

# Ocean Ranger 2018 Report

## Commercial Passenger Vessel Environmental Compliance (CPVEC) Program



Hoonah, 2018 (photo: ADEC staff)

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**Abbreviations and Acronyms**

AAC:	Alaska Administrative Code
ADEC:	Alaska Department of Environmental Conservation
AK:	Alaska
AS:	Alaska Statute
AMHS:	Alaska Marine Highway System
BMP:	Best Management Practice
BOD:	Biological Oxygen Demand
CFR:	Code of Federal Regulations
CPVEC:	Commercial Passenger Vessel Environmental Compliance (Program)
DG:	Diesel Generator
ECA:	Emissions Control Area
EGCS:	Exhaust Gas Cleaning System
EPA:	United States Environmental Protection Agency
EU:	Emission Unit
GT:	Gas Turbine
HFO:	Heavy Fuel Oil
IMO:	International Maritime Organization
LCPV:	Large Commercial Passenger Vessel
MOU:	Memorandum of Understanding
PAH:	Polycyclic aromatic hydrocarbon
SO <sub>x</sub> :	Sulfur oxides
TSS:	Total Suspended Solids
US:	United States
USFS:	US Forest Service
UW:	Underway
VGP:	Vessel General Permit (EPA)

## INTRODUCTION

This report is prepared annually by the Alaska Department of Environmental Conservation (ADEC, or the Department) Division of Water (DOW), Commercial Passenger Vessel Environmental Compliance Program (CPVEC or the Program). The intent of this report is to provide information on the Program's monitoring and compliance efforts with cruise ship pollution and the status of the Ocean Ranger program.

## OCEAN RANGER PROGRAM SUMMARY

**Objective 1:** Ensure that Ocean Rangers are on board as many ships as possible to verify compliance.

**Authority.** AS 46.03.476 establishes the Ocean Ranger Program. The statute requires that all large commercial passenger vessels (LCPV) entering the marine waters of the state have an Ocean Ranger on board to act as an independent observer for the purpose of monitoring compliance with state and federal requirements.

**Implementation.** Ocean Rangers inspect enforceable conditions of state and federal requirements in an observer role only. Reports from Ocean Rangers are made from checklists and visual inspection of all areas onboard a cruise ship in Alaska waters during voyages and while in port. Reportable days are when a ship is in Alaska waters for at least three hours in a day. The contract for Ocean Rangers is with Crowley Maritime Corporation.

Deployment Types. The deployment schedule contained three types of deployments. Ocean Rangers:

- A. boarded cruise ships in Seattle or Vancouver and rode the cruise ship for the entire round trip voyage,
- B. boarded in Alaska and departed in Alaska on a partial voyage, or
- C. conducted in-port inspections.

**Results.** In 2018, Ocean Rangers completed 1580 Daily Reports, which is decrease of 1 from 2017 due to an unexpected change in a scheduled arrival of a cruise ship. Coverage rate for Ocean Rangers decreased 0.6% from 2017 to 2018. The decrease was due to more ships and more voyages, even while the number of report days remained almost the same. Ocean Rangers submitted 71 additional information project reports, 24 once a season reports, 56 oil spill or sheen reports, and 165 other reports.

### Products

Daily Reports:	1580 Daily Reports completed
Coverage Rate:	Ocean Rangers were aboard ships 66 % of the days ships were in Alaska waters

**Objective 2:** Improve compliance to protect public health and the environment through actions taken to correct compliance concerns reported by Ocean Rangers. Actions can be taken by ADEC or the appropriate referral agency. Reduce the annual infractions identified aboard cruise ships by the Ocean Rangers.

**Authority.** AS 46.03.476(a) authorizes Ocean Rangers to ensure that passengers, crew, and residents at ports are protected from improper sanitation, health, and safety practices.

**Results.** Ocean Rangers reported 189 alleged noncompliance incidents, an increase from 184 incidents in 2017. Table 1 provides a detailed breakdown of all alleged noncompliant incidents.

In addition to the above compliance categories in Table 1, the following additional observations or concerns were noted during the 2018 season:

- Fleet wide exhaust gas cleaning system (EGCS) installation and operation

- Air emissions observations noted upsets, blue smoke and steam, some may have been due to operations with new exhaust gas cleaning systems.
- Ocean Ranger access restrictions, impeding completion of their job duties as agents of the State of Alaska
- Record keeping practices

**Compliance.** When Ocean Rangers reported potentially noncompliant incidents, in all cases, the CPVEC Program immediately reported the condition to the cruise ship owner or operator. Standard procedure requires Ocean Rangers to inform a cruise ship’s crew of potentially noncompliant conditions. In the case of an actual noncompliant condition, CPVEC staff worked with the owner or operator to stop or correct the condition.

The CPVEC Program also provides notification to other responsible state and federal agencies regarding potentially noncompliant conditions that fell outside of the jurisdiction of the Program. CPVEC staff reported alleged noncompliant conditions to:

- Safety: U.S. Coast Guard Sector Juneau
- Health and Sanitation: U.S. Centers for Disease Control and Prevention, and the appropriate State of Alaska and local health agencies
- Vessel General Permit (VGP). U.S. Environmental Protection Agency (EPA)
- Oil Pollution Reporting: Because of the time-critical nature of oil pollution cases, Ocean Rangers submitted Oil Reports directly to ADEC’s Division of Spill Prevention and Response and copied the Program and other relevant parties as needed
- Other Federal Agencies with jurisdiction such as National Park Service and US Forest Service

**Objective 3:** Maximize the number of qualified Alaskans hired as Ocean Rangers.

**Authority.** AS 39.25.150(5) authorizes preferential hiring for local applicants when appropriate.

**Results.** The number of Alaskan Ocean Ranger hires were the same as 2017.

Alaskan Ocean Rangers:	5 of 22, or 22.7% of deployed Ocean Rangers were Alaskan residents in 2018
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**TRAINING.** Because marine engineers work on a wide variety of vessel types and sizes, it is unlikely that each trainee would have developed expertise or maintained currency in every Ocean Ranger monitoring category. Additionally, Ocean Rangers must learn state and contractor requirements.

- (1) Training Development and Refinement. The Cruise Ship Program, CMS, and the American Maritime Officer’s Union (AMO) cooperatively developed, refined, and delivered an Ocean Ranger training course.
- (2) Training Delivered in 2018. CMS conducted an Ocean Ranger training course at the AMO Simulation, Training, Assessment & Research (STAR) Center in Dania Beach, Florida.
- (3) On-the-job Training and Evaluations. In 2018, CMS continued on-the-job training and evaluation of Ocean Rangers in Alaska. The CMS program manager and an experienced Ocean Ranger conducted the training and evaluations while in port. This provided a valuable opportunity for Ocean Rangers, particularly new Ocean Rangers.

## **OCEAN RANGER, ADDITIONAL OBSERVATIONS SUMMARY**

**Authority.** AS 46.03.476(a) authorizes Ocean Rangers to ensure that passengers, crew, and residents at ports are protected from improper sanitation, health, and safety practices. AS 46.03.476 (b) authorizes Ocean Rangers to monitor and record information on engineering, sanitation, and health related operations of the vessel.

### **2018 Project Objectives:**

1. Exhaust gas cleaning system (EGCS) installation or operation
2. Combustion source inventory
3. Ballast water management
4. Food waste disposal practices

### **Objective 1:** Exhaust gas cleaning system installation or operation

**Authority.** AS 46.03.465(h), AS 46.03.482, and AS 46.03.488, the CPVEC Program continues study on EGCSs and their potential effect on environment of Alaska.

**Results.** The CPVEC Program monitors pollution from large commercial passenger vessels, or cruise ships. The US EPA and the International Maritime Organization (IMO) establish rules and regulations regarding fuel use and sulfur oxides (SO<sub>x</sub>) emissions globally; with lower limits established within designated Emission Control Areas (ECAs). State of Alaska waters east of the Kodiak area are part of the North American ECA.

Exhaust gas cleaning systems, or EGCSs, while designed to reduce SO<sub>x</sub> from the exhaust entering ambient air, can deposit these and various other pollutants into the ambient water through waste effluent generated by the scrubbing process. Some of these wastes may be held or offloaded in port. Scrubber wash water is typically regulated by the IMO and the US EPA for pH, PAH, and turbidity with other pollutants potentially affecting Alaska water quality standards.

Through information requests and daily Ocean Ranger observations, the CPVEC Program has summarized installation status and operation of EGCSs during the 2018 cruise ship season (Table 2).

Since January 1, 2015 cruise ships operating within ECAs have been required to comply with more stringent limits on SO<sub>x</sub> emissions. In 2018, 32 registered vessels used the following strategies to comply with the SECA (low sulfur emissions) requirement:

- 10 vessels exclusively used low sulfur marine gas oil (MGO; distillate fuel) to meet SO<sub>x</sub> limits.
- 22 vessels used higher sulfur residual fuel/heavy fuel oil (HGO) in combination with EGCSs:
  - 15 open loop EGCSs and
  - 7 hybrid EGCSs (capable of operating in either open- or closed-loop mode).

Of the 32 registered vessels, 29 vessels were part of EGCS observations by Ocean Rangers. CPVEC and Ocean Rangers inspected several systems of each type in operation (closed loop as well as open loop systems that use seawater).

Based on observations made by Ocean Rangers, the program has identified the following areas of concern:

1. **Sulfur Emissions.** While the Program does not have direct jurisdiction over SO<sub>x</sub> emissions, we continue to monitor for vessel compliance methods to meet ECA limit requirements. EGCSs can remove much of the sulfur from exhaust gases when combustion higher sulfur fuels; however, this requires proper operation and monitoring to ensure compliance.

2. **Visible Emissions (Opacity):** The Program observed that some EGCS system at times emit heavy steam plumes mixed with other visible emissions. To an untrained observer this steam may be mistaken for smoke and CPVEC did received multiple public complaints regarding low hanging smoke. There were instances when the observed visible emissions outside of the steam plume exceeded the opacity standards.
3. **Sheens and discoloration.** Open loop EGCSs, discharge washwater into ambient water. This discharge stream is required to be monitored for PAH content by the EPA VGP. Alaska prohibits sheens or oily discharge. During 2018, Ocean Rangers observed potential sheens from EGCS wash water discharges in Alaska ports. Discoloration, foam, and potential solids of unknown source were also documented. Most observations occurred while ships were docked. CPVEC staff learned about EGCS discharge filtration systems added to some systems, although some of these units had short filter life or were not continually used.
4. **Acidic Discharge.** EGCS discharged wash water is acidic. Alaska Water Quality Standards and EPA VGP limit pH. The EPA VGP requires monitoring of EGCS discharged wash water for pH. Some ships reported non-compliant discharges to EPA in 2016 and 2017. One major cruise ship operator started a pH mixing zone sampling project after Ocean Rangers left for the season.
5. **Other Discharges.** EGCS discharged wash water can be hotter than ambient water temperatures and may be discolored. It is expected that high temperature discharge water from an EGCS will have minimal localized impacts.

This areas of interest were identified last year, and the CPVEC Program will continue to monitor EGCS use and discharges in Alaska Waters. There is no compliance component to EGCS monitoring at this time.

**Objective 2:** Combustion source inventory

**Results.** In an attempt to assess the current fleet of combustion sources operating aboard cruise ships in Alaska waters, Ocean Rangers attempted to complete an additional observation questionnaire first initiated in 2015. The purpose of this project was to help assess potential air emissions impacts from cruise ships. Data collected from this effort is still preliminary and will build on past information collected.

**Objective 3:** Ballast water management

**Results.** Ocean Rangers were tasked with completing a project on selected ships to look at ballast water handling and operations while in Alaska waters. This was a follow up on previous projects regarding ballast water. Twenty three additional observation projects were completed for thirty four large cruise ships. While most large cruise ships do not discharge ballast water in Alaska, the CPVEC program recognized that many ballast water systems share tanks and equipment with wastewater treatment systems. Ballast water operations, covered under the EPA Vessel General Permit, also have the potential for the introduction of invasive species. This project will continue to document systems onboard and note changed to ballast water management plans.

**Objective 4:** Food waste disposal practices

**Results.** Ocean Rangers completed a project to gather information on the onboard handling and disposal of food wastes. Continued from 2017, this project will continue to inform the Department on how food waste is handled onboard large cruise ships and how liquid wastes relate to other wastewaters.

**Objective 5: Seawater Intake Project (New in 2018)**

**Results.** Ocean Rangers completed a project to gather information on seawater intakes. Information gathered included water intake location, marine growth control systems employed, and methods for cleaning

intake strainers, including how debris is handled (e.g incinerated or offloaded). All 32 vessels had some observations relating to oil to sea interfaces.

**Objective 6: Oil to Sea Interface Project (New in 2018)**

**Results.** Ocean Rangers completed a project to gather information on vessel systems with an oil sea interface. Propulsion systems, thrusters, stabilizers, and rudder systems where there is the potential to lose lubricant to the marine environment. The use of Environmentally Acceptable Lubricants (EALs) is preferred, but not possible due to operational/system limitations. Questions also included methods to monitor and recordkeeping of oil consumption. All 32 vessels had some observations relating to oil to sea interfaces.

**TABLES**

**Table 1: Ocean Ranger Alleged Noncompliant Incidents Reported (2018)**

<b>Alleged Noncompliant Condition</b>	<b>Number of Incidents Reported</b>
Oil Pollution	40
Safety	11
Sanitation	6
Wastewater	56
Other Waste	23
Air Pollution	10
EPA VGP Items	32
Access	11
<b>Total</b>	<b>189</b>

Table 2: 2018 Vessel Emissions Unit and EGCS Details

Line	Vessel	EGCS: EU	EU Inventory <b>EGCS EU</b>						EGCS	Port Fuel
			DG1	DG2	DG3	DG4	DG5	DG6		
CCL	Carnival Legend	3:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO/ MGO
CCL	Carnival Splendor	No Ocean Ranger data on sources or EGCS								MGO
CEL	Infinity	1:3	DG1	GT1	GT2				Closed Loop Hybrid	HFO/ MGO
CEL	Millennium	1:3	DG1	GT1	GT2				Closed Loop Hybrid- Not operated 2018 in Alaska	MGO
CEL	Solstice	2:4	DG1	DG2	DG3	DG4			Closed Loop Hybrid	MGO
CRY	Symphony	0:6	DG1	DG2	DG3	DG4	DG5	DG6	None	MGO
DIS	Disney Wonder	0:5	DG1	DG2	DG3	DG4	DG5		None	MGO
HAL	Amsterdam	3:5	DG1	DG2	DG3	DG4	DG5		Open Loop	HFO
HAL	Eurodam	4:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
HAL	Nieuw Amsterdam	4:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	MGO
HAL	Noordam	3:6	DG1	DG2	DG3	DG4	DG5	GT1	Open Loop	HFO
HAL	Volendam	3:5	DG1	DG2	DG3	DG4	DG5		Open Loop	HFO
HAL	Westerdam	4:6	DG1	DG2	DG3	DG4	DG5	GT1		HFO
HAL	Zaandam	3:5	DG1	DG2	DG3	DG4	DG5		Open Loop	HFO
NCL	Norwegian Bliss	5:5	DG1	DG2	DG3	DG4	DG5		Closed Loop Hybrid	HFO
NCL	Norwegian Pearl	5:5	DG1	DG2	DG3	DG4	DG5		Closed Loop Hybrid	HFO
NCL	Norwegian Jewel	5:5	DG1	DG2	DG3	DG4	DG5		Closed Loop Hybrid	HFO
Oceania	Regatta	0:4	DG1	DG2	DG3	DG4			None	MGO
PCL	Coral Princess	3:4	DG1	DG2	DG3	GT1			Open Loop	HFO
PCL	Emerald Princess	2:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
PCL	Golden Princess	2:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
PCL	Grand Princess	4:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
PCL	Island Princess	3:4	DG1	DG2	DG3	GT1			Open Loop	HFO
PCL	Ruby Princess	2:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
PCL	Star Princess	4:6	DG1	DG2	DG3	DG4	DG5	DG6	Open Loop	HFO
RCI	Explorer of the Seas	4:6	DG1	DG2	DG3	DG4	DG5	DG6	Closed Loop Hybrid- Not operated 2018 in Alaska	MGO
RCI	Radiance of the Seas	1:3	DG1	GT1	GT2				Closed Loop Hybrid	HFO
SEA	Seabourn Sojourn	0:4	DG1	DG2	DG3	DG4			None	MGO
SVN	Seven Seas Mariner	0:4	DG1	DG2	DG3	DG4			None	MGO
SIC	Silver Shadow	0:5	DG1	DG2	DG3	DG4	DG5		None	MGO