubber discharges. The exhaust scrubber has relatively a large discharge volume. Systems upsets, transient loads, not well functioning scrubber components may cause the discharge of soot and oil etc in the scrubber effluent. Often these discharges of oil soot are not continuous and show up on the surface of the discharge area.

►Tip: For vessels equipped with "open loop" scrubbers, there may be "process chemicals " used to support scrubber oil / soot / particle separation process.

►Tip: Some vessel record their low sulfur fuel bunkers in separate recording system. Not all vessel record this in the ORB.

Job Aid Item: 7.1.a

Text: Spills and sheens are absent IAW AS 46.03.740 and 40 CFR 110.3

Background: Sheens and oil spills are prohibited under state and federal law.

What to check: Check for sheens and spills while boarding vessel, at the dock, or when outside. Oil sheens, oil fill ups and leakage of oil in the vessel self (interior) and at the exterior. Vessel use of bow thrusters, and maneuvering appear to be operational conditions where oil sheens from leaky seals are manifested first. Check for the exterior parts of oil systems (tanks, tubes) that no oil is lost or leaking. For seals under the water line (prop shafts, stabilizers) leakage may be noticed under certain operation conditions. Most oil leakages from seals with traditional oils (not including "no sheen oils" such as Vickers B series, CITGO No sheen etc.) will manifest visible sheens. However the oil loss from leaking seals can be very small and hard to detect. Operational condition such as shaft speed and thrust fluctuations can affect the leaking profile as well. Shaft seals may not leak at all at zero shaft speed, but leak at certain shaft speeds. Leaking "inner shaft seals" are indicators that something is wrong with the seals and may indicate future issues with the outer seals. EPA VGP require the use of Environmentally Acceptable Lubricants (AEL) used in "oil to sea interfaces". The interfaces are, Controllable Pitch Propellers, Thrusters, Azipods, Rudder bearings, stabilizers, stern tubes etc. If EAL's could not be used for technical reasons etc. documentation is on board that include why the EAL could not applied.

Job Aid Item: 7.1.b

Text: Vessel Oil Discharge Record Book is up to date IAW 33 CFR 151.25(h). The Oil Discharge Record Book must contain entries for each discharge (including automated discharge) and offload including OWS discharge events IAW 33 CFR 151.25(d)

Background: See Oil Record Book and OWS description under general information.

What to check: Oil Record Book is up to date and filled in as operations are conducted. Check alarm logs and automated logs for OWS items or other discharges not listed in ORB or WW log.

Job Aid Item: 7.1.c

Text: The Oil Discharge Record Book contains entries for each OWS alarm IAW 33 CFR 151.25

Background: See ORB description under general information.

What to check: Alarm logs for OWS items or other discharges not listed in ORB or WW log.

Job Aid Item: 7.1.d

Text: Oil Discharge Record Book contains entries for each internal transfer for cleaning or ballasting of fuel tanks IAW 33 CFR 151.25(d)

Background: See ORB general info.

What to check: Check that the ORB includes internal transfers.

- Do the entries add up?
- Off loads of oil / used lubrication oil must also reported in the offload reporting.
- Bunkers actions up to date filled in? Volume? Type / Quality of the fuels? Bunker receipt? Fuel sample analysis?
- Check how are volumes calculated and determined. Are procedures in place?

Job Aid Item: 7.1.e

Text: Head tanks levels for "oil to sea interface" indicate no oil loss into the sea (e.g. shaft seals, stabilizer systems, thrusters etc.) IAW AS 46.03.740 and 40 CFR 110.3

Figure 16: oil to sea seal/gravity tanks

Background: Familiarize yourself with the "oil to sea" system. Some vessels have rather complicated oil to sea seal systems. Small volumetric changes happen based on temperature changes. Loss of oil may be noticed when tank levels dropped below the sight glass or sight glass mark. Often a tank level alarm is installed and activated when low levels are encountered. Often crew "estimate" the oil added by using hand oil can volumes or using dipsticks or measure on the sight glass the new level or level increase after the "fill up". Some vessels have had water ingress, or leaking internal seals. These could be precursors or are already indictors of "sea water" side shaft seal troubles. Some operators separate and recycle the oil, adding new oil. Monitoring the added oil and "oily water sludge" volumes are good indicators of how much oil is added. The internal leak volume should be accounted for.

What to check: Check levels under several operation conditions, seas, port, maneuvering etc. Are the tank valves open during the vessel operation? Are the tank valves intermittently closed or opened? Check how are the tanks are filled up and kept on level. How is it established when the oil fill up in the tanks? Is overflow piping connected to the tanks? Check for presence of air pumps / hoses / oil drums in the vicinity of the tank system. Are levels of oil tanks recorded in alarm log? Engine room logs? What is the history of the item? Log books / recording where are the oil changes / fill ups recorded? What type of oil is used? Is an oil switch made compared to the previously used oil? How is the "consumed" oil volume determined?

►Tip: attention to the EAL use and in which equipment this type of lubricant is used. Lubrication / Oil card identification? Oil / Lubricant EAL type on tanks signs?

Subsection 2: Oil Pollution; Oily Water Separators (OWS) (33 CFR 155.360 /370, 33 CFR 151.10)

Note: Citations can be found under the general citations in this section, unless specific to that item then they are listed with the item.

Job Aid Item: 7.2.a

Text: Changes to the OWS or OWS piping, make sense IAW 33 CFR 151.10

Background: Changes or alterations of piping are possible indicators of "magic piping" and the OWS was not used for oily water discharges. There are more in-depth checks on this in the seasonal report. This item is meant as an update to the seasonal in-depth checks, to see if any changes have been made since then. The seasonal report could be a useful reference for this.

What to check: OWS status in general. Scraped nuts bolts head, missing washers and fresh fixed piping are suspect. Also blind flanges, connectors and hoses are possible indicators of non-original (as built) OWS discharge piping lay out. Compare the system with as built drawing and trace the piping. Ask questions. New pipe sections, flexible sections and blind flanges / spectacles (combined blind flange / open flange pieces) can be suspect. New paint can be present, but check if other changes were made that could be hidden by paint.

Job Aid Item: 7.2.b

Text: OWS units are processing from a contaminated source, if OWS is in use IAW 33 CFR 151.10

Background: The OWS is used to process "oily water" and bilge water. Vessels that burn oil will have oily sludges. In order to make sure that the oily wastes are discharged correctly an OWS system must be used and operable.

What to check: Operable OWS system including associated systems, tanks etc. Familiarize the entire system and how the system is operated. Checks for OWS piping, storage tanks and how the "influent" is processed and where it originated from.

Job Aid Item: 7.2.c

Text: Oil content meters have similar or same readings on units with multiple oil content meters IAW 33 CFR 151.10

Background: OWS oil content metering should be functional with the set parameters (calibrations).

What to check: If multiple oil content meters installed the meter should give similar reading over the same sample flow. Calibration records should include the oil content meter checks and findings including the calibration actions and ranges. Recordings monitoring results of the readings?

Job Aid Item: 7.2.d

Text: Sample analyzed by OWS meter is from OWS discharge IAW 33 CFR 155.370(a) and 33 CFR 151.10

Background: OWS treated flow should be the flow which is used for "compliance" measured oil content.

What to check: The treated flow outlet from OWS to the discharge is sampled by the OWS oil content meter. Ensure sample analyzed by OWS meter is OWS output (trace sample line for presence of unacceptable clean water connection) Piping in place to the meter.

Job Aid Item: 7.2.e

Text: Oil dispersants are not used in oil tanks or lubrication systems IAW 40 CFR 110.4 and VGP 2.2.9

Background: Oil dispersants could remove a sheen, when oil is still being discharged to waters. Some emulsifiers could be used to cause oil or grease to sink instead of float, which reduces the likelihood of an oil loss being detected. It also creates more difficult conditions for clean-up.

What to check: Check for dispersants added to oil tanks or lubrication systems such as shaft seals. Check when tanks are filled. Check for possible "chemical" dosing systems. Not to be confused with the cleaning system of the OWS itself.

Citations: 40 CFR 110.4 Dispersants.
Addition of dispersants or emulsifiers to oil to be discharged that would circumvent the provisions of this part is prohibited.

EPA VGP 2.2.9 Controllable Pitch Propeller and Thruster Hydraulic Fluid and Other Oil-to-Sea Interfaces Including Lubrication Discharges from Paddle Wheel Propulsion, Stern Tubes, Thruster Bearings, Stabilizers, Rudder Bearings, Azimuth Thrusters, Propulsion Pod Lubrication, and Wire Rope and Mechanical Equipment Subject to Immersion

- The protective seals on controllable pitch propellers, azimuth thrusters, propulsion pods, rudder bearings, or any other oil-to-sea interfaces must be maintained in good operating order to minimize the leaking of hydraulic oil or other oils. The vessel owner/operator must not discharge oil in quantities that may be harmful as defined in 40 CFR Part 110 from any oil-to-sea interface. If possible, maintenance activities on controllable pitch propellers, thrusters, and other oil-to-sea interfaces should be conducted when a vessel is in drydock.
- Minimize maintenance activities on stern tube seals when a vessel is outside of drydock. If maintenance or emergency repair must occur on stern tubes or other oil-to-sea interfaces which have a potential to release oil in quantities that may be harmful as defined in 40 CFR Part 110, appropriate spill response equipment (e.g., oil booms) must be used to contain any oil leakage. Operators of the vessel must have ready access to spill response resources to clean up any oil spills.
- After applying lubrication to wire rope and mechanical equipment subject to immersion, wire ropes, and other equipment must be thoroughly wiped down to remove excess lubricant unless doing so is deemed unsafe by the Master of the vessel.
- All vessels must use an EAL in all oil to sea interfaces, unless technically infeasible. "Environmentally acceptable lubricants" means lubricants that are "biodegradable" and "minimally-toxic" and are "not bioaccumulative" as defined in Appendix A of this permit. For purposes of requirements related to EALs, technically infeasible means that no EAL products are approved for use in a given application that meet manufacturer specifications for that equipment, products which come pre- lubricated (e.g., wire ropes) have no available alternatives manufactured with EALs, products meeting a manufacturers specifications are not available within any port in which the vessel calls, or change over and use of an EAL must wait until the vessel's next drydocking.
- If a vessel is unable to use an EAL, you must document in your recordkeeping documentation consistent with Part 4.2 why you are unable to do so, and must report the use of a non-environmentally acceptable lubricant to EPA in your Annual Report. Use of an environmentally acceptable lubricant does not authorize the discharge of any lubricant in a quantity that may be harmful as defined in 40 CFR Part 110.
- EPA recommends that all new build vessel operators endeavor to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment.

Job Aid Item: 7.2.f

Text: OWS system and OWS meters are free of obvious electrical bypasses, jumpers, extra switches on unit or meter control panel IAW 33 CFR 155.370(a)) and 33 CFR 151.10

What to check: Check for any unusual connections on or around the meter control panel that could bypass the system or provide false or inaccurate readings. Observe if there are obvious electrical bypasses, jumpers, extra switches on unit or meter control panel.

Citations: 33 CFR 155.370 Oily mixture (bilge slops)/fuel oil tank ballast water discharges on oceangoing ships of 10,000 gross tons and above and oceangoing ships of 400 gross tons and above that carry ballast water in their fuel oil tanks.

(a) No person may operate an oceangoing ship of 10,000 gross tons and above, or any oceangoing ship of 400 gross tons and above, that carries ballast water in its fuel oil tanks, unless it has—

(1) Approved 15 ppm oily-water separating equipment for the processing of oily mixtures from bilges or fuel oil tank ballast;
(2) A bilge alarm; and
(3) A means for automatically stopping any discharge of oily mixture when the oil content in the effluent exceeds 15 ppm.
(4) For equipment installed after 2004 to be approved under paragraph (a) of this section, it must meet current standards in 46 CFR part 162, subpart 162.050 by the date set forth in paragraphs (a)(4)(i) and (a)(4)(ii) of this section, unless the equipment is installed on a ship constructed before 2005 and it would be unreasonable or impracticable to meet those current standards.
(i) A ship entering international service for the first time since 2004, must comply with the requirements of paragraph (a)(4) of this section by the date of its initial survey prior to receiving its International Oil Pollution Prevention (IOPP) certificate.
(ii) Any ship, other than a ship described in paragraph (a)(4)(i) of this section, must comply with the requirements of paragraph (4) of this section by the date of the ship's first drydock after October 13, 2009.

Job Aid Item: 7.2.g

Text: OWS has automatic re-circulate (3 way valve) or it shuts down when > 15 ppm. Valve is operated properly IAW 33 CFR 155.370 a(3))

What to check: Understand the three-way valve pipe connections and re-circulation system / tank system. How is the three-way valve activation done? How is the valve operated? Are safeties in place when air pressure / electric failure occurs to the valve (Normally closed?). Are valve activation controls bypassed or feed by outside (non OWS) source? Visually observe that there is an automatic re-circulate (3 way valve) or shuts down when > 15 ppm. Observe proper operation of valve in use.
Citations: See 7.2.f.

Job Aid Item: 7.2.h

Text: System back flush or oil purge cycle (if used) properly operates IAW 33 CFR 155.370(a)

Background: OWS functional check. In order to make sure that the oily wastes are discharged correctly an OWS system must be used and operable. These items are most likely to be witnessed when the OWS is operated.
What to check: Observe for proper operation of system back flush or oil purge cycle if in use. When back flush is performed, monitor check system parameters controls. Where is the back flush routed too? Are the operational mode displayed? Is the purge cycle working?
Citations: See general OWS information.

Job Aid Item: 7.2.i

Text: Processed water is free of gross contamination (sheen or visible oil) IAW AS 46.03.740 and 40 CFR 110.3

Background: Gross contamination is in fact a malfunctioning OWS. The OWS discharge is on most large vessels under the water line and may be hard to witness sheens (if any).

What to check: Visually observe processed water for gross contamination (sheen or visible oil) during operation of OWS. The oil content meter should provide alarms if there is a sheen.

Job Aid Item: 7.2.j

Text: Vessel has no indications of OWS bypasses or direct discharges of oil IAW 40 CFR 110.3

Background: This is a general check of connections that could bypass the OWS and/or directly discharge oily water overboard. Pumps and hoses could also be an indication the OWS is not properly operating, and additional tanks are being used to store poly water.

What to check: Check for out of place hoses, portable pumps, open man holes, fittings and connections in areas with stored oil or oily wastes that were not included in the design of the vessel. Check for hoses between tanks, unusual connections, portable pumps, etc of unknown use and origin. Check for connections to bilge or overboard.

Citations: See general oil background section.

Subsection 3: Bilges (33CFR155.770)

General background: Oil or hazardous materials in a bilge are a potential source of pollution if not properly treated. Even if properly treated, too much waste could reduce the effectiveness of treatment. Some materials could be put into the bilge that equipment is not designed to handle- such as from the wastewater system. Large amounts of oil or hazardous waste has been identified by Ocean Rangers as a possible safety hazard when fumes or vapors accumulate.

General Citation: 33 CFR 155.770 Draining into bilges.

No person may intentionally drain oil or hazardous material from any source into the bilge of a vessel.

Job Aid Item: 7.3.a

Text: Machinery bilge spaces free from excess contamination of oil or hazardous materials IAW 33CFR155.770

What to check: Check machinery bilge spaces for contamination with oil or hazardous materials. Check for sheens, sludge, odd odors, or unusual stains.

Job Aid Item: 7.3.b

Text: Bulkheads, piping, structures, within rose boxes free from excess contamination/oil residues IAW 33CFR155.770

What to check: Check for sheens, sludge, odd odors, or unusual stains.

Job Aid Item: 7.3.c

Text: Machinery free of excess oil leakage (e.g. boiler water blow down/wash waters) IAW 33 CFR155.770

What to check: Check for leakage from systems and engines into machinery spaces (e.g boiler Water blow down / wash waters?) Check for sheens, sludge, odd odors, or unusual stains.

Job Aid Item: 7.3.d

Text: Bilges are free from direct discharge into the bilges of oil or hazardous materials IAW 33 CFR155.770

What to check: Check on oil usage, quantities, where lost, consumed or in bilges. Check for direct discharge of oil or wastes into bilges. Check oil record book and other sources for information for amounts of oil lost into bilge and recovered sludge/oily water.

Job Aid Item: 7.3.e

Text: Oily water separator and related equipment free from detergent used to remove appearance of sheen IAW 40 CFR 110.4 and VGP 2.2.2

Background: Dispersants used in the bilge or oily water separator could interfere with the effectiveness of equipment removing oil. This could allow oily water to be discharged.

What to check: Check for detergent use in or near bilges and OWS equipment. Like chemicals / dosing equipment and other suspect liquids and chemicals / additives.

Citations: **40 CFR 110.4 Dispersants.**

Addition of dispersants or emulsifiers to oil to be discharged that would circumvent the provisions of this part is prohibited.

EPA VGP 2.2.2 *Bilgewater/Oily Water Separator Effluent*

All bilgewater discharges must be in compliance with the regulations in 40 CFR Parts 110 (Discharge of Oil), 116 (Designation of Hazardous Substances), and 117 (Determination of Reportable Quantities for Hazardous Substances) and 33 CFR §151.10 (Control of Oil Discharges). In addition:

• Vessel operators may not use dispersants, detergents, emulsifiers, chemicals, or other substances that remove the appearance of a visible sheen1 in their bilgewater discharges. This requirement does not prohibit the use of these materials in machinery spaces for the purposes of maintaining or cleaning equipment.

• Except in the case of flocculants or other required additives (excluding any dispersants or surfactants) used to enhance oil/water separation during processing (after bilgewater has been removed from the bilge), vessel operators may not add substances that drain to the bilgewater that are not produced in the normal operation of a vessel. The use of oil solidifiers, flocculants, or other required additives are allowed only as part of an oil water separation system provided they do not alter the chemical make-up of the oils being discharged and any discharge of such materials into waters subject to this permit must be minimized. Routine cleaning and maintenance activities associated with vessel equipment and structures are considered to be normal operation of a vessel if those practices fall within normal marine practice.

• All vessels must minimize the discharge of bilgewater into waters subject to this permit. This can be done by minimizing the production of bilgewater, disposing of bilgewater on shore where adequate facilities exist, or discharging into waters not subject to this permit (i.e., more than 3 nautical miles [nm] from shore) for vessels that regularly travel into such waters. Though not regulated under this permit, EPA notes that discharges of bilgewater outside waters subject to this permit (i.e., more than 3 nm from shore) are regulated under Annex I of the International Convention for the Prevention of Pollution from Ships as implemented by the Act to Prevent Pollution from Ships and U.S. Coast Guard regulations found in 33 CFR part 151.

• Vessels greater than 400 gross tons shall not discharge untreated oily bilgewater (i.e., bilgewater not treated with an onboard separator or bilgewater with a concentration of oil greater than 15 ppm) into waters subject to this permit.

• Vessels greater than 400 gross tons that regularly sail outside the territorial sea (at least once per month) shall not discharge treated bilgewater within 1 nm of shore if technologically feasible (e.g., holding would not impact safety and stability, would not contaminate other holds or cargo, or would not interfere with essential operations of the vessel). Any discharge which is not technologically feasible to avoid must be documented as part of the requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

• Vessels greater than 400 gross tons shall not discharge treated bilgewater into waters referenced in Appendix G unless the discharge is necessary to maintain the safety and stability of the ship. Any discharge of bilgewater into these waters must be documented as part of the recordkeeping requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

• For vessels greater than 400 gross tons that regularly sail outside the territorial sea (at least once per month), if treated bilgewater is discharged into waters subject to this permit, it must be discharged when the vessel is underway (sailing at speeds greater than 6 knots), unless doing so would threaten the safety and stability of the ship. EPA notes that vessel operators may also choose to dispose of bilgewater on shore where adequate facilities exist. Any discharge which is made for safety reasons must be documented as part of the requirements in Part 4.2 and reported to EPA as part of the vessel's annual report.

Job Aid Item: 7.3.f

Text: Overboard valves on bilge, bilge ballast salt-water service are locked/controlled IAW 40 CFR 110.3

Background: Discharge valves/overboard valves are important for the discharge operations and operating of these valves will possible trigger overboard discharge or not.

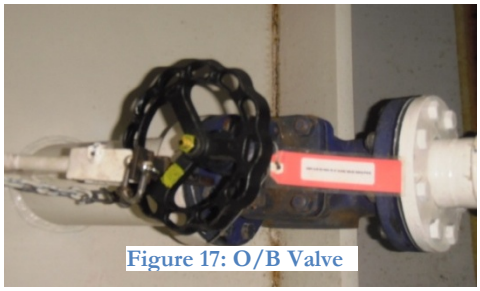


Figure 17: O/B Valve

What to check: Check for unlocked / uncontrolled overboard valves on bilge, bilge ballast salt water service. Identification of the valve (tag) should be of lasting character. Are locking devices in place? Who is responsible for these opening / locking regimes? For manual operated valves how is locking / closing performed and tracked / verified? For remote operated valve how is looking performed and tracked?

Citations: See general section.

Subsection 4: Oil Sludge Handling (33CFR155.370 b)

Job Aid Item: 7.4.a

Text: Sludge and spent lube oils are offloaded or properly destroyed and/or recycled onboard IAW 33 CFR 151.25

Background: Fuel burning ships will produce sludge. A deminimus is used to verify that sludge is produced and should be counted for or demonstrated.

What to check: Check the oil record book and manifests for accepted sludge materials onshore. Check the sludge handling / record keeping for sludge / spent lube oils send shore based facilities (off load). Sludge handling accounted for the volumes reasonably produced. Sludge produced should be accounted for by burning, in tanks, or burned. No offloads of sludge could indicate an issue. Check that estimated quantities of sludge produced- normal or excessive (fuel sludge production can exceed 2% total fuel use).

►Tip: Some vessels are operating in Alaska waters (SOX control area) on low sulfur fuel (distillate). These low sulfur fuel operated vessels may produce significant less fuel sludge that vessels operating on Residual fuels.

Citations: See general section. Oil record book. Avoiding oil in water.

Job Aid Item: 7.4.b

Text**:** Sludge handling and sludge waste incineration process records are properly kept IAW 40 CFR 110.3 and 33 CFR 151.25

Background: Sludge should be accounted for. If combusted the volume accounted for should a reasonable amount. Check that records are properly kept. Some vessels have burned sludge in their boilers, sometimes resulting in poor opacity performance. Most engine manufacturers are not allowing to burn sludge in the engine.

What to check: Is the incinerator suitable to combust sludge? If so co-firing diesel needed? (Diesel fuel consumption log). Are records included up to date for this use? Is the sludge transfer system tank to incinerator system in working order? Check furnace evidence in use for oil sludge. Records of inspections and tests are up to date. If sludge is incinerated, check how metering of the sludge is performed.

Citations: See general section- oil record book.

Job Aid Item: 7.4.c

Text: Sludge is correctly handled when it is blended with fuels and blending is recorded IAW 40 CFR 1043.60 and 33 CFR 151.25

Background: Sludge should be accounted for to show no improper discharge overboard. Burning of sludge must be consistent with federal air regulations regarding NOx and SOx rules.

What to check: Check oil record book and fuel consumption logs. Check record keeping and metering estimates of sludge blends. Check equipment that the fuel /sludge blends (mix) is used.

Citation- see air section.

Subsection 5: Lifeboats; Security Vessels; Tender Boats; Deck (40 CFR 110.3)

Note: Citations found in general citations in this section unless otherwise noted.

Job Aid Item: 7.5.a

Text: Vessel(s) mechanical and bilge systems are free of oil, grease that could enter the water IAW 40 CFR 110.3

Background: Small vessels used by the cruise ship in regular or emergency operations are potential sources of oil to water.

Figure 18: Tenders in action

What to check: water Check lifeboat/tender vessel engineering systems are oil or grease leak & drip free. Check that bilges are clean of excess oil. Visually check when available the bilges of vessels operated by the cruise ship. No direct discharge from bilges to overboard if oil present. Visually check decks under stowed tenders and boats for signs of oil spills or oil stains. Include a visual inspection for greased gobs / drops on decks. Winch equipment containment should be oil free. Some vessels have "outrigger davits" they are hydraulically operated. Check hose connector oil sweating / leaks and containment areas. Also steel rope should be checked for grease gobs and for overfilled rope lubricators.

Job Aid Item: 7.5.b

Text: Oil and grease from topside equipment is handled correctly IAW VGP 2.2.1.

Background: Equipment such as winches and motors used to lower and raise lifeboats and tenders are a potential source or oil or grease into water, either directly running off or during cleaning activities.

►Tip: Pay attention to the oil and lubricant use in the lifeboat systems. In 2015, oil leakages / deck spills were reported. This was related to the repair / maintenance operations. Check regularly on oil / grease items for lifeboat systems.

What to check: Check oil and grease from topside equipment (winches motors etc.). Visually check for oil spills on decks near machinery. If drip pans are available, check that there are procedures for draining and cleaning the pans.

Citation: **EVP VGP 2.2.1 Deck Wash down and Runoff and Above Water Line Hull Cleaning** (first part)

> Vessel owner/operators must minimize the introduction of on-deck debris, garbage, residue, and spill into deck washdown and runoff discharges. Before deck washdowns occur, you must broom clean (or equivalent) exposed decks or use comparable management measures and remove all existing debris. When required by their class

societies (e.g., oil tankers), their flag Administrations, or the U.S. Coast Guard, vessels must be fitted with and use perimeter spill rails and scuppers to collect the runoff for treatment. Where feasible, machinery on deck must have coamings or drip pans where necessary to collect any oily discharge that may leak from machinery and prevent spills. The drip pans must be drained to a waste container for proper disposal and/or periodically wiped and cleaned. Additionally, to reduce the risk of any leakage or spills of harmful oils into the aquatic environment, EPA strongly encourages the use of environmentally acceptable lubricants in all above deck equipment. The presence of floating solids, visible foam, halogenated phenol compounds, and dispersants, or surfactants in deck washdowns must be minimized. Vessel owners/operators must minimize deck washdowns while in port.

Job Aid Item: 7.5.c

Text: Special actions(such as bunkering of tenders) prevent spills and tank overflows, etc. IAW 40 CFR 110.3 and VGP 2.1.3

Background: Procedures / operations should be laid out in such way the spill overflows are prevented. Most of the elements are already integrated in the vessel oil storage handling designs to prevent spills and tank overflows.

What to check: Check if special actions are taken, for example during bunkering fuel oils. In Alaska bunkering activities have increased with the sulfur ECA. Some vessels that used their passenger tender boats frequently in Alaska may fuel up these in Alaska. Check on spill prevention measures, containments, tank level monitoring and how the fuel "bunkering" is done for the lifeboats / tender vessels. Fuel transfers need to be done very carefully. How are tank volumes calculated / measured? Are systems and procedures in place? Are tanks equipped with fuel overflow (captive) systems? Are tank level monitoring alarms in place and operable? Does the overflow tank have level alarms that are operable? Are overflow tank alarms recorded? Is a communication system from deck (bunker station) to other parts of the system (manifold) in place? Are general operation procedures in place?

►Tip: Bunkering low sulfur distillate fuels is done by fuel truck transfer to the vessels. The fuel truck using often portable fuel booster pumps to transfer the fuel from the tank truck to the vessels.

Subsection 6: Oil to Sea Interface (40 CFR 110.3 & AS 46.03.740)

Job Aid Item: 7.6.a

Text: Oil lubricated stern tubes, bow and stern thruster seals, fin-stabilizers, steering gear, Azipods etc. IAW VGP 2.2.9.

Figure 19: Barrel of lubrication oil

Background: Any oil to sea interface is a potential source of oil leaking to seawater. Ocean rangers have reported a number of seal and azipod leaks. These leaks can start out at a small volume and increase over time.

What to check: Check oil lubricated stern tubes, bow and stern thruster seals, fin-stabilizers, steering gear, Azipods etc. Check header tank levels under several operation conditions, seas, port, maneuvering etc. Check records of fill up volumes and frequency. Check for evidence of seawater intrusion into these oil to sea interfaces, such as draining of seawater from systems. The spent oil is counted for and should show up somewhere in the ORB. When the oil is incinerated or off loaded this is also recorded in the ORB.

Citation: EPA VGP 2.2.9 See Job Aid Item 7.2.e

Job Aid Item: 7.6.b

Text: Lube oil consumption, oil records and type of oil used are recorded IAW 33 CFR 151.25

What to check: Check lube oil consumption oil records and type of oil used. In order to detect "consumption trends" check the records back to early in the season. Sudden increase of lube oil in the stern tube may indicate an oil leak. Some vessels keep also records of the oil drum stores, such records are extremely helpful to find out which oils are used on board. Some lubricants are combusted in the diesel engines. A good example is the engines with dedicated cylinder lubrication systems. Another point of attention is the "small engine lube oil changes". Emergency diesels, diesels on the tenders and lifeboats. Monitor how these oil volumes is counted for, recorded, and the handling of the spent oil.

Figure 20: Unknown Hose

Citation: See general section under Oil Record Book.

Job Aid Item: 7.6.c

Text: Mechanical systems with oil to sea interface are free from unusual loss of lubricant IAW 40 CFR 110

Background: Non "first supplied" piping conveyance systems (as built) are suspicious. However, a change of operations may necessitate the use of hosed and temporarily made piping systems. If such system is found document and ask. Portable pumps connected to nipples / re-routing liquids to other tanks should be investigated and found out why. In any case document (pictures) and described the system. In a particular case you may find oil drums (storage) and fill apparatus to keep the oil gravity tanks at level. In case systems should function without regular refilling, the designers most likely did not design in the as built concepts a permanent fill option. If in these cases temporarily or homemade permanent fill options are made a further check is warranted.

Figures 21 and 22: Temporary Oil filtration or pumping system

What to check: Presence of portable pumps, hoses, drums and other equipment / supplies / arrangements necessary to refill systems equipment. Portable pumps, hoses, non shipyard valves welded on connectors and flanges. Hose and connecting parts stored or in place adjacent the system to refill. Different pipe material quality flanging as remainder of the system (yard standard deviation). Poorly routed homemade bends or mediocre welding work on piping. Not properly bracketed piping sections. Drums empty, or filled? How are full drums temporarily tanks drums removed after filled up? What medium is transferred? From which system to which other system? Who operates the systems and when is the system operated? Are records kept? If so what include the records? How are transferred volumes estimated?

OIL & HAZARDOUS SUBSTANCE SPILL NOTIFICATION FORM INSTRUCTIONS

PERSON REPORTING

Name of the person reporting the spill to ADEC.

PHONE NUMBER

Contact number of the person reporting the spill.

REPORTED HOW?
Phone – If you reported a spill during normal business hours. ***Fax*** – If you reported a spill by faxing in the spill report form. ***Troopers –*** If you reported a spill after hours to 1-800-478-9300.

DATE/TIME OF SPILL

Date and time of when the spill incident occurred.

DATE/TIME DISCOVERED

Date and time of when the spill was discovered.

DATE/TIME REPORTED

Date and time of when the spill incident was notified to ADEC.

LOCATION/ADDRESS

Spill incident location.

SUBSTANCE TYPE SPILLED

CR – Crude (Crude Oil)
EHS – Extremely Hazardous Substance (Aldrin, Ammonia<Chlorine, Formaldehyde, etc.)
HS – Hazardous Substance (Acid, Arsenic, Bases, Corrosion Inhibitor, Dioxin, Glycol, etc.)
NC – Non Crude Oil (Aviation Fuel, Bilge Oil, Diesel, Lube Oil, Hydraulic Oil, etc.)
PW – Process Water
UNK – Unknown

PRODUCT SPILLED

Name of the spilled product.

QUANTITY SPILLED

Amount released to the environment.

QUANTITY CONTAINED

Product contained that is recoverable. If 50 gallons of 100 gallon spilled was in a secondary containment (non permeable containment), you would write 50 gallons in this field. If 2 gallons of 5 gallons spill was contained using a boom, you would write 2 gallons in this field.

QUANTITY RECOVERED

Amount of free product that was recovered.

QUANTITY DISPOSED

Amount of free product that was recovered for disposal.

POTENTIAL RESPONSIBLE PARTY

Name/Business – Name of individual or business responsible for the spill incident.
Mailing Address – Mailing address for correspondence.
Contact Name/Number – Name and number of the person who will be the main point of contact for the spill incident.

PRP (POTENTIAL RESPONSIBLE PARTY) TYPE

Select from the list.

FACILITY TYPE Select from the list.

SOURCE OF SPILL

Indicate where the spilled product came from.

SOURCE CLASSIFICATION
Select from the list.

CAUSE OF SPILL
Indicate what caused the spill incident.

CAUSE CLASSIFICATION Select from the list.

CLEANUP ACTIONS

Describe action taken to cleanup the spill.

DISPOSAL METHOD AND LOCATION

State how the waste will be handled. If the contaminated items are shipped or taken to another facility, a copy of the waste manifest must be submitted to ADEC.

SURFACE AREA AFFECTED

Indicate the size of affected area (e.g. 20 x 20 ft).

SURFACE TYPE

Describe the surface that was impacted by the discharge (e.g. Wide Bay, asphalt, gravel, snow, etc.).

Vessel Once a Season Report

This checklist includes items that Ocean Rangers monitor once per cruise season. Once verified these items should not change significantly during the cruise season. The department has determined that monitoring and recording the items on this checklist one per season should provide sufficient oversight to confirm environmental compliance for the cruise season. It should reduce the time required by Ocean Rangers to monitor, and make the time available for Ocean Rangers to monitor items that are more dynamic. Changes that the vessel makes that affect items on this checklist may make a re-check of those items necessary.

Ocean Rangers. The first Ocean Ranger assigned to a voyage on a vessel shall complete the seasonal checklist. Recordkeeping on some ships is generally centralized, so this should make the effort taken on the seasonal checklist easier. If there are questions regarding the once a season report, please forward these to your manager to submit to ADEC.
The seasonal report may be completed by section. Upon completion, the Ocean Ranger will submit the completed checklist to the Crowley Program Manager. While completing the seasonal report, the Ocean Ranger shall also provide a daily report with minimal information each day, including daily checks for each section, the information section, and any compliance items noted.

Crowley Program Manager. The Crowley Program Manager shall require one once per season checklist per each vessel operating on more than one Alaskan voyage. Upon ADEC approval of the checklist, the Crowley Program Manager shall make the information contained on the checklist available for each Ocean Ranger that rides the ship during the cruise season.

ADEC Cruise Ship Program. The Cruise Ship Program will review the checklist. If the program requires more information, we will contact the Crowley Program Manager.

Section 1: Wastewater (33 CFR 159, 18 AAC 69.050, Alaska GP, EPA VGP)

Subsection 1: Information

Seasonal Item: 1.1.a
Text: Title of wastewater primary contact:

What to enter: Title of the person who will be the primary contact for wastewater (BW/GW).

Seasonal Item: 1.1.b
Text: Title of ballast water primary contact:

What to enter: Title of the person who will be the primary contact ballast water.

Seasonal Item: 1.1.c
Text: Name of Sewage and Graywater Discharge Record Book (discharge logs) used onboard:
Background: This is information for ADEC and other Ocean Rangers. The official name should be the Sewage and Graywater Discharge Record Book. Vessel crews can use different informal names.

The general permit requires copies of the discharge record books be submitted to ADEC monthly. Some vessels now utilize and electronic recordkeeping system.
What to check for: Enter the name the crew uses for the discharge log. Also enter the printed name on the log if it is different.

Seasonal Item: 1.1.d

Text: Name and locations of instructions or guide to completing (making entries) discharge record book:

Background: This is information to assist ADEC and other Ocean Rangers in reading the discharge logs. These instructions often tell how to fill in- for example to use local time or GMT. An example can be found in the wastewater section of the guidebook.
What to check for: If there are discharge log instructions, record the name of the instructions. Information here will be useful in the recordkeeping section. Check that discharge ports names match those in the VSSP.

Subsection 2: Documentation

Seasonal Item: 1.2.a

Text: MSD International Sewage Pollution Prevention Certificate (ISPPC) or Non-U.S. flag "Certificate of Type Test MARPOL Annex IV" (MARPOL IV / 33 CFR159.7) Y/N:

Background: Cruise ships that have MSD systems must have some type of documentation that these units were certified. The certification could be from the US Coast Guard or from a classification society such as DNV.
What to check for: Check for a placard or documentation that shows the MSD is certified or vessel has a sewage pollution certificate.

Seasonal Item: 1.2.b

Text: Explain how wastewater logs (sewage and greywater discharge record book) are recorded and the process to ensure they are current and accurate:

Background: ADEC has found errors in logbooks, sometimes these errors are easily explained or just a misinterpretation of what was written. Understanding the recordkeeping process will help ADEC review and other Ocean rangers who check logbook entries.
What to enter: Explain the process that discharge logs are completed. Use titles, not names if identify who does each step. How is information collected? When are entries made? How is it entered? How are deviations or mistakes identified?

Seasonal Item: 1.2.c

Text: What time is used in the discharge logs (GMT, local, etc.)?

What to enter: There is no requirement for what time to record in the discharge logs, however there must be consistency. For example- if "local" time is used, is it Alaska or Pacific, and do they change when crossing time zones? Please record what time zone is used.

Seasonal Item: 1.2.d

The next two items include information for onboard record keeping. These checks will allow other Ocean Rangers to quickly find documents needed for reporting. Identify the name and location of the record keeping document for each item with the word "records", "recordkeeping", or "recorded".
Include the ship's name for each logbook, record book, and other related documentation. If the logs are electronic, identify the name and location. If item is not recorded in a dedicated logbook but in another log book, state where it is recorded. (e.g. pulper water in Sewage and Graywater record book). If item is not recorded mark as "No". Some vessels use electronic logs, for these use the same approach as traditional logs.

Note: Many of these items do not have citations. They are regarding information that is helpful for other Ocean Rangers in gathering information, and for ADEC as a reference. Full citations regarding discharge logs can be found in the wastewater section of the guidebook.

Text: Are Wastewater waste-stream discharges recorded and where:

i. Graywater
ii. Sewage (blackwater or mixed)
iii. Permeate (treated wastewater)
iv. Bio sludge
v. Bio solids
vi. Pool, spa and Jacuzzi
vii. Pulper water
viii. Pulper convey water
ix. Dewatering water
x. Boiler/economizer blowdown and washdown (EPA VGP)
xi. Ballast water (33CFR151.070)
xii. Other water sources that could become wastewater

What to enter: For each item, mark if it is recorded, and enter the name or description of the log it is recorded in and location on where to find the records.

Ballast Water Citations:

151.2060 Reporting requirements.

(a) Ballast water reporting requirements exist for each vessel subject to this subpart bound for ports or places of the United States regardless of whether a vessel operated outside of the Exclusive Economic Zone (EEZ), unless exempted in § 151.2015 of this subpart.
(b) The master, owner, operator, agent, or person in charge of a vessel subject to this subpart and this section must provide the information required by § 151.2070 of this subpart in electronic or written form to the Commandant, U.S. Coast Guard or the appropriate Captain of the Port (COTP). The Ballast Water Reporting Form (Office of Management and Budget form Control No. 1625-0069) and the instructions for completing it are available on the National Ballast Information Clearinghouse's Web site at http://invasions.si.edu/nbic/submit.html . Information must be submitted as follows:
(3) For any vessel that is equipped with ballast water tanks and bound for ports or places in the United States and not addressed in paragraphs (b)(1) and (b)(2) of this section: If a vessel's voyage is less than 24 hours, report the required information before departing the port or place of departure. If a voyage exceeds 24 hours, report the required information at least 24 hours before arrival at the port or place of destination. The information must be sent to the National Ballast Information Clearinghouse using only one of the following means:

(i) Via the Internet at http://invasions.si.edu/nbic/submit.html .(ii) Email to NBIC@BallastReport.org (iii) Fax to 301-261-4319.(iv) Mail to U.S. Coast Guard, c/o Smithsonian Environmental Research Center, P.O. Box 28, Edgewater, MD 21037-0028.
(c) If the information submitted in accordance with this section changes, the master, owner, operator, agent, or person in charge of the vessel must submit an amended report before the vessel departs the waters of the United States.
151.2070 Recordkeeping requirements.

(a) The master, owner, operator, agent, or person in charge of a vessel bound for a port or place in the United States, unless specifically exempted by § 151.2015 of this subpart, must ensure the maintenance of written records that include the following information:
(1) Vessel information. This includes the name, International Maritime Organization (IMO) number (official number if IMO number is not issued), vessel type, owner or operator, gross tonnage, call sign, and State of registry (flag).
(2) Voyage information. This includes the date and port of arrival, vessel agent, last port and country of call, and next port and country of call.
(3) Total ballast water information. This includes the total ballast water capacity, total volume of ballast water onboard, total number of ballast water tanks, and total number of ballast water tanks in ballast. Use units of measurements such as metric tons (MT), cubic meters (m3), long tons (LT), and short tons (ST).
(4) Ballast water management (BWM). This includes the total number of ballast tanks/holds that are to be discharged into the waters of the United States or to a reception facility.
(i) If the vessel uses an alternative BWM method, note the number of tanks that are managed using an alternative method, as well as the type of method used.
(ii) Indicate whether the vessel has a BWM plan and IMO ballast water management guidelines onboard, and whether the BWM plan is used.
(5) Information on ballast water tanks that are to be discharged into the waters of the United States or to a reception facility. Include the following:
(i) The origin of ballast water. This includes date(s), location(s), volume(s) and temperature(s). If a tank has undergone ballast water exchange (BWE), list the loading port of the ballast water that was discharged during the exchange.
(ii) The date(s), location(s), volume(s), method, thoroughness (percentage exchanged, if BWE conducted), and sea height at time of exchange of any ballast water exchanged or otherwise managed.
(iii) The expected date, location, volume, and salinity of any ballast water to be discharged into the waters of the United States or to a reception facility.
(6) Discharge of sediment. Include the name and location of the facility where sediment disposal will take place, if sediment is to be discharged within the jurisdiction of the United States.
(7) Certification of accurate information. Include the master, owner, operator, agent, person in charge, or responsible officer's printed name, title, and signature attesting to the accuracy of the information provided and certifying compliance with the requirements of this subpart.
(b) The master, owner, operator, agent, or person in charge of a vessel subject to this section must retain a signed copy of this information onboard the vessel for 2 years.
(c) Two alternative ways to meet the requirements of this section are—
(1) Completing and retaining the Ballast Water Reporting Form contained in the IMO ballast water management guidelines; or
(2) Completing the ballast water information section of the form required by the St. Lawrence Seaway Pre-entry Information from Foreign Flagged Vessels.
(d) The master, owner, operator, agent, or person in charge of a vessel subject to this section must retain the monitoring records required in 46 CFR 162.060-20(b) for 2 years. These records may be stored on digital media but must be viewable for Coast Guard inspection.
(e) The information required by this subpart may be used to satisfy the ballast water recordkeeping requirements for vessels subject to § 151.2025(c) of this subpart and 33 CFR part 151 subpart C.

Seasonal Item: 1.2.e

Text: Waste Water tanks levels / soundings recorded / tracked (mark all that are recorded):

i. Graywater
ii. Sewage (blackwater or mixed)
iii. Permeate (treated wastewater)
iv. Segregated GW BW
v. Other tanks (WW)
vi. Bio Sludge
vii. Bio solids
viii. Pool, spa, and Jacuzzi
ix. Pulper water
x. Pulper convey water
xi. Pulper dewater
xii. Boiler/Economizer blowdown and washdown
xiii. Ballast water (33CFR151.2070)
xiv. Other tanks that could become wastewater

What to enter: Record if the levels are recorded, and which log or records are used.

Seasonal Item: 1.2.f

Text: Records on ballast transfers (33 CFR 151.2060)

What to enter: Are internal transfers or changes recorded? Where are they recorded? Recordkeeping for offloading to shore of ballast water?

Subsection 3: Material Conditions and Operations

Seasonal Item: 1.3.a

Text: MSD unit(s). List with manufacturer name, model number, capacity, number of units.

Background: Marine sanitation devices should have a placard or certification with capacities and other information. Some ships may have replaced MSDs with AWTS, and some may still have MSDs installed.

What to enter: List all MSD and wastewater treatment devices installed with name, model number, year built (if available), number of units, and maximum capacity.

Seasonal Item: 1.3.b

Text: Are there interfaces between the ballast and WW system?

There is always a potential for wastewater to enter the ballast water system if equipment or tanks are shared.

What to enter: Yes or No. If permitted ship list connections (this may be in the VSSP). If there are connections complete item 1.4.b.

Seasonal Item: 1.3.c

Text: Ballast Management Plans/ procedures onboard (Y/N)?

What to enter: Are there plans and procedures? If there are, what are they called?

Seasonal Item: 1.3.d

Text: Procedures for changing wastewater tanks to ballast water tanks (if applicable). What is done to prevent contamination of treated WW? Please list major procedures such as if pipes are drained or tanks cleaned.

Background: This information could be in the VSSP. Some ships use the same tanks and piping to collect or distribute wastewater and ballast water. There is always a potential for wastewater to enter the ballast water system if shared equipment or tanks. Cruise ships have procedures to prevent the introduction of wastewater into ballast water discharges. Any offloading to shore of ballast water?
What to enter: Enter N/A if ship is non permitted, non-discharging. List procedures that would prevent wastewater from entering the ballast water system or effluent. What is done to prevent contamination of ballast water or treated WW?

Section 2: Permitted ships and ships with current VSSPs

►**Tip:** *Permit documentation, Permits, VSSP's and other documentation is often kept in "centralized" place on board. Often are these locations already observed / visited during the regular Daily Check or check with the Environmental Officer (EO) or OR contact person for the most efficient ways to check.*

Seasonal Item: 2.1.a

Text: General Permit Authorization letter on board (GP)? (Y/N or NA)

Background: ADEC issues an authorization letter to discharge under the General Permit. An example is found in the wastewater section of the guidebook. This letter contains the vessel specific terms of discharge under the GP, such as what treatment system is used.
What to check for: Permitted vessels are required to carry GP authorization letter.

Seasonal Item: 2.1.b

Text: State of Alaska General Permit copy on board (GP)? (Y/N or NA)

What to check for: Permitted vessels need to carry a copy of the General Permit as a reference.

Seasonal Item: 2.1.c

Text: Copy of approved VSSP carried onboard and readily available (GP)? (Y/N or N/A)

Background: See the wastewater section of the guidebook for a description of the VSSP (1.3.a).

What to check for: Check that the VSSP is onboard and available.

Seasonal Item: 2.1.d

Text: Latest CLIA NW and Canada Quality Assurance Project Plan carried onboard IAW 18 AAC 69.025? (Y/N or N/A)
Background: The Quality Assurance Project Plan (QAPP) is a plan that documents sampling techniques and quality control and is approved by ADEC and the US Coast Guard. In order for the vessel and sampler to determine if the requirements of the QAPP are met, they need to have a copy onboard. See wastewater section under item 1.3.b for additional details.

What to check for: The most recent approved QAPP must be onboard and available if sampling.
Citation: 18 AAC 69.025 (f)

> (f) The owner or operator shall maintain a copy of the valid, approved plan of sampling techniques and analytical testing methods on board each vessel that the owner or operator causes or allows to be operated in the marine waters of the state.

Seasonal Item: 1.e Wastewater recordkeeping (for dischargers)

►Tip: AWTS maintenance / documentation is often found in the Technical Department. The Daily observations may already include the observed maintenance. Often on most vessels the Engineers can provide the records.

►Tip: Are AWTS system chemicals needed to have the AWTS system functioning properly?

Seasonal Item: 2.1.e.i

Text: AWTS Operations

What to check for: Are AWTS operations logged? If they are, explain where. This item will be useful for other Ocean Rangers checking on the operability of the AWTS.

Seasonal Item: 2.1.e.ii

Text: AWTS maintenance and repairs recorded

What to check for: Are AWTS maintenance and repairs logged? If they are, explain where. This item will be useful for other Ocean Rangers checking on the operability of the AWTS.

Seasonal Item: 2.1.e.iii

Text: AWTS system chemicals (process) record

What to enter: Enter if there is a log that records what or when process chemicals were added to the AWTS. If not, mark either "none used" or "not recorded"., But it is useful for determining if an AWTS is functioning according to manufactures specifications.

Seasonal Item: 2.1.e.iv

Text: GW BW maintenance / chemical treatment records (e.g. de-scaling etc.)

What to enter: Where this is logged. But useful information on the functioning of the AWTS and/or MSD.

Subsection 2: Equipment and Operations

►Tip: AWTS systems may have the MSD / AWTS IMO Certificate. The data on this certificate should be same as on the AWTS name plate. Note the certificate has an expiration date.

►Tip: The NOI discharge data (Port location diameter etc.) should be same on the approved VSSP document / AWTS capacities. Compare documentation for accuracy.

Seasonal Item: 2.2.a

Text: AWTS Units (if installed). List with manufacturer name, model number, capacity, number of units.

Background: See guidebook AWTS section for information on units. For future permit development ADEC needs information regarding capacity of ships that could be permitted in the future, even if they are not discharging at this time.

What to enter: List all AWTS devices installed with name, model number, year built (if available), number of units, and maximum capacity (with the units used). If devices are the same as listed as MSDs, enter same as above. If no AWTS enter N/A.

Seasonal Item: 2.2.b

Text: Does wastewater treatment equipment and capacities match the information provided in the ADEC GP Notice of Intent?

Background: This information should be available after completing question 2.2.a above and reviewing the VSSP for accuracy. A copy of the NOI will be in the DEC Ocean Ranger electronic files. The NOI is the basis for awarding an authorization for discharge in Alaska, and contains information necessary for permit development.

What to enter: If permitted ship enter Yes if information in the NOI is correct. If information is not correct enter No and submit an Incident or General Report with information on what is not correct.

Seasonal Item: 2.2.c

Text: Hydraulic capacity of MSD system (BW / GW) is of sufficient capacity (VSSP / GP).

What to enter: Check the calculation of total flow against the capacity information given in the VSSP or Notice of Intent. Check that flow does not exceed capacity. If capacity is sufficient mark yes.

Background: Flow that exceeds capacity of a treatment system could lead to overflow into the bilge, system damage, or a system not being able to meet the effluent quality it was designed to meet. ADEC has seen cases in the past of wastewater dumped into bilges or overboard because an MSD was not of sufficient capacity.

Of particular concern here are split systems, either with inflow or outflow split. This may be more difficult to check than a simple single system.

Seasonal Item: 2.2.d

Text: Are flow discharge meters installed?

What to enter: Record if flow meters are installed. (Y/N)

Seasonal Item: 2.2.e

Text: If flow meters are installed are they used and operable condition?

What to enter: The GP has requirements for reporting. Record if they are used and if they are functional.

Seasonal Item: 2.2.f

Text: Explain process for estimating or metering WW discharged (both treated and untreated).

What to enter: The GP has requirements for reporting. Please note the process used to record volumes and times in the discharge record book (logs). Please note the process used for estimating or metering, and the time that the metering / estimation is performed and recorded.

Subsection 3: Vessel Specific Sampling Plans (VSSP)

►Tip: Inaccuracies have been found in the VSSP documentation. More specifically they were: 1) Magic Tanks (Ballast water tanks used for WW storage but not identified 2) Name conventions of the sample valve / tanks 3) wrong location included in the VSSP of the discharge Port.

Note: This section is only to be completed if the vessel has an approved Vessel Specific Sampling Plan (VSSP) for this year. For unpermitted vessels with a VSSP do not check items with a "GP" as a citation such as authorization letter. (18 AAC 69.030 and 33 CFR 159.37 (c))

VSSP and OWS checks are more detailed than those listed in the job aid for these subjects. They shall be done again if there are major changes to systems during the cruise season, or if there are compliance checks requested by ADEC that relate to use of the equipment. Background information can be found in the Job Aid sections of the guidebook.

Detailed Piping and Compliance Checks. These items are more "in the details" look at plans, such as pipe arrangements, tracing of valves flanges / blind flanges, and checks of equipment used. This may include looking at pipe tank connections and other systems inter tied with the piping system. Correlations are made on how systems are interwoven. An example is wastewater storage in double bottom tanks. How is this done? How these systems are interfaced (pipe lay out system) with the ballast water system?

Although the piping system on board of large cruise vessels are relatively straight forward, the possible integration of the piping systems with other systems can make this job more demanding.

Check all items that apply. List any deviations noted and report deviations in the VSSP on your daily report as well (under 1.3.a). Note this section only applies to ships that are sampling for ADEC or USCG and have an approved VSSP.

a. Check and confirm sample valve related piping & sample valve location is as documented in VSSP.
b. Check that WW sources match VSSP description and volumes
c. Treatment systems and processes listed in VSSP match those onboard.
d. Check VSSP capacities against treatment system posted or documented values.
e. Check that discharge ports (names and locations and type of effluent) match VSSP and wastewater logs.
f. Check discharge port diameter.
g. VSSP estimates of production are reasonable estimates and match production amounts
h. Tank lists in VSSP match locations, names, capacities, and what is stored
i. Discharge pumps and flow rates match VSSP
j. Procedures for discharges match those provided in VSSP.
k. Do the standards for determining deviations listed in the VSSP match what are used onboard?
l. GW and BW system connections to the Ballast Water system (tanks piping manifolds) and common connections IAW VSSP

Seasonal Item: 2.3.l

Text: GW and BW system connections to the ballast water system (tanks piping manifolds) and common connections IAW VSSP/GP

What to check for: Check connections between ballast water and wastewater systems. Check that tanks used are included in the VSSP. Check that procedures are in place to prevent discharge of wastewater through the ballast water system or from holding tanks without a specific sampling program. Check that the vessel has ways to clean or flush out tanks and pipes that have been used for wastewater prior to use for ballast water.

Background: Many vessels use ballast water tanks at times to hold wastewater. This is acceptable under the general permit and current regulations. By using ballast water tanks there is the potential for discharge of wastewater through the ballast water system. If wastewater was discharged from ballast holding tanks or pipes it would need to be treated, and it would have to be part of a sampling regime (sampling held wastewater).

Some vessels pipe systems to and from WW holding tanks are complex and not easy to understand. OR needs to check this by visually tracking the major piping parts of the system. Ballast water tanks used for WW or waste solids need to be cleaned when used for ballast water operations in Alaska. A helpful check is on the operations and how treated stored WW and other WW is handled and discharged.

Citations: 18 AAC 69.030

(b) A vessel specific sampling plan must include

(4) the capacity and location of each holding tank for treated sewage;
(5) the capacity and location of each holding tank for graywater;
(6) the capacity and location of each holding tank for combined treated sewage and graywater;

Subsection 4: Notice of Intent Checks (NOI)

►Tip: Vessel particulars are obtainable form the engineering department. Often handouts with the vessel specifics are available. Please check specific items listed against the Notice of Intent. ADEC will provide you with a copy of the NOI. Some items cannot be easily checked, such as length of ship. The questions will be related to items that can be verified.

Section 3: Hazardous materials and solid waste

For background please refer to the waste sections of the guidebook. Note- for full citations see the waste sections of the guidebook.

Citation: 33 CFR 151.55: Recordkeeping requirements.

(a) This section applies to the following:

(1) Every manned oceangoing ship (other than a fixed or floating platform) of 400 gross tons and above that is engaged in commerce and that is documented under the laws of the United States or numbered by a State.
(2) Every manned fixed or floating platform subject to the jurisdiction of the United States.
(3) Every manned ship that is certified to carry 15 passengers or more engaged in international voyages.

(b) The master or person in charge of each ship under paragraph (a)(1), (a)(2), or (a)(3) of this section shall ensure that a written record is maintained on the ship of each of the following garbage discharge or disposal operations:

(1) Discharge overboard.
(2) Discharge to another ship.
(3) Discharge to a reception facility.
(4) Incineration on the ship.

(c) The record under paragraph (b) of this section must contain the following information on each discharge or disposal operation:

(1) The type of operation as described under paragraphs (b)(1) through (b)(4) of this section.
(2) The date and time of the operation.
(3) If the operation was conducted at a port, the name of the port.
(4) If the operation was not conducted at a port, the latitude and longitude of the location where the operation was conducted and the estimated distance of that location from shore. If the operation involved off-loading to another ship, the identity of the receiving ship by name and official number.
(5) The amount of garbage involved, described by volume in cubic meters.
(6) For discharges into the sea, a description of the contents of the garbage, described by the following categories:

(i) Plastic material.
(ii) Floating dunnage, lining, or packing material.
(iii) Ground paper products, rags, glass, metal, bottles, crockery, or other similar garbage.
(iv) Unground paper products, rags, glass, metal, bottles, crockery, or other similar garbage.
(v) Victual wastes.
(vi) Incinerated ash.
(vii) Incinerated plastic residue.

(d) The record under paragraph (b) of this section must be prepared at the time of the operation, certified as correct by the master or person in charge of the ship, maintained on the ship for two years following the operation, and made available for inspection by the Coast Guard.

Subsection 1: Information

Seasonal Item: 3.1.a

Text: Title of Responsible Person on board (33 CFR 151.55(d) for reporting) (33 CFR 151.63 for responsible party):

What to enter: Title (not name) of the person responsible for waste handling.
Citation: 33 CFR 151.63 (a) a) The master, operator, or person who is in charge of a ship shall ensure that all garbage is discharged ashore or in accordance with §§ 151.66-151.73.

Subsection 2: Documentation

Seasonal Item: 3.2.a

Text: Certification of TBT free paint coating on hull (AS 46.03.715)? (Y/N)

Background: TBT paint use and sale was banned in Alaska under state law based on concern regarding the toxicity and long term effects of the antifouling paints being used.

What to check for: Most ships will have a TBT certificate available.
Citation: AS. 46.03.715(d). Sale and use of TBT-based antifouling paint.

This is to certify that

" "

IMO

was coated with

Intersleek 970 (FXA972 Blue), a Foul Release coating system,

and with

Interspeed 640 (BRA 641 Blue, BRA640 Red)
a TBT-free Controlled Depletion Polymer Antifouling coating,

in compliance with the IMO Antifouling Systems Convention of 2001 (AFS/CONF/2
during the drydocking at San Francisco, CA
in March 2009.

Intersleek 970 is manufactured by
International Paint LLC and do not contain any active ingredients.

Interspeed 640 is manufactured by
International Paint LLC and contains the following active ingredients:
Cuprous Oxide (CAS# 1317-39-1)

Figure 1: TBT Example Certificate

(d) If a vessel of the United States government, a foreign vessel in state water fewer than 90 consecutive days, or a vessel of 4,000 gross tons or more was painted

or treated with a TBT-based marine antifouling paint or coating before January 1, 2001, the paint or coating need not be removed, but the vessel may not be repainted or retreated with a TBT-based marine antifouling paint or coating.

(e) In this section

(1) "slow-leaching TBT-based marine antifouling paint" means a TBT-based marine antifouling paint, but not a coating or other treatment, that has a measured release rate equal to or less than the maximum release rate established for qualified antifouling paints containing organotin by the U.S. Environmental Protection Agency under 33 U.S.C. 2401 - 2410 (the Organotin Antifouling Paint Control Act of 1988);

(2) "TBT-based marine antifouling paint or coating" means a paint, coating, or treatment that contains tributyltin, or a triorganotin compound used as a substitute for tributyltin, and that is intended to control fouling organisms in a fresh water or marine environment;

(3) "vessel" means watercraft used or capable of being used as a means of transportation on water, including

(A) aircraft equipped to land on water; and (B) barges.

Seasonal Item: 3.2.b

Text: Waste / Hazardous wastes offloading plan(s) carried onboard (18 AAC 69.035 / 69.040)? (Y/N)

Background: See waste sections. This is a check if they are onboard. The daily report includes check if they are being followed. A vessel can deviate from a waste plan, but need to submit a deviation report in November documenting changes. Citation: See Waste sections of the guidebook.

What to check for: Check that the waste plans are available onboard.

Seasonal Item: 3.2.c

Text: Vessel garbage management plan IAW 18AAC 69.035 / 33 CFR 151.55(b)(d)

Background: Cruise ships must submit waste offload plans to ADEC. See guidebook waste sections for more details.

What to enter: Check if the garbage management plan conflicts at all with the submitted Alaska waste offload plan. Enter satisfactory (SAT) if there are no conflicts.

Seasonal Item: 3.2.d

Text: The controlled storage processing or disposal facilities or treatment used is IAW (18 AAC 69.040)

Background: Cruise ships are required (if offloading hazardous waste in Alaska) to document planned methods, training, and facilities used in their hazardous waste offload plans. Most ships do not offload hazardous waste in Alaska.

What to check for: If the ship offloads hazardous waste in Alaska, check that offloads match those in the current hazardous waste offload plan. Check also the packaging of the offloaded materials.

Seasonal Item: 3.2.e

Text: Crew training in off loading procedures is IAW 18 AAC 69.040.

What to check for: If the ship offloads hazardous waste in Alaska, check crew training matches the current hazardous waste offload plan. Citation- 18 AAC 69.040.

Seasonal Item: 3.2.f

Text: Manufacturer provided material safety data sheet (MSDS) (if applicable) are included on the Hazardous waste and hazardous substances offloading plan IAW 18 AAC 69.040

Background: Material safety data sheets or products safety datasheets should be supplied with all potentially hazardous or toxic chemicals. These sheets are intended to inform the end user of hazards, physical data, and how to safely handle and use the product. They should also identify the use and need of personal protection gear.

Figure 2: MSDS Sheet in prominent position

What to check for: If hazardous waste is offloaded in Alaska, the MSDS is applicable must be in either the offload plan or will be submitted in the end of season deviation report.

Seasonal Item: 3.2.g

Text: Reports of alleged inadequacy of port reception facilities for garbage on file for both hazardous and non-hazardous waste (if applicable)? (33 CFR 158.400)

What to check for: Has Vessel reported any inadequate port reception facilities in Alaska?

Seasonal Item: 3.2.h Recordkeeping

Seasonal Item: 3.2.h.i

Text: Garbage logs, hazardous materials offloads recorded / tracked ?

What to enter: What are the names of the logs or records? How are offloads recorded?

Seasonal Item: 3.2.h.ii

Text: Overboard waste chute use recorded

Background: Waste chutes onboard cruise ships in Alaska are generally sealed or locked.
What to enter: If waste chutes are used, how are entries recorded. How are discharges tracked?

Seasonal Item: 3.2.h.iii

Text: Recording of incinerator ash disposal

Background: Incinerator ash could contain plastics, metals, or other non-combustibles such as glass. Incinerator ash needs to be properly disposed of.
What to enter: How are records kept of incinerator ash disposal? Where is this recorded?

Seasonal Item: 3.2.h.iv

Text: Medical waste offload records
Background: Medical wastes are often treated as hazardous materials.
What to enter: How are records kept? Where is this recorded?

Seasonal Item: 3.2.h.v

Text: Photo waste and hospital x-ray waste
Background: Photo wastes and chemicals can contain silver and toxic materials. Hospital wastes can contain x-ray developing materials. Not all ships may have these waste streams.
What to enter: How are records kept? Where is this recorded?

Seasonal Item: 3.2.h.vi

Text: Oily rags & filters records

Background: Oily rags and filters can be offloaded or incinerated.

What to enter: How are records kept? Where is this recorded?

Seasonal Item: 3.2.h.vii

Text: Other wastes records

Background: Biosolids and sewage sludge cannot be discharged in Alaska waters.

What to enter: Where are these materials stored? How are records kept? Where is this recorded?

Subsection 3: Material Conditions and Equipment

Seasonal Item: 3.3.b

Text: Describe the controlled storage & processing or disposal facilities or treatment used. (18 AAC 69.040(5)):

What to check for: Describe the waste storage and handling process onboard.

Seasonal Item: 3.3.b

Text: Grinders IAW 33 CFR 151.75

Background: This item is to check for the potential to discharge large items when the requirements are for small pieces. This should reduce the chance of items like food waste floating back to shore. Check if this item applies on the vessel, many do not discharge these items between 3 and 12 nm, but wait until outside 12nm.

This item may be hard to check unless equipment is open for cleaning or maintenance.

What to check for: For ships that discharge food wastes, ground glass, or other materials inside of 12nm check that screen openings are less than 1 inch.

Citation: 33 CFR 151.75 Grinders or comminuters.

Each grinder or comminuter used to discharge garbage in accordance with §151.69(a)(2) or §151.73(b)(1), must be capable of processing garbage so that it passes through a screen with openings no greater than 25 millimeters (one inch).

Seasonal Item: 3.3.c

Text: Valves and flappers on chutes IAW AS 46.03.710

Background: Most cruise ships have discharge chutes or "tunnels". These chutes are often close to the solid waste processing area. Some ships have multiple chutes. The chutes can have valves or flappers. Most ships have procedures for locking valves or chutes. Some ships have welded these shut to avoid use.

What to check for: Check that valves or flappers on waste chutes are closed in Alaska waters. Check waste records for any documentation of use in Alaska waters.

Citation: AS 46.03.710. Pollution prohibited.

A person may not pollute or add to the pollution of the air, land, subsurface land, or water of the state.

Subsection 4: Operations and Procedures

Seasonal Item: 3.4.a

Text: Vessel machinery logs, reports for maintenance, repairs, cleaning operations of the hazardous mat handling equipment are onboard and available (33 CFR 151.63 (b(3)).

Background: One of the factors when evaluating compliance with waste handling requirements is if the equipment is operable. One sign of operable equipment is regular maintenance and recording of operations.

What to enter: If compliant then enter SAT.

Citation: 151.63 Shipboard control of garbage.

(a) The master, operator, or person who is in charge of a ship shall ensure that all garbage is discharged ashore or in accordance with §§ 151.66-151.73.

(b) The following factors, among others, may be considered by enforcement personnel in evaluating compliance with §§ 151.51 through 151.77:

(1) Records, including receipts, of garbage discharges at port reception facilities.

(2) Records under § 151.55 or log entries of garbage discharges.

(3) The presence and operability of equipment to treat ship-generated garbage, including, but not limited to, incinerators, grinders, or comminuters.

(4) The presence of and adherence to a written shipboard waste management plan.

(5) The absence of plastics in ship stores.

(6) Ongoing educational programs to train shipboard personnel of garbage handling procedures and the need for these.

(7) The presence of shipboard spaces used for collecting, processing, storing and discharging ship-generated garbage.

(c) The master, operator, or person who is in charge of a ship shall ensure that if garbage is transported from a ship by shipboard personnel, it is properly deposited into a port or terminal's reception facility.

Seasonal Item: 3.4.b

Text: Garbage Pollution Placards posted IAW 33CFR151.59

Background: Pollution placards are used to help educate crew and passengers in what can and cannot be discharged and where discharges are allowed of solid wastes.

What to enter: Enter Satisfactory (SAT) if they are present, are accessible, and prominent.

Citations: 33 CF 151.59(b)

The master or person in charge of each ship under paragraph (a)(1) or (a)(2) of this section shall ensure that one or more placards meeting the requirements of this section are displayed in prominent locations and in sufficient numbers so that they can be read by the crew and passengers. These locations must be readily accessible to the intended reader and may include embarkation points, food service facilities, garbage handling spaces, and common spaces on deck. If the Captain of the Port determines that the number or location of the placards is insufficient to adequately inform crew and passengers, the Captain of the Port may require additional placards and may specify their locations. R 151.59 (b)

Seasonal Item: 3.4.c

Text: Checked Human Factors (crew familiar with procedures, sanitation maintained, protective equipment available if needed, warning signs posted) (33CFR151.63(b))

Background: This is another check for signs that garbage is not handled correctly. Most ships try to use clear procedures, such as color coding of wastes. In general waste sorters are dedicated crew and should be aware of the waste handling processes.

What to check for: Check that the waste management plan(s) are available, and that crew are familiar with these plans. Familiarity could include training programs, such as how to identify plastic waste.

Citations: 33 CFR 151.63 Shipboard control of garbage.

(b) The following factors, among others, may be considered by enforcement personnel in evaluating compliance with §§151.51 through 151.77:

(1) Records, including receipts, of garbage discharges at port reception facilities.

(2) Records under §151.55 or log entries of garbage discharges.

(3) The presence and operability of equipment to treat ship-generated garbage, including, but not limited to, incinerators, grinders, or comminuters.

(4) The presence of and adherence to a written shipboard waste management plan.

(5) The absence of plastics in ship stores.

(6) Ongoing educational programs to train shipboard personnel of garbage handling procedures and the need for these.

(7) The presence of shipboard spaces used for collecting, processing, storing and discharging ship-generated garbage.

Seasonal Item: 3.4.d

Text: Human Factors. Master and crew were familiar with essential shipboard Hazardous Material handling procedures. Personal protective equipment available, functioning and in place (ILO 134). Sanitation, from a health standpoint, being maintained (ILO 147). 33 CFR 151.63 (b)

Background: In addition to having plans and procedures for handling waste, cruise ship crews that handle waste must be familiar with those plans and with the safety measures contained in those plans.

What to check for: Check that crew understand procedures, and know where they are and who to contact if they have questions. Check for presence of safety equipment like eye protection, gloves, eyewash stations, etc.

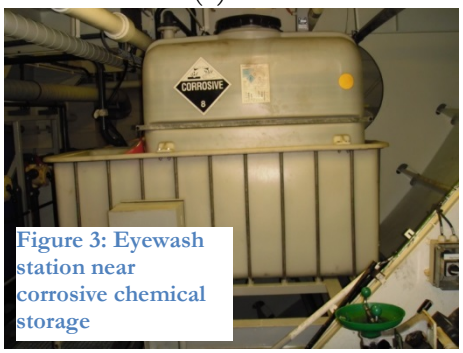


Figure 3: Eyewash station near corrosive chemical storage

Seasonal Item: 3.4.e

Text: Procedures to minimize amount of potential waste IAW (40 CFR 262.27)?

Background: Generators of hazardous waste must certify they either a small generator and will minimize waste generation, or they are a large generator who will have a program in place to reduce the volume. This will commonly be seen as efforts to stop the introduction of hazardous materials or wastes into the garbage waste stream by proper handling and storage. Segregation of wastes will minimize volumes, because mixed waste would need to be handled as hazardous.

What to enter: Enter SAT if the vessel has procedures to minimize hazardous wastes, to segregate hazardous wastes, or has implemented measures to replace hazardous substances with less toxic materials.

Seasonal Item: 3.4.f

Text: Waste is sorted to prevent hazardous materials or wastes entering garbage waste stream. Separate defined storage areas for hazardous materials or wastes/ non hazardous materials – no commingled waste IAW 40 CFR 265.17

Background: Cruise ships generally have effective ways to sort waste streams to separate recycling and any potential hazardous wastes from general garbage.

What to check for: Check that waste is sorted and hazardous waste is kept separate to avoid accidental re-introduction to the garbage or recycling materials.

Figure 4: Separated Waste

Figure 5: Stored Waste

Citation: 40 CFR 265.17 General requirements for ignitable, reactive, or incompatible wastes.

(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to: Open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to specially designated locations. ''No Smoking'' signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

(b) Where specifically required by other sections of this part, the treatment, storage, or disposal of ignitable or reactive waste, and the mixture or commingling of incompatible wastes, or incompatible wastes and materials, must be conducted so that it does not:

(1) Generate extreme heat or pressure, fire or explosion, or violent reaction;

(2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;

(3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

Seasonal Item: 3.4.f

Text: Describe the crew training in off loading process / procedures.

Background: Crew must be trained in proper procedures.

What to enter: Explain briefly the crew training in garbage offloading.

Section 4: Oil and Fuel

Note: General background and most citations are found in the oil section of the guidebook.

Subsection 1: Information

Text: Title of Designated Person in Charge (PIC) (33 CFR 155.700):

What to enter: Title (not name) of the person responsible for oil and fuel.

Subsection2: Documentation

Seasonal Item: 4.2.a

i.	Oil water separator discharges
ii.	Oily water separator repair & calibration
iii.	Bilge water/ oily water sludges transfers
iv.	Fuel / Lubrication Oils / sludges
v.	Fuel tanks Lubrication oil tank levels

vi.	Fuel bunker & consumption
vii.	Fuel sulfur content (40 CFR 1043)
viii.	Lubrication Oil bunker & consumption
ix.	Drumstore Oil storage & consumption
x.	Other oil wastes records
xi.	Propulsion system lubrication use (records of fill ups and changes)
xii.	Shaft seal to sea surfaces / tank levels
xiii.	Stabilizer systems
xiv.	Thruster systems tank levels
xv.	Hydraulic system oil use (fill ups or changes)
xvi.	Power rams
xvii.	Steering gear
xviii.	Deck equipment including lifeboat systems
xix.	Grease consumption
xx.	Oil spill reporting

What to enter: For each item answer if records are kept? Where is this recorded?

Subsection 3: Material Conditions

Seasonal Item: 4.3.a

Text: Oil pollution Placard is Posted (18 AAC 75.305)?

Background: State regulations require the posting of oil reporting information while in Alaska.

What to enter: SAT if placard is posted and conspicuous.

Citation: 18 AAC 75.305. Posting of information required. (a) The owner or operator shall display a discharge or release notification placard, provided by the department, that includes telephone numbers of department offices in conspicuous locations on a

(2) tugboat, tank vessel, oil barge, tow boat, or other vessel transporting a hazardous substance as cargo in state waters;

Seasonal Item: 4.3.b

Text: Standard discharge connection / bunker station IAW 33CFR155.370(c))

Background: Most cruise ships reduce the risk of oil spills by using international connections from ship to shore / bunker ship. Most cruise ships do not bunker in Alaska or on very rare occasions bunker on limited scale (emergency lub oils / hydraulic oils). However, it should be noted that in most cases the heavy fuel, distillated fuels and lube oils, hydraulic oils etc. are bunkered in non Alaskan Ports. On very rare occasions bunkering on limited scale could happen in Alaska. General background included in oil section, under OWS of the guidebook.

What to enter: Check bunkering stations for oil spills and leaks / procedures. Enter SAT if the vessel has a pipeline/way to discharge oil mixtures properly.

Citation: (c) No person may operate a ship under this section unless it is equipped with a pipeline to discharge oily mixtures to a reception facility.

Seasonal Item: 4.3.c

Text: Checked fuel / lube sludge fill vent and overflow discharge containment IAW (33 CFR 155.320).

Background: Tanks are equipped with vents and containment system / overflow to overflow tanks. Depending on the vessel, the overflows of the larger tanks are overflowing in a monitored (alarm equipped) fuel overflow tank. Some operators call this tank or tank system "fuel protection tank". There may be more than one of these fuel overflow tanks in the system. Smaller tanks, or tanks that are not connected to the "oil overflow tank system" may direct overflow for the tanks to a dedicated vent pipe. This is in particular the case of smaller tanks (e.g. lube oil tanks. Note: Some vessels have their engine crankcase breather systems terminating in the funnel / top deck area. The breather contain oily (lube oil) air mixture. Around these breather terminals there is a containment area. Check this areas for oil and if the oil (condensate) is removed.

What to enter: Enter SAT if tanks are vented and overflow discharge containment meets federal requirements.

Citation: 155.320 Fuel oil and bulk lubricating oil discharge containment.

(a) A ship of 300 gross tons or more constructed after June 30, 1974 must have a fixed container or enclosed deck area under or around each fuel oil or bulk lubricating oil tank vent, overflow, and fill pipe, that:(2) For a ship of 1600 or more gross tons has a capacity of one barrel.

Seasonal Item: 4.3.d

Text: Checked containment / drains / scupper closures IAW (33 CFR 155.320).

Background: If scuppers and drains are closed during oil transfer operations. This is more related to bunkering; vessels generally do not bunker in AK. However the bunker oil spill prevention plan includes these items. Oil containment- are the plugs inserted / drains open? If procedures are implemented that when oil transfers operations are conducted, drains and scupper closures are done (same as above). However, it should be noted that in most cases the heavy fuel, distillated fuels and lube oils, hydraulic oils etc. are bunkered in non Alaskan Ports. On very rare occasions bunkering on limited scale could happen in Alaska.

With regard with fuel transfer for example on the vessel itself with dispensers / hoses etc. which may used to "fuel up" the life boats and tenders, this rule applies. In such occasion include this item in your report.

What to enter: Check for compliance with 33 CFR 370- citation is in item above.

Subsection 4: Operations and Procedures

Seasonal Item: 4.4.a

Text: Oil transfer procedures are posted and available in crew's language? (18 AAC 75.025 / 33 CFR 154.300 a(3))

Background: Oil transfers from or to large cruise ships in Alaska is not common. Fueling of tenders is covered in the daily report Job Aid.

What to enter: SAT if yes or N/A.

Citation: 18 AAC 75.025. Transfer requirements.

(a) The owner or operator of an oil terminal facility, railroad, tank vessel, or oil barge shall take all appropriate measures to prevent spills or overfilling during a transfer of oil, including reduced loading rates at the beginning and end of a transfer.

(d) The owner or operator shall ensure that each person involved in a transfer is capable of clearly communicating orders to stop a transfer at any time during the transfer.

33 CFR 154.300 a(3): Includes translations into a language or languages understood by all designated persons in charge of transfer operations employed by the facility.

Seasonal Item: 4.4.b

Text: Number of persons required on duty is as identified in the operations manual? (33 CFR 154.310 a(6))

Background: See 3.3.c. Citation: a(6) The minimum number of persons on duty during transfer operations and their duties;

What to enter: SAT if yes or N/A.

Seasonal Item: 4.4.c

Text: Means of communication identified in operations manual (33 CFR 154.310 a(9))

Background: See 3.3.c. Citation: a (9) A description of each communication system required by this part.

What to enter: SAT or UNSAT.

Seasonal Item: 4.4.d

Text: Procedures on oil spills listed in operations manual (33 CFR 154.310a(5(f))

Background: The procedures to be followed if the cargo spills or leaks, or if a person is exposed to the cargo should be in the operations manual.

What to enter: SAT or UNSAT

Subsection 5: Oily Water Separator (OWS) :Oil Water Separation/Oil systems (33 CFR 155.360-380)

Check all items that apply. List any deviations noted and report these on your daily report as well (under 7.2). Insert an X or check mark on the report for each item checked.

1: Documentation and Administrative

a. Bilge system piping matches approved diagram (direct to OWS, holding tank etc.)
b. Check if strip charts are fitted.
c. General housekeeping and cleanliness, maintenance looks acceptable
d. OWS system if in operation, evaluate operator competency.
e. System operating in published ranges.

2: Mechanical- Is the OWS free from:

a. Electrical bypasses, jumpers, extra switches on the OWS unit or meter control panel.
b. Blanked flanges, pipe caps, dead-ended valves, or tees on inlet or outlet piping.
c. Unusual connections to other machinery space overboard piping
e. Recent paint on pipe segments
f. Indications of bolting / unbolting of associated, piping segments valves.

3: Ensure:

a. Observe has automatic recirculate (3 way valve) or shuts down when > 15 ppm
b. In use valves operate properly
c. Samples analyzed by OWS meter is from the OWS effluent (trace sample-line to ensure no clean-water connection)

Section 5: Air Pollution and Opacity (18 AAC 50.40 CFR 1043)

Note: General background and most citations are found in the air section of the guidebook. Self-reporting of known violations is required under 18 AAC 50.240.

Subsection 1: Information

Seasonal Item: 5.1.a

Text: Title of primary contact on board

What to enter: Title (not name) of the person responsible for air emissions.

Seasonal Item: 5.1.b

Text: Is emission monitoring equipment installed and used onboard? (Y/N)
Background: Most cruise ships monitor emissions. This information is helpful when evaluating self-reports.
What to enter: If Y then list how and the name of the records.

Seasonal Item: 5.1.c

Text: Emission monitoring equipment functioning properly? (Y/N/NA)
What to enter: Y if equipment is functioning.NA if equipment is not installed onboard.

Seasonal Item: 5.1.d

Text: Exhaust Gas Scrubber Installed Onboard? (Y/N)
What to enter: Y if equipment is installed.

Seasonal Item: 5.1.e

Text: Opacity monitoring records kept onboard? (Y/N).
Background: Many cruise ships monitor opacity for self-monitoring and self-reporting of opacity execedances. When ADEC evaluates these self-reports it is useful to know how the vessel keeps records.
What to enter: If Y then list how and the name of the records.

Seasonal Item: 5.1.f

Text: Self reporting records kept onboard? (Y/N).
Background: Many cruise ships monitor opacity for self-monitoring and self-reporting of opacity execedances. When ADEC evaluates these self-reports it is useful to know how the vessel keeps records.
What to enter: If Y then list how and the name of the records.

Seasonal Item: 5.1.g

Text: List the self reporting procedures in place? (opacity)(18 AAC 50.240)
What to enter: Briefly explain those procedures.

Seasonal Item: 5.1.h

Text: Does the vessel have an approved alternative equivalent method for complying with fuel requirements in 40 CFR 1043 (40 CFR 1043.55)?

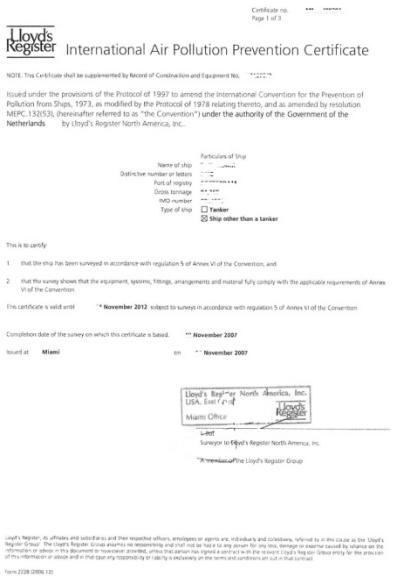
Background: In 2015, many ships had been granted exemptions from the EPA. Vessels should have documentation onboard regarding the exemption. The EPA and USCG may be looking more closely at this this year, so it is critical to monitor these and document which ships have exemptions. Some vessels may have scrubber installations as part of the exemption. See Opacity section for citation.
What to Check for: Check for documentation or information regarding approved equivalent method.

Citation: 40 CFR 1043.55 Applying equivalent controls instead of complying with fuel requirements.
Regulation 4 of Annex VI allows Administrations to approve the use of fuels not meeting the requirements of Regulation 14 of the Annex, provided the vessel applies a method that results in equivalent emission reductions. This section describes provisions related to applying this allowance.
(a) Any person may request approval of such equivalent methods for controlling emissions on U.S.-flagged vessels by submitting an application for certification of an equivalent control method to the Designated Certification Officer. If we determine that your control method achieves emission levels equivalent to those achieved by the use of fuels meeting the requirements of Regulation 14 of Annex VI, we will issue a certificate and notify IMO that your method has been certified.
(b) The provisions of this paragraph (b) apply for vessels equipped with controls certified by the Administration of a foreign flag vessel to achieve emission levels equivalent to those achieved by the use of fuels meeting the applicable fuel sulfur limits of Regulation 14 of Annex VI. Fuels not meeting the applicable fuel sulfur limits of Regulation 14 of Annex VI may be used on such vessels consistent with the provisions of the IAPP certificate, APPS and Annex VI.
(c) Compliance with the requirements of this section does not affect the applicability of requirements or prohibitions specified by other statutes or regulations with respect to water pollution.
Background: See the air section of the guidebook for information from the EPA on the North America ECA and for the regulations on this item. Operators can apply for an exemption based on equivalent controls. This could include scrubbers or other methods to reduce sulfur emissions.
What to enter: Do they have a documented and approved exemption to the fuel requirements?

Subsection 2: Documentation

Seasonal Item: 5.2.a

40 CFR 1043.60
Text: NOx Emissions certification (IMO Annex VI) (Y/N)
Background: NOx is oxides of nitrogen, which is of concern due to the health effects. IMO Annex VI regulation 13 addresses tiered control requirements for NOx that apply to marine diesel engines over 130 kW other than emergency only engines or generators.
What to check for: Check that certification is present and covers all sources.


Certificate no. ***
Page 1 of 3

Lloyd's Register International Air Pollution Prevention Certificate

NOTE: This Certificate shall be supplemented by Record of Construction and Equipment No. ***

Issued under the provisions of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and as amended by resolution MEPC.132(53), (hereinafter referred to as "the Convention") under the authority of the Government of the Netherlands by Lloyd's Register North America, Inc.

Particulars of Ship
Name of ship
Distinctive number or letters
Port of registry
Gross tonnage
IMO number
Type of ship ☐ Tanker ☒ Ship other than a tanker

This is to certify:

1. that the ship has been surveyed in accordance with regulation 5 of Annex VI of the Convention, and
2. that the survey shows that the equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of Annex VI of the Convention

This certificate is valid until * November 2012 subject to surveys in accordance with regulation 5 of Annex VI of the Convention

Completion date of the survey on which this certificate is based. ** November 2007

Issued at Miami on *** November 2007

Lloyd's Register North America, Inc.
USA, East Gulf
Miami Office
Lloyd's Register

Surveyor to Lloyd's Register North America, Inc.

*Delete as appropriate **The Lloyd's Register Group

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Form 2228 (2006.12)

Text: Does the vessels have a valid International Air Pollution Prevention (IAPP) or Engine International Air Pollution Prevention (EIAPP) certificate (>130kW)? (Y/N)

Background: All foreign flagged vessels over 400 gross tons need to have IAPP certificate that meets the requirements of MARPOL Annex VI regulation 6.
What to check for: Check that the IAPP certificate is valid. Check the expiration date. Note- not needed for emergency only engines or for engines not installed after 2000 that have not been modified.

Seasonal Item: 5.2.c

Text: Freon / refrigerants use IAW MARPOL Annex VI Regulation 12 (6-7)

i. Records are kept and updated of refrigerant use? (Y/N)
ii. Check the entries and used consumed volumes of refrigerants

What to enter: How are records kept? Where is this recorded? Are volumes excessive?

Seasonal Item: 5.2.d

Text: Fuel use records IAW with 40 CFR 1043.70?

Background: See the air section of the guidebook for information from the EPA on the North America ECA and for the regulations on this item. Does the vessel monitor and record the total Sulfur content (% by weight) of each bunkered party of fuel used in Alaska Waters (including the MDO MGO IFO HFO fuel types)? (IMO Annex VI)(40 CFR 1043)Which record or logbook is used? Is low-sulfur used? Records IAW with 40 CFR 1043?

What to enter: How are records kept? Where is this recorded? Is low sulfur fuel used, or do they have a documented exemption? Are records IAW with 40 CFR 1043.

Subsection 3: Material Conditions and Equipment

Seasonal Item: 5.3.a

Text: If there are "high sulfur" fuels onboard, are they separated (physically) from the other fuels? (40 CFR 1043.60)
What to enter: If Y then list how they are separated physically

Subsection 4: Operations and Procedures (40 CFR 1043.60)

Please note 5.1.h if alternative methods are in place.

Seasonal Item: 5.4.a

Text: Describe the fuel switch a procedure (40 CFR 1043.60)
Background: See the air section of the guidebook for the full citation and background.
What to enter: Explain how fuel switches are accomplished if they are done. Provide information if the vessel has an exemption from the NA ECA in 5.1.g.

Seasonal Item: 5.4.b

Text: How is it ensured that the low sulfur fuel is used in the areas where it is mandatory for use? (timely switch / fuel flushing)? (40 CFR 1043.60) What procedures are in place to switchover fuels?
What to enter: Explain process for ensuring low sulfur fuel is used where required.

Seasonal Item: 5.4.c

Text: Are there dedicated low sulfur combustion sources and high sulfur fuel switch sources?

Background: Are there are "high sulfur" fuels on board, how are they separated (physically) form the "low Sulfur" fuels. (40 CFR 1043)
What to enter: If Y then list how they are separated physically.

Seasonal Item: 5.4.d
Text: Adequate capacity for using required fuels or alternative method in Alaska waters?
What to enter: Does the vessel had a reasonable amount of fuel that will meet requirements while operating in the ECA.

Section 6: Safety, Health, and Sanitation
For background please see the associated sections of the guidebook.

Subsection 1: Information
Seasonal Item: 6.1.a
Text: Title of potable water contact:

What to enter: Title (not name) of the person responsible for potable water.

Seasonal Item 6.1.b
Text: Production of potable water per source (estimate percentages)

What to enter: How much water on average is produced? What is the rough estimate of production by source? This is useful to ADEC when permitting to compare production with treatment capacity to determine adequate capacity for treatment (water balance).

Subsection 2: Documentation
Seasonal Item: 6.2.a
Text: Records of onboard treatment

What to enter: Records should be kept, please provide name used for the records.

Seasonal Item: 6.2.b
Text: Bunker water bunkering / loading recordkeeping

What to enter: Name of records of bunkering events.

Subsection 3: Material Conditions
Seasonal Item: 6.3.a
Text: Potable water hose storage locker maintained in good repair with doors closed when not in use IAW Vessel Sanitation Program Operations Manual USPHS CDC
Text: Potable water hose storage locker:
Background: Dedicated stored of potable water hoses only in enclosed dedicated storage. To keep the hoses protected and clean and prevent unsanitary conditions. Often the locker bulkhead are mounted close to the potable water bunker stations.
What to check: Check that storage is a dedicated store for potable water hose only and is clean and identified with a sign: "Potable Water Hose and Fitting Storage". The locker must be closed (door) . The locker cannot be used for other storage purposes other than potable water hoses , fittings, sanitizers buckets etc. The locker should be off the deck at least 18 inches and self draining.

►Tip: The locker should be clean, inside and well maintained. Some lockers include potable water hose related tools (coupling spanners etc.) that are allowed if related to the potable water hoses/ connections.

Seasonal Item: 6.3.b

Text: Ship rails not less than 42 inches above cabin deck IAW 46 USC 3507 (a (1))?

Background: The Cruise Vessel Security and Safety Act of 2010 applies to large cruise ships (over 250 passengers) and include several items relating to passenger and crew safety. This federal law applies to US and foreign passenger vessels. Note- you do not need to check every railing. This is an opportunity check to do while performing other duties.

What to enter: Enter SAT if satisfactory.

Citation: 46 USC Sec. 3507 Passenger vessel security and safety requirements

(a) Vessel Design, Equipment, Construction, and Retrofitting Requirements. -

(1) In general. - Each vessel to which this subsection applies shall comply with the following design and construction standards:

(A) The vessel shall be equipped with ship rails that are located not less than 42 inches above the cabin deck.

(B) Each passenger stateroom and crew cabin shall be equipped with entry doors that include peep holes or other means of visual identification.

(C) For any vessel the keel of which is laid after the date of enactment of the Cruise Vessel Security and Safety Act of 2010, each passenger stateroom and crew cabin shall be equipped with -

(i) security latches; and

(ii) time-sensitive key technology.

(D) The vessel shall integrate technology that can be used for capturing images of passengers or detecting passengers who have fallen overboard, to the extent that such technology is available.

(E) The vessel shall be equipped with a sufficient number of operable acoustic hailing or other such warning devices to provide communication capability around the entire vessel when operating in high risk areas (as defined by the United States Coast Guard).

46 CFR 72.40-5 Where rails required.

(a) All passenger vessels shall have efficient guard rails or bulwarks on decks and bridges as follows: The height of rails or bulwarks shall be at least 39 1/2 inches from the deck. At the peripheries of the freeboard and superstructure decks and at the peripheries of all decks accessible to passengers, rails shall be in at least three courses including the top. The opening below the lowest course shall not be more than 9 inches. The courses shall not be more than 15 inches apart. In the case of ships with rounded gunwales the guard rail supports shall be placed on the flat of the deck. On other decks and bridges the rails shall be in at least two courses, including the top, approximately evenly spaced.

(b) Where the height of the rails interferes with the business of the vessel, as in the case of a sport fishing vessel, other arrangements may be specifically approved by the Commandant. However, in general, the effective rail or bulwark height above the deck on which the passengers stand shall be at least 30 inches.

(c) On the passenger decks of ferryboats, excursion vessels, and vessels of a similar type, the space below the top of the rail shall be fitted with suitable wire mesh or the equivalent. Depending upon the type of construction, the lower rail courses may not be required.

Seasonal Item: 6.3.c

Text: Visual identification means in passenger and crew cabin doors IAW 46 USC 3507 a(1)). (Y/N)

Background: The Cruise Vessel Security and Safety Act of 2010 applies to large cruise ships (over 250 passengers) and include several items relating to passenger and crew safety. This new federal law applies to US and foreign passenger vessels.

Cabins door must have some way to identify who is at the door; it could be a peep hole device, a video system, or other device. Although not written into the citation, the idea was that this should

be a one-way view out of the cabin, not a way for crew or passengers to look into a cabin. Note- you do not need to check every door. Check when possible that cabin doors to public areas have some means of viewing outside. It may be that the only check for the functionality of these devices can be made from your cabin. For citation see item above.
What to enter: Enter SAT if satisfactory.

Seasonal Item: 6.3.d

Text: Facilities are convenient, accessible, cleaned and stocked.
Background: This regulation applies to commercial passenger vessels selling tickets in the United States.
What to enter: Enter SAT if toilet faculties are accessible, sanitary, and cleaned and stocked regularly.
Citation: 21 CFR 1250.90 Toilets and lavatories.
Toilet and lavatory equipment and spaces shall be maintained in a clean condition.

Seasonal Item: 6.3.e

Text: Toilet rooms are ventilated with self closing door.
Background: See item above, this is a check if facilities are sanitary.
What to enter: Enter SAT if ventilated and self-closing doors.

Seasonal Item: 6.3.f

Text: There is complete separation of food and food equipment / utensils from living quarters, laundry.
Background: Basic sanitation check of food preparation. This is a very old inspection item from the 1930's and seems to relate to concern of people living and sleeping in same space where food is prepared. Cruise ships have modern sanitation practices so this has not been an issue.
What to enter: Enter SAT if galley is separated from living quarters and laundry.
Citation: 21 CFR 1250.22 General requirements.
All food and drink served on conveyances shall be clean, wholesome, and free from spoilage, and shall be prepared, stored, handled, and served in accordance with the requirements prescribed in this subpart and § 1240.20 of this chapter

Seasonal Item: 6.3.g

Text: Floor, walls, and ceilings are clean (food preparation area).
Background: Basic check of the food preparation area for sanitation. Like 3.6.f this should not be an issue, as cruise ships are regularly cleaned and inspected.
What to enter: Enter SAT if walls, ceiling, and floors are relatively clean.
Citation: 21 CFR 1250.22 General requirements.
All food and drink served on conveyances shall be clean, wholesome, and free from spoilage, and shall be prepared, stored, handled, and served in accordance with the requirements prescribed in this subpart and § 1240.20 of this chapter

Seasonal Item: 6.3.h

Text: Phosphate free detergents and non toxic degreasers are used in sculleries and galleys (EPA defines free less than 0.5% phosphates) (EPA VGP 5.1.1.1.3& 5.2.1.1.3)? (Y/N)
Background: This is an EPA VGP item, more info is in the wastewater section. It is placed here with other galley items for convince. The purpose for this requirement is to reduce the input of phosphate into waters. Phosphate is a nutrient that is often limited. Adding phosphate to an aquatic

system can increase biological activities, which could deplete oxygen available in the water. The check for "non-toxic" is to reduce the input of toxic materials into the water. Check that cleaners used have less than 0.5% phosphates listed as an ingredient. This can be on the bottle or MSDS or product sheet. Check that degreasers are non-toxic.

Note- from the list that is referenced for non-toxic in the VGP please check if any of the following applies:

- Is it labeled "Extremely flammable?
- Does it contain carbon tetrachloride?
- Does it contain 10 percent or more by weight of sodium and/or potassium hydroxide?
- Does it contain cyanide salts?
- Does it contain lead paints?

What to enter: Enter SAT if low-phosphate detergents are used.

Citation: EPA VGP 5.1.1.1.3 Sculleries and Galleys

Cruise ship owner/operators must use detergents that are phosphate free. Degreasers must be non-toxic if they will be discharged as part of any waste stream.*(Note- 5.2.1.1.3 is identical but for under 500 passengers)*

"Non-toxic" soaps, cleaners, and detergents means these materials which do not exhibit potentially harmful characteristics as defined by the Consumer Product Safety Commission regulations found at 16 CFR Chapter II, Subchapter C, Part 1500.

"Phosphate Free" soaps, cleaners, and detergents means these materials which contain, by weight, 0.5% or less of phosphates or derivatives of phosphates.

"Toxic and hazardous materials" means, for purposes of the VGP: any substance identified in 40 CFR 116.4; any toxic pollutant identified in 40 CFR 401.15; and any hazardous material as defined in 49 CFR 171.8""

Subsection 4: Operations and Procedures

Seasonal Item: 6.4.a

Text: Safety procedures for hazardous materials handling / chemicals are onboard and available IAW 40 CFR 262.34

Background: See safety section in the guidebook.

What to enter: Enter SAT (satisfactory) if procedures are available.

Seasonal Item: 6.4.b

Text: Person in charge of these plans is designated.

What to enter: Enter SAT if safety plans are in place with a designated person.

Terms, Abbreviations, and Acronyms for the Ocean Ranger Program

15 PPM Alarm: An alarm that activates when the effluent passing though oil-filtering equipment exceeds 15 parts per million (ppm) of oil.

Agent: Vessel representative hired by the ship's owners. Ship's agent may be tasked with various jobs such as: ensuring proper vessel documentation and compliance.

Alaska Waters: For wastewater from large cruise ships means all waters within the boundaries of the state together with all of the waters of the Alexander Archipelago even if not within the boundaries of the state.

Alexander Archipelago Waters: These are the "inside waters" of Southeast Alaska, even when more than 3 nm from land. Please see the list in the General Permit or statutes for a complete description of boundaries.

Automatic Stopping Device: Is a control mechanism that ensures discharge of an oily water separator is stopped when the oil content of the effluent exceeds 15 parts per million (PPM). The automatic stopping device may be initiated by the operation of the oil content meter.

AWTS: Advanced Wastewater Treatment System. A wastewater treatment system designed to treat wastewater to both MSD and secondary treatment standards. The secondary treatment standards require a higher removal of solids and nutrients (as measured by BOD) than a basic MSD. Most AWTS systems contain mechanical separation of solids by filtering or settling, a biological process to digest organic wastes, and a UV or ozone system to kill bacteria without using chlorine.

Bacteria: (Singular: bacterium) Microscopic living organisms that can aid in pollution control by metabolizing organic matter in sewage, oil spills or other pollutants. However, bacteria in soil, water or air can also cause human, animal and plant health problems.

Ballast: Used to improve the stability and control the draft of a ship.

BAT/BACT: Best Available Technology or Best Available Control Technology. The best available economically achievable performance for control of pollutants. This can include changes to process operations and internal controls.

Black Water (sewage) Examples - possible sources toilets, urinals and drainage from medical facilities (U.S. restriction).

Bilge Water: Water that collects in the lowest inner part of a ship's hull. Bilge water is frequently contaminated with oil and other lubricants from the engine room. Under various national and international standards, discharged bilge water must not exceed a certain maximum oil concentration (for example, 15 parts per million).

Biological Oxygen Demand (BOD): An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by biological processes breaking down organic waste.

Black Water: Water contaminated with human waste, collected from shipboard toilets. Under various national and international standards, black water must be treated before being discharged from a vessel.

Chemical Oxygen Demand (COD): A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.

COMS: Continuous Opacity Meters. A system that electronically reads (with sensors) the density of the smoke in the stacks, and records the findings (as % opacity). Often these systems can generate opacity thresholds / alarms.

Conductivity: A measure of the ability of a solution to carry an electrical current.

Conventional Parameters: Pollutants typical of municipal sewage. BOD, TSS, bacteria, oil and grease, and pH are defined as conventional by EPA. ADEC and USCG added suspended solids, ammonia, conductivity, chlorine, ammonia, phosphorus, total organic carbon, and chemical oxygen demand to the list of conventional parameters.

CVE: Control Verification Examination is the examination of vessel for compliance with SOLAS requirements and applicable U. S. regulations. More properly referred to as the Passenger Vessel Certificate of Compliance Examination.

Discharge: means any release, however caused, from a commercial passenger vessel, and includes any escape, disposal, spilling, leaking, pumping, emitting, or emptying.

Dispersion: The breaking up of an oil slick into small droplets which are mixed into the water column as a result of breaking waves and other sea surface turbulence.

DMR: Discharge Monitoring Report, a report submitted to ADEC listing wastewater sample results and any violations of the General Permit, VSSP, or QAPP.

Effluent: To flow out. (Waste material, refuse, and sewage)

Emulsification: The formation of a water - in - oil mixture. In the environment, the tendency for emulsification to occur varies with different oils and is much more likely to occur under high-energy conditions (wind and waves). Emulsions may also be formed by surfactants, including detergents, which cause the oil and water to mix, or by mechanical means such as pressure washing or pump action.

ECA: Emissions Control Area.

EPA VGP: The Environmental Protection Agencies Vessel General Permit.

Equipment having an oil to sea interface: Equipment that uses a seal to prevent leakage of oil into the sea. Examples, oil-lubricated stern tube seals, hydraulically-driven stabilizer fin seals, bow and stern thruster seals. An indicator that system seals are leaking to the sea may be evidence of frequent filling of system reservoirs, presence of barrels, drums, hoses, pumps, and other

equipment/supplies/arrangements necessary to refill systems. Some ships' SMS or environmental compliance programs may require that records of refilling such systems are kept. If so, these records should be checked.

Fecal Coliform Bacteria: Bacteria found in the intestinal tracts of mammals. Their presence in water or sludge is an indicator of pollution and possible contamination by pathogens.

Garbage (from 33 CFR 151): *Garbage* means all kinds of victual, domestic, and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically, except dishwater, graywater, and those substances that are defined or listed in other Annexes to MARPOL 73/78.

General Permit: The State of Alaska General Permit for the Marine Discharge of Treated Sewage and Treated Graywater from Commercial Passenger Vessels Operating in Alaska.

Geometric mean: The nth root of the product of a series of n numbers computed by taking the logarithm of each number, computing the arithmetic mean of the logarithms, and raising the base used to take the logarithms to the arithmetic mean.

Glacier Bay: All waters inside a line drawn between Point Gustavus at 135º54.927' W longitude; 58º22.748' N latitude and Point Carolus at 136º2.535' W longitude; 58º22.694' N latitude.

Gray Water: Includes discharges from galley, sinks, washbasins, drains, showers and baths. These may be held in large tanks prior to being discharged overboard (State, Fed, regulation permitting).

Gray water system: includes discharges from galley, sinks, washbasin drains, showers, and baths, excluding drains and sinks from medical spaces.

ICLL: International Convention for Load Lines.

IMO: International Maritime Organization; a specialized agency of the United Nations concerned solely with maritime affairs. IMO is responsible for international treaties, conventions, resolutions and codes to improve maritime safety.

ISM Code: International Safety Management Code. (Chapter IX of SOLAS)

Harmful substance (from 33 CFR 151): *Harmful substance* means any substance which, if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life, damage amenities, or interfere with other legitimate uses of the sea, and includes any substance subject to control by MARPOL 73/78.

Hazardous waste: includes wastes the EPA has determined are dangerous or potentially harmful to your health or the environment.

Marine sanitation device: Equipment that is installed on board a vessel, and that is designed to receive, retain, or discharge sewage; and any process to treat sewage on board a vessel.

MARPOL: Name given to the standards and requirements adopted by the International Convention for the Prevention of Pollution from Ships governing the discharge of oil and other hazardous substances, sewage, and garbage.

mg/L: **Milligrams per liter**. The concentration at which one thousandth of a gram (10-3 g) is found in a volume of one liter; it is approximately equal to the unit "parts per million (ppm)".

µg/L: Micrograms per liter: The concentration at which one millionth of a gram (10-6 g) is found in a volume of one liter; it is approximately equal to the unit "parts per billion (ppb)".

MSC: Maritime Safety Committee. One of five technical committees of the IMO which deals with issues such as aids to navigation, vessel equipment and construction, manning requirements, handling dangerous cargoes, hydrostatic and marine casualty information.

MSD: Marine Sanitation Device.

Non-hazardous waste: includes shipboard garbage including plastics and synthetic material, medical waste, food wastes and recyclables such as glass, cardboard, aluminum and metal cans. Items to be checked should include: disposal and incineration records; waste sorted to prevent hazardous waste from entering the non-hazardous waste stream; no plastics or synthetics discharge overboard; separate and proper disposal of hazardous and non-hazardous incinerator ash; and proper disposal of cooking grease from grease traps.

Offloading: means the removal of a hazardous substance, hazardous waste, or nonhazardous solid waste from a commercial passenger vessel onto or into a controlled storage, processing, or disposal facility or treatment works

Oil (from 33 CFR 151): *Oil* means petroleum whether in solid, semi-solid, emulsified, or liquid form, including but not limited to, crude oil, fuel oil, sludge, oil refuse, oil residue, and refined products, and, without limiting the generality of the foregoing, includes the substances listed in Appendix I of Annex I of MARPOL 73/78. "Oil" does not include animal and vegetable based oil or noxious liquid substances (NLS) designated under Annex II of MARPOL 73/78.

Oil Content Meter: An instrument used to measure continuously the oil content of the effluent in the OWS output line, in parts per million, to ensure that the operation does not contravene the convention.

Oil Filtering Equipment: Equipment that uses any combination of a separator, filter or coalescer, and also a single unit designed to produce an effluent with oil content less than 15 parts per million (ppm).

Oil pollution prevention systems: include the oily water separator, the fuel/lubricating oil transfer, and sludge containment system.

Oily Water Separator (OWS): Equipment designed to separate oil from wastewater such as bilge water.

pH: An expression of the intensity of the basic or acid condition of a liquid; may range from 0 to 14, where 0 is the most acid and 7 is neutral.

Plastic (from 33 CFR 151):*Plastic* means any garbage that is solid material that contains as an essential ingredient one or more synthetic organic high polymers, and that is formed or shaped either during the manufacture of the polymer or polymers or during fabrication into a finished product by heat or pressure or both. "Degradable" plastics, which are composed of combinations of degradable starches and are either (a) synthetically produced or (b) naturally produced but harvested and adapted for use, are plastics under this part. Naturally produced plastics such as crabshells and other types of shells, which appear normally in the marine environment, are not plastics under this part.

Pollutant: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems..

PMS: Preventative Maintenance System

Primary Waste Treatment: First steps in wastewater treatment; screens and sedimentation tanks are used to remove most materials that float or will settle. Primary treatment removes about 30 percent of carbonaceous biochemical oxygen demand from domestic sewage.

QAPP: Quality Assurance Project Plan. An approved plan documenting how samples are taken and the quality control measures taken to ensure samples are accurate and representative.

Qualified Individual (QI): The person authorized by the responsible party to act on their behalf, authorize expenditures and obligate organization's resources.

RCRA: Resource Conservation and Recovery Act (RCRA), was enacted by the U.S. in 1976 to address the issue of how to safely manage and dispose of the huge volumes of municipal and industrial hazardous waste generated nationwide.

Recoverable Oil: Oil that is in a thick enough layer on the water to be recovered by conventional techniques and equipment. Only black or dark brown oil, mousse, and heavy sheens (dull brown) are generally considered thick enough to be effectively recovered by skimmers.

SECA: Sulfur Emission Control Area

Separation Equipment: A device designed to remove enough oil from an oil-water mixture to provide a resulting mixture with an oil content of less than 100ppm, or 15ppm, such as an Oily Water Separator (OWS).

Sewage: Human body wastes and the wastes from toilets and other receptacles intended to receive or retain human body wastes.

Sheen: A sheen is a very thin layer of oil (less than 0.0001 inches or 0.003mm) floating on the water surface and is the most common form of oil seen in the later stages of a spill. According to their thickness, sheens vary in color ranging from dull brown for the thicker layers to rainbows, grays silvers and almost transparent for the thinnest layers.

Slick: Oil spilled on the water, which absorbs energy and dampens out the surface waves making the oil appear smoother or slicker than the surrounding water.

Sludge Tanks: Tanks used to contain sludge formed by fuel and lube oil purifiers and from other sources or cleaning activities. Sludge is not readily processed by many oily water separators and frequently requires treatment ashore or incineration. Every ship of 400 GT or more must be provided with a tank or tanks of adequate capacity, in regard to type of machinery and length of voyage, to receive the oil residues (sludge) that cannot be dealt with otherwise in accordance with MARPOL Annex I.

SMS: Safety Management System (sometimes referred to as an SQM). Required by the ISM Code and Chapter IX of SOLAS.

SOLAS: Safety of Life at Sea. The International Convention for the Safety of Life at Sea.

SOPEP: Shipboard Oil Pollution Emergency Plan. (MARPOL Annex I, Reg. 26)

STCW: The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

Suspended Solids: Small particles of solid pollutants that float on the surface of, or are suspended in, sewage or other liquids. They resist removal by conventional means.

Total Suspended Solids (TSS): A measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for "total suspended non-filterable solids."

Transfer: Any movement of oil or hazardous material to, from or within a vessel by means of pumping, gravitation, or displacement.

Tributyltin Paints: TBT-based marine antifouling paint or coating means a paint, coating, or treatment that contains tributyltin, or a triorganotin compound used as a substitute for tributyltin.

Vessel Specific Sampling Plan (VSSP): This is an approved plan specific to each cruise ship that documents how wastewater is treated, stored, and sampled to ensure samples are representative of discharged wastewater.

VE: Visible Emissions. This is what is visible in the exhaust emissions (smoke). Measured by looking at the opacity of the emissions.

Acronyms/Abbreviations Used

ADEC	Alaska Department of Environmental Conservation
AS	Alaska Statute
BNA	Base/Neutrals, Acids
BOD	Biochemical Oxygen Demand – 5-day
CFR	Code of Federal Regulations
COC	Chain of Custody
COC	Certificate of Compliance, CG Form 3585.
COTP	Captain of the Port.
COD	Chemical Oxygen Demand
CWA	Clean Water Act.
DQO	Data Quality Objective
ECA	Emission Control Area
EPA	Environmental Protection Agency
GP	Alaska DEC Large Cruise Ship general Permit
MDL	Method Detection Limit
MSD	Marine Sanitation Device
OR	Ocean Ranger
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
QC	Quality Control
RPD	Relative Percent Difference
RQ	Reportable Quantity per 40 CFR part 302
SM	Standard Methods
SW-846	Solid Waste Methods
SOP	Standard Operating Procedures
TSS	Total Suspended Solids
USCG	US Coast Guard
VOC	Volatile Organic Chemicals
VGP	EPA Vessel General Permit
VSSP	Vessel Specific Sampling Plan

Additional Wastewater Definitions and information

Definitions of permitted discharges

- **Within Alaska waters**
  Cruise ships need a notice of intent (signed version) and a General Permit issued by the State of Alaska. They also need an authorization letter from the USCG (33CFR 159).
  In general, if vessels want to discharge In Alaska, they need to be capable of meeting the Alaska discharge standards (Table 1 of the general permit)
- **Outside of 3 mile limit**
  This is outside the jurisdiction of the State of Alaska. Most vessels use the "4 mile" limit to make sure that they are clear from state boundaries. (some VSSP plans and discharge plans make reference to a 4 mile limit) IMO allows materials to be discharged that are comminuted and disinfected waste at a speed of 4 knots.
- **Outside 12 mile limit**
  International waters where discharges of gray and black water, biomass, etc are allowed to be discharged at 4 knots speed or higher.
- **Donut Holes**
  In the past definitions of Alaska waters, there were several areas within the islands of Southeast Alaska that were more than 3 miles from land. The cruise ships used these donut holes to discharge their waste water and then proceeded on their way. The concept of donut holes has been eliminated by the current definitions of Alaskan waters.

Restricted Zones

- **Glacier Bay** - this is a no discharge area for most operators. Vessels navigating in Glacier Bay need a NPS authorization.
- **Tracy Arm –** voluntary no discharge zone. This is a wilderness area for the US Forest Service – most vessels opt not to discharge while navigating in Tracy Arms area (including Endicott arms).

Usage of double bottom tanks not on VSSP for storing waste water

This information will be included in the current VSSP. Ocean rangers should make a note of which tanks are in use for waste water storage and compare this information to the VSSP. Any discrepancies should be pointed out on the daily report as a potential non-compliant item.

Burials at sea (40 CFR 229.1):

This has been a regular question. There are no specific ADEC requirements for disposal of cremated remains, other than no discharge of plastics. Burials must meet USCG and EPA requirements. Flowers and wreaths can be placed in the waters if they are "readily decomposable". Ashes are sometimes held in plastic bags inside the urns, these are often accidentally dropped in burials at sea.

Harvesting Glacier Ice

Ice in small amounts can be "harvested" from the Glacier areas; During the "harvest" the wildlife should not be disturbed, that would be a violation; Note that in Glacier Bay, a permit / authorization must be obtained from National Parks Service to launch a lifeboat / tender in Glacier Bay waters. (Small quantities of ice are sometimes brought onboard the cruise ships to show the passengers what glacier ice looks like.)

Wastewater treatment systems (AWTS) general descriptions:

A Marine Sanitation Device (MSD) is a USCG and MARPOL regulatory description of a system designed to treat sewage to specific levels of effluent quality. Most marine engineers have worked with MSD II systems onboard of cargo and other vessels. These MSD systems are relatively simple and often laid out for small capacities. MSD II systems are required to meet limits of 200 fecal bacteria units and 150 mg/L of total suspended solids during certification. Another type of MSD is the MSD III, which is a system designed for no discharge overboard, either holding, reusing the water, or incinerating the waste and boiling off the water.

ADEC and the USCG determined that MSD IIs on cruise ships often did not meet the certification limits as used onboard, which led to the creation of Advanced Water Treatment Systems (AWTS).

Cruise vessels that discharge wastewater in Alaska have "special" MSD II systems that are designed for treating for biochemical oxygen demand, removing most solids, and discharging at low levels of chlorine. Because these systems newer designs compared to most MSD II systems they are called "Advanced Wastewater Treatment Systems". Some systems utilize parts of the earlier MSD II systems, and can be regarded as upgraded with additional equipment. Graywater is also treated with these systems. The AWTS processes are often microbiological processes, where the "bugs" do the work, with the needed environment to do their work. The AWTS systems use ultraviolet light (UV) or ozone to kill any remaining bacteria growth after treatment. These systems have the potential to reduce other pollutants as well.

When looking at the WW treatment elements it is often easier to understand the system by looking at specific parts that may be familiar to a marine engineer. A quick and sound understanding of the AWTS system can be obtained by asking questions, by reading the Vessel Specific Sampling Plan (VSSP) and onboard AWTS documentation, and witnessing AWTS operations and maintenance.

In general we can split the WW treatment processes on board into the following:

- Pre screening: Removal of solids and other "large items" that are not allowed to get into the treatment system.
- Biological and further mechanical treatment. First stage / second stage bioreactor including membranes, flotation, or other filtration methods; and
- Polishing after the treatment process (UV or ozone and sometimes ion exchange).

Note that some process components are integrated in the ship systems, like process tanks.

There are several types (manufactured by different vendors) of AWTS system and each has its own particulars, for example the Zenon and Hamworthy systems rely on membranes but those membranes are different. The Rochem graywater system uses reverse osmosis technology. By checking the process elements, a quick feel of the AWTS installation and how it is operated can be obtained. This will make effective compliance verification and reporting much easier.

Tips for quick familiarization of the AWTS process:

- Follow the influent flow and steps the influent takes. What goes in and out? A quick sketch can help to visualize the process.
- What is added besides the influent to the wastewater to process? Are there other WW flows? Are process chemicals added?
- After this is done, piece the parts together that play a role in the process as well as the circulation flows.
- Check on why process parts / elements are used? Are there process conditions that trigger additional process chemicals?

- Vessels sometimes use other names for AWTS process components than what they actually are, for example a screen press is sometimes called "the wormer" or "the weir".
- Check the AWTS system with the VSSP description. Some VSSP's are really detailed.
- Some Vendor descriptions are general, or ship installation specific. If you notice differences compared to the VSSP or other AWTS installation descriptions ask and document the results.

Putting the AWTS system in context:

- AWTS performance is heavily dependent on the system status (maintenance) and operations.
- Check on what the AWTS systems really process; tank arrangements, daily operations should reflect the process of the AWTS.
- Always report AWTS observations in context with the where, when, and why.
- Do not hesitate to ask questions about the AWTS operations. If these operations are changed or altered, document the changes.
- If the VSSP contains discrepancies or errors, report these immediately and provide the corrected or revised information.

AWTS Systems in Alaska in 2015

AWTS	Treatment					Permitted Vessels in 2015	Installations in Alaska in 2015
	Primary Solids Separation	**Secondary** Microbial Oxidation	**Tertiary** Clarification		**Disinfection**		
Hamworthy Bioreactor	Screen Press	Aerobic Biological Oxidation (Membrane Bioreactor)	Ultrafiltration Membranes		UV	8	8
Scanship	Wedgewire Screen	Aerobic Biological Oxidation (Moving Bed Bioreactor)	Dissolved Air Flotation (DAF) / Polishing Filter		UV	4	4
Zenon	Coarse Screen	Aerobic Biological Oxidation (Membrane Bioreactor)	Ultrafiltration Membranes		UV	3	3
Rochem	Vibratory Screens	Low Pressure Reverse Osmosis (LPRO)	Reverse Osmosis Membranes		UV	0	0
Rochem Bio-Filt	Vibratory Screens	Aerobic Biological Oxidation (Membrane Bioreactor)	Ultrafiltration Membranes		UV	1	?
Marisan 250	Coarse Screen	Chemical Coagulation	Dissolved Air Flotation (DAF) / Microfiltration		Ozone	1*	1
Hydroxyl Cleansea	Coarse Drum Filter	Aerobic Biological Oxidation (Moving Bed Bioreactor)	Dissolved Air Flotation (DAF) / Polishing Filter		UV	0	?
Ovio	Vibratory Screens	Ultrafiltration	Reverse Osmosis Membranes		UV	0	1
Triton	Screening	Aerobic Biological Oxidation (Membrane Bioreactor)	Ultrafiltration	Ion Exchange	UV	1	1
Navilis	Vibratory Screens	Aerobic Biological Oxidation	Chemical flocculation/ Ultrafiltration Membranes/ Ozone		UV	0	?

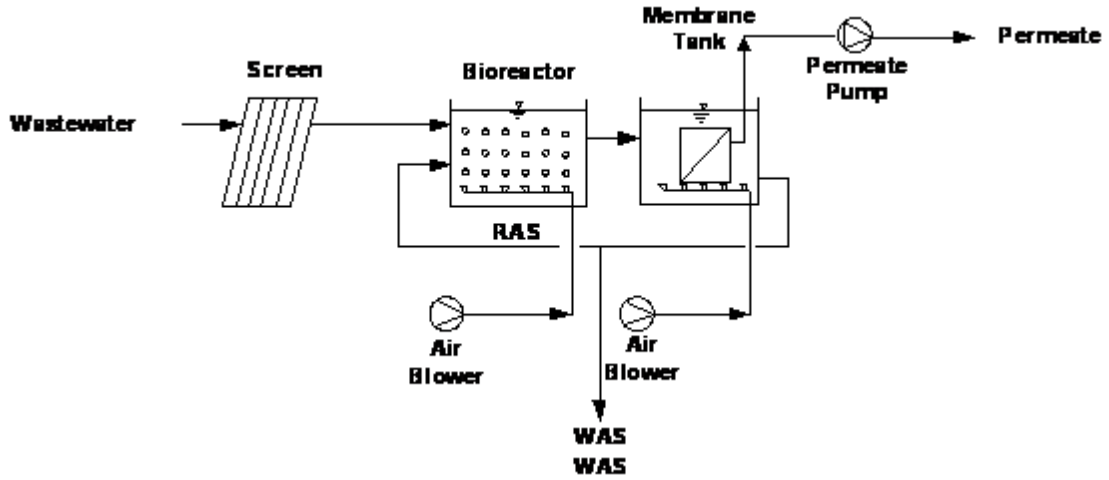
* The Silver Shadow did not discharge in 2015, but was permitted to.

There are two main types of AWTS, membrane bioreactors (MBR) and moving bed bioreactors (MBBR). An MBR has a bioreactor followed by a membrane based filtration system. MBR systems include Zenon and Hamworthy. Scanship is a MBBR.

►**TIP:** The VSSP often describes the AWTS system and arrangements

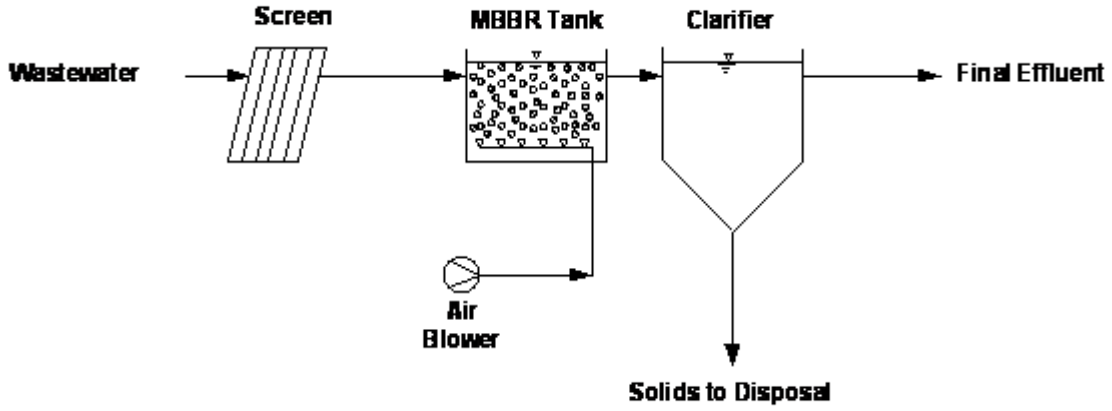
►**TIP:** Non-discharging vessels may not have an AWTS or a working / operable AWTS. However, there must a MSD II (for Black water) on board of these vessels (IMO Annex V)

Figure 1: Membrane Bioreactor (MBR)



A moving bed bioreactor (MBBR) uses media such as plastic balls to provide a surface for biomass growth. A MBBR bioreactor can be followed by filtration. Scanship utilizes a moving bed bioreactor.

Figure 2: Moving Bed Bioreactor (MBBR)



Hamworthy AWT System

Disney Wonder, Coral Princess, Crown Princess, Golden Princess (split system with modifications), Grand Princess (split system), Island Princess, Ruby Princess (split system), Star Princess (split system)
(Note- some systems are configured differently such as the Golden Princess, and systems can have 2 or 3 MBRs)

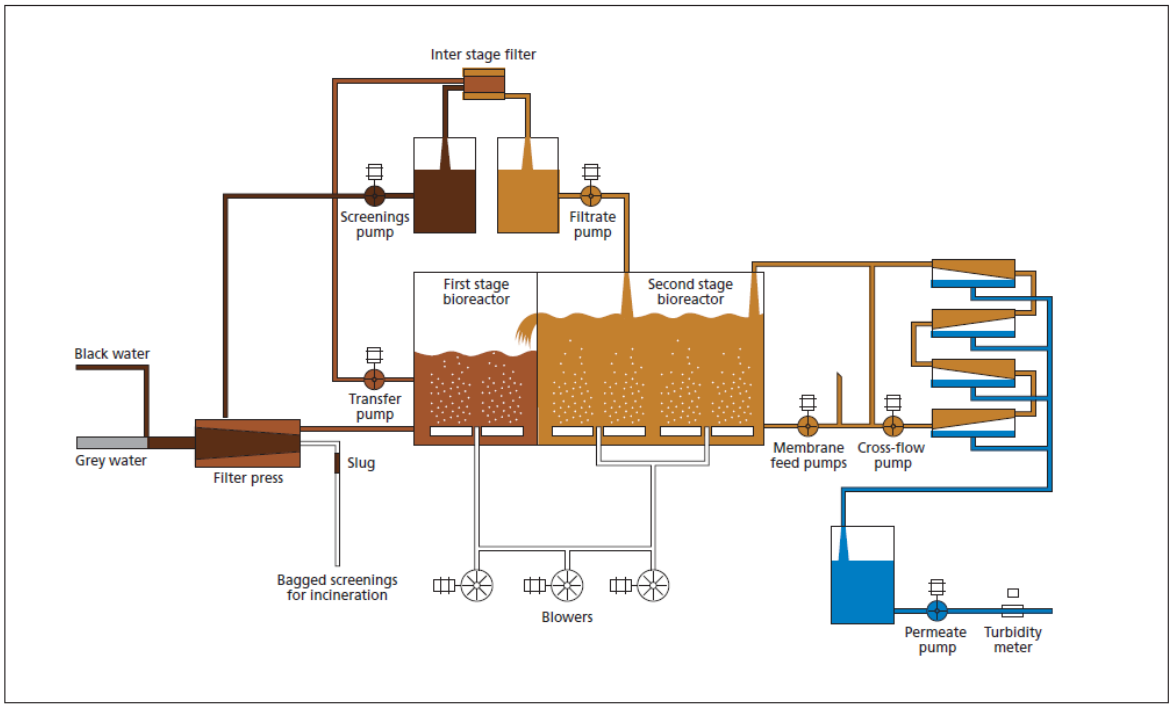
Hamworthy AWT system is based on Membrane BioReactor technology (MBR) using Hamworthy membranes. This system uses biological digestion to reduce BOD along with ultrafiltration using membranes to reduce solids discharged. UV units are used to kill remaining bacteria and after growth in the pipes. **Note:** There are several types or generations of MBR systems in use. All the Hamworthy units have basically the same MBR membrane technology. However, per installation (generation) the layout and inter-stage filter function can vary. There are at least three generations of Hamworthy systems currently operated.
Blackwater is delivered directly from the collecting EVAC tanks to the MBRs. Graywater from accommodations is delivered from the dedicated graywater collection tanks and then to one of two MBR buffer tanks where the greywater is provided with some aerobic aeration through the usage of

blowers. The graywater and blackwater are then mixed into a common line before entering the MBRs. Graywater from the galleys and laundry are not treated by the MBRs and is held into double bottom tanks.

The Hamworthy system has an MBR 1st Stage Screen Press Waterlink, which filters paper, and other solids called "screenings" out of the feed. The dry waste outlet screenings are collected and placed into a bagging unit. The bagging is manually removed periodically throughout the day and delivered to the incinerator. The feed then flows into the 1st Stage of the Bioreactor which operates as an aerobic biological treatment system.

Incoming feed enters into a high strength biomass within which there is a diverse microbial ecology that breaks down and consumes the raw sewage and grey water mix. The by-products of consumption are water and carbon dioxide; the water passes through the membrane and is discharged, the carbon dioxide is vented to atmosphere along with the air that is used for the aeration of the biomass. This air supply to the biomass via fine-bubble diffusers also lowers the chemical oxygen demand. From the 1st Stage of the Bioreactor further filtering is completed in each of the two Russel Type Bag Filters. Any further solids are then redirected back to Screen Press Waterlink, and remaining filtrate is pumped to the 2nd Stage of the Bioreactor where further aeration is completed. The 2nd Stage of the Bioreactor is then pumped down via cross-flow pumps which deliver feed to the membrane modules. The final effluent is then pumped from the membranes into a permeate tank where it is then circulated thru an Ultraviolet (UV) System for further disinfection before it is finally pumped overboard to further eliminate any potential Fecal Coliform.

Figure 3: Hamworthy process diagram



►**TIP:** Hamworthy AWTS systems have different Generations/types (e.g. Mark I, II, and III). The Disney Wonder AWTs is of the latest generation Hamworthy AWTS. From type to type there are small technical differences such as interstage filters, circulation ratio, etc.

►**TIP:** Hamworthy AWTS are on some installations (PCL fleet) split into two distinct parts: 1) Section for treatment BW; 2) Section for treatment of GW. Note WW volumes treated for each Sections.

►**TIP:** BW is often diluted with a certain volume of GW. This is to make the BW more processable. The approved VSSP often includes the GW dilution volume. This is important for the representative sampling.

►**TIP:** Multi AWTS trains. Some AWTS systems consists of more than one "block/Section /Train". See VSSP document. Include in the sampling event which "train" is operated (representative sampling).

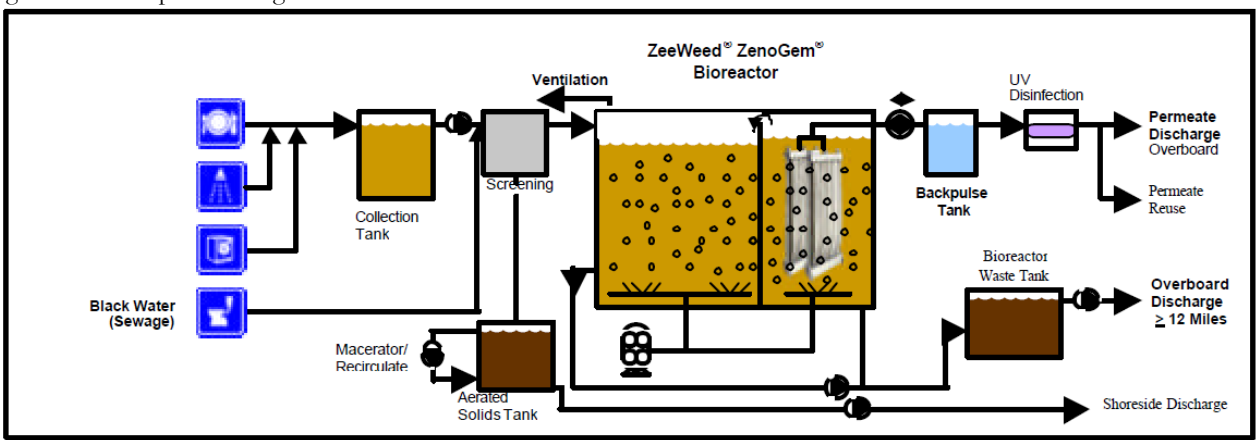
Zenon AWT system

Infinity (not discharging in AK), Statendam, Volendam, Zaandam

The Zenon AWT system uses an aerated membrane treatment system. This involves an integrated system of biological process (digestion) and filtration process black and gray water. ZeeWeed filtration membrane modules used. (barrier prevent passage of contaminants and solids) [0.035 micron / one micron is a millionth of a meter]

Note: for all AK trade vessels the Zenon AWTS systems using the same membranes (Zeeweed) and are not directly visible like the Hamworthy AWTS membranes. The Zenon system is also called an MBR system. On most vessel the locations of the membrane installation semi or totally integrated with existing tanks / spaces (during retrofit).

Figure 4: Zenon process diagram



All gray water from the accommodation plus other greywater, i.e. laundry & Somat is collected in the equalization (holding) tanks. This wastewater is then pumped with the graywater pumped to the Masko-Zoll filters. Blackwater is pumped from the Evac units to mix just before the Masko-Zoll filters.

1st Process – Solid Filters

This mixed stream of black and graywater is filtered in the Masko-Zoll screens and the screened water runs into a tank. The plastics & other solids that are filtered produce a waste stream called solid waste that is stored in a tank. This solid waste is landed ashore approximately every 4 weeks.

2nd Process – Biological

The biological process happens mainly in the bioreactor & partly in the membrane tank. This screened black and gray water (called screened raw water) is pumped out of tank by the raw water

pumps into the bioreactor. The water in the bioreactor is now known as biomass. In the bioreactor the bacteria eat the waste products and convert these into CO^2, H^2O and other products plus heat. It is necessary to waste (remove) biomass daily to keep the bacteria at the correct level. Biomass waste is transferred to DB tank. It is legally regarded as untreated blackwater and therefore may only be pumped directly overboard when >12nm from shore and underway.

3rd Process -Ultra filtration

The biomass is pumped out from the bioreactor using the recirculation pumps and into the membrane tank. It then overflows back into the bioreactor where it is subject to further biological process. Ultra filtration occurs in the membrane tank. Here permeate is drawn out of the biomass through the millions of microscopic pores in the membrane fibers (looks like hollow spaghetti) by means of the process/permeate pumps. These pumps create a very low vacuum inside the fibers of the membranes. The permeate is first used for filling up the back-pulse tanks. At 10 minute intervals this process reverses and permeate is taken out of the back-pulse tanks & is pumped back through the membranes. This is done to clean the pores in the membrane fibres.

4th Process – UV filter

Permeate that is not used in the back-pulse tanks then passes through a UV filter. The UV-unit is used for final disinfection before the water is used for other purposes e.g. technical water, or into the main ballast or simply system discharged overboard where allowed.

►**TIP:** Zenon AWTS system had aerated solids tanks initially installed. To maintain a level of "solid quality" level aeration is necessary. Is aeration still applied and sufficient? Are other tanks used that are not aerated for the storage of solids?

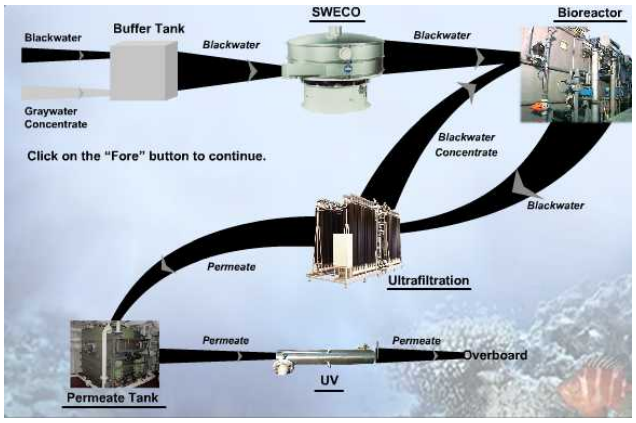
Rochem AWT System

Carnival Spirit (no longer in Alaska), Oosterdam (not discharging in Alaska), Westerdam (not discharging in Alaska- has replaced parts of the GW system)

The ROCHEM AWTS BW Plant treats black water and some graywater (for dilution purposes) in a bioreactor system, using membrane ultra-filtration, and an ultraviolet disinfection.

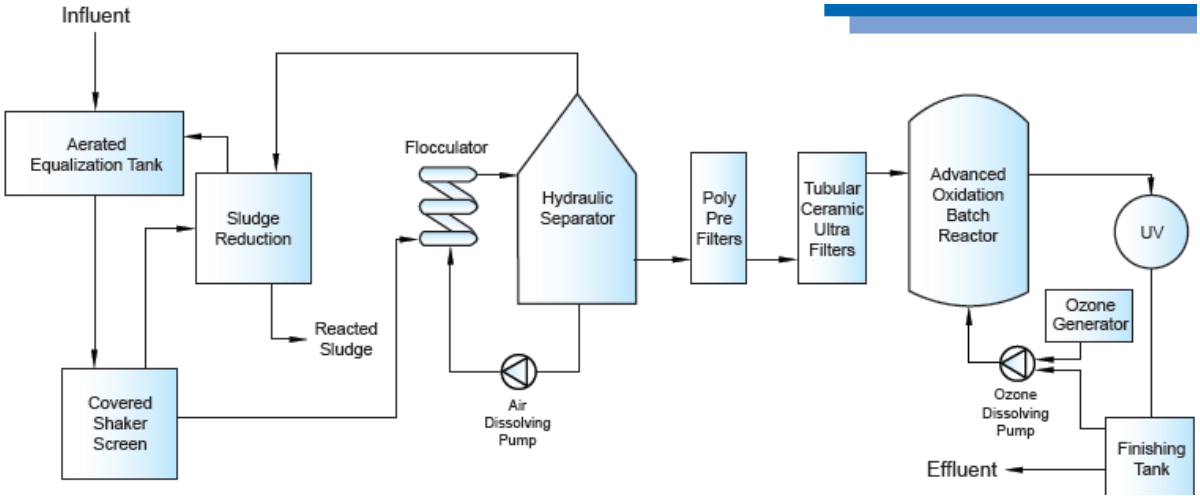
The Rochem Low Pressure Reversed Osmosis (ROCHEM LPRO 120-10) plant treats graywater by reverse osmosis in plants still in use.

Note: The RO system is similar to the RO systems that are used on board for the production of fresh water from seawater (desalination). Only the size and influent preparation is different. These systems are modular and easy to track and to follow. The Rochem systems are thus on most vessels modular installed. Some vessels (e.g. Westerdam) updated in 2011 their WW treatment installation by installation of new RO system of the Veolia brand. This RO system make uses of existing installation parts and piping. The "non modular" systems are more complex to visually follow and to inspect, however the RO principles are still the same.



Rochem blackwater treatment system (Science Panel report)

Navalis System (Rhapsody of the Seas)



This was a pilot system designed as part of the 2008 permit source reduction. The status of this system is unknown. Previous seasonal reporting documented numerous modifications and continuing fabrication and installation of AWTS parts and components.

►TIP: Check the status on board for the vessels that had "Navilus" system's installed (RCL fleet). What is the current status? Is it operable, removed, sections are operated, etc?

Scanship AWT System

Norwegian Jewel, Norwegian Pearl, Norwegian Sun, Seven Seas Navigator

Scanship Diagram (From EPA 2004 report)

ScanShip is the AWT system that does not rely on membrane or RO technology. The system is an open systems with some vessels having process elements integrated with the Scanship AWTS system, it is very simple systems and easy to follow. Scanship has advanced integrated data collection, so the major process parameters, pH, TSS, chemical use / dosage, among other process parameters. This gathered data can be direct read out and stored and is available for review (intranet). Several phases of the process have data collection points. In most cases

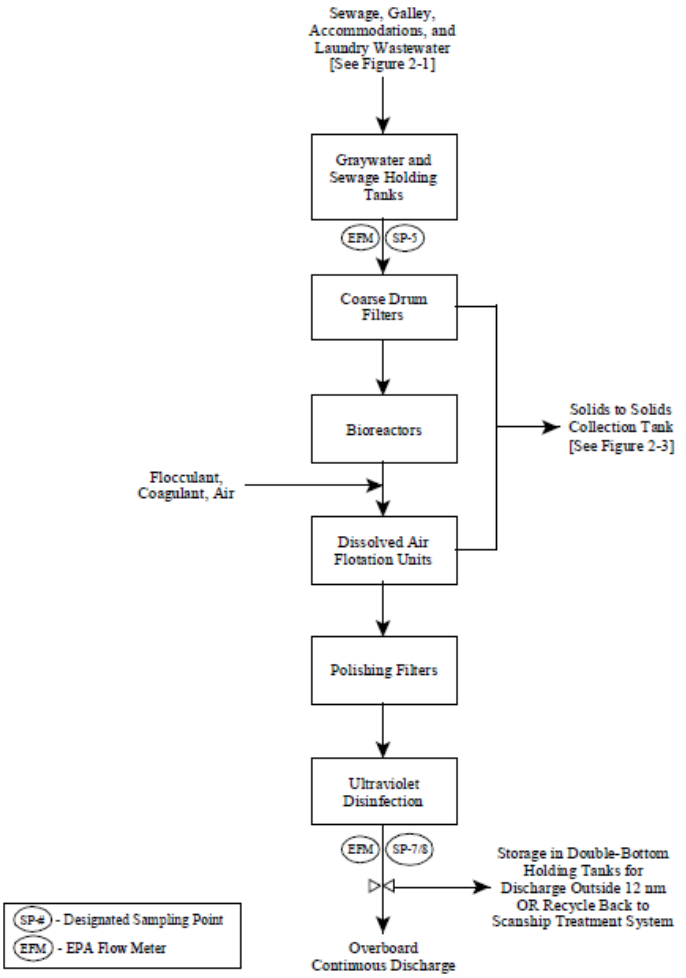


Figure 2-2. Scanship Treatment System, Norwegian Star

Simplified diagram of the Norwegian Star Scanship treatment system. See Table 2-1 for a list of wastewater streams in each wastewater source, and Figure 2-1 for their collection and conveyance to the treatment system. Note that Figure 2-2 has been modified to prevent disclosure of material for which a claim of CBI has been made.

these major process parameters are recorded on the sampling custody form for future process reference. This is not a regulatory requirement but it shows that some operators take their AWTS performance very seriously.
The Scanship AWTS stems uses a five step process:1. Screening 2. Biological 3. Floatation 4. Polishing 5. Disinfection. We will describe a Scanship process onboard one ship.
Galley water, Graywater, and laundry water are collected in GW Collection Tanks; blackwater is held in the vacuum units. All GW and BW is pumped to coarse drum screens, which removes and sends sludge and particles to sludge holding tank (Bio-sludge). From the drum screens, the water is led to a small buffer tank and is then pumped to a mixing tank.

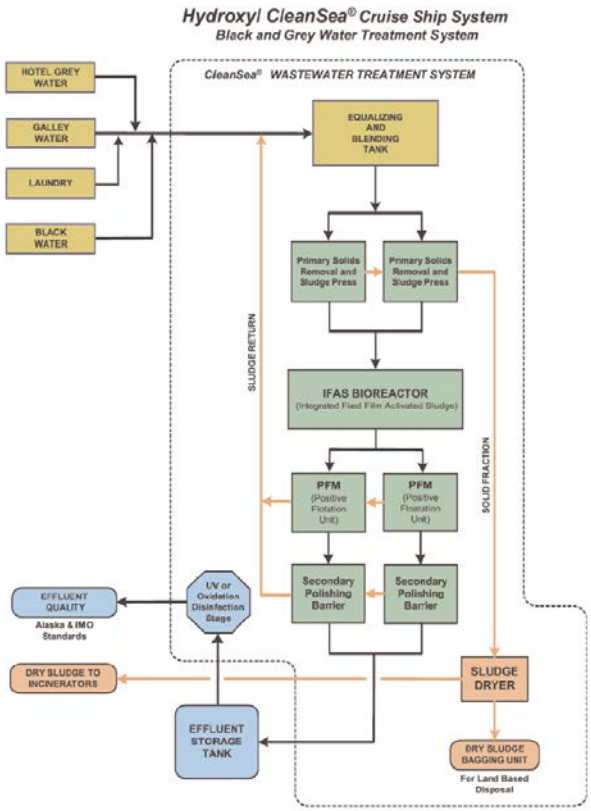
From here the water is pumped to Bio Tank 1 then to Bio Tank 2. After the bio tanks, polymer and coagulant is added into the water and pumped into the floatation module, where more sludge is separated from the water by dissolved air and pumped to a tank. The water goes from the flotation module and into the polishing screen where it is finely filtered before passing through the UV units. If the treated water after the UV Units is within the limits of the turbidity meter/ TSS (<30 mg/l limit setting) it is allowed to go overboard or to holding tanks if discharge is not permitted at that time. If it is not within the limits (TSS >30 mg/l or high or low pH), the water is re-circulated back to the mixing tank for re-treatment.

►**TIP:** Some vessels with Scanship AWTS system monitor and record the AWTS process settings on the sample custody form to check on the sample results / process settings / performance.

Hydroxyl CleanSea System

Millennium (not discharging in AK), Radiance of the Seas (not discharging in AK)

Gray and black water from mixing tank are filtered by two screen filters; the filtered wastewater is introduced into the bioreactors. The solids, which are collected by the primary screen filters, are transferred, by the solids transfer pump into the bio-residue tank. The solids that are collected into the bio-residue tank transferred by the sludge transfer pump into the two dewatering units (SOMAT) and with the help of the chemical polymer the separation of solids and water is achieved. The solids are then collected into the solids collecting tank of the SOMAT system and then transferred into the incinerator. The water that remains from the separation, is transferred by gravity into the mixing tank. The wastewater that is introduced into the bioreactors which use free floating plastic media is treated and then sent to dissolved air floatation units for solids removal. The treated permeate water passes through UV units before it is discharged into the sea or held in tanks.

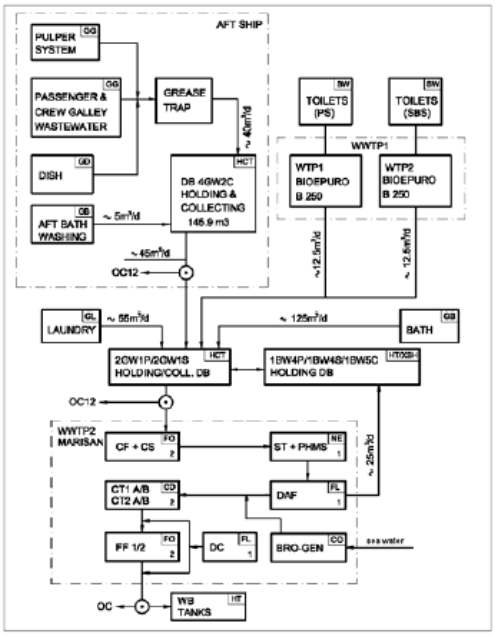


Hydroxyl waste water system diagram

Marisan AWT System

Silver Shadow (permitted but not currently discharging)

Black water are treated by two Sewage Treatment Unit BIOEPURO B250, its effluent is mixed with grey waters (coming from accommodations, galleys and laundry) and treated by AWWTP MariSanTM 250.



Silver Shadow VSSP diagram

Triton AWT System (Regatta)

The Regatta installed a new AWTS system in 2011. This system was unique in the inclusion of an ion-exchange system to reduce metals and improved configuration and processes to help reduce ammonia. In the Triton Water Membrane Reactor process, the membranes are submerged into an activated sludge reactor. Treated water is extracted through the membranes with a vacuum pump. Continuous flow passes over the membrane plates. Air is used to keep the membrane surfaces free of fouling, resulting in high flux rates.

Regatta Ion Exchange tanks (ADEC photo)