2018 Cruise Ship Air Compliance Report

Commercial Passenger Vessel
Environmental Compliance Program

NCL Norwegian Pearl, NCL Norwegian Bliss, and the PCL Star Princess docked in Skagway 6/13/2018

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INTRODUCTION

This report is prepared annually by the Alaska Department of Environmental Conservations (ADEC, or the Department) Division of Water 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 air pollution.

PCL Coral Princess, HAL Volendam, and the NCL Norwegian Bliss docked in Ketchikan 6/4/2018

AIR QUALITY SUMMARY

Objective: Maintain an effective environmental compliance program that engages in the direct monitoring of the opacity of air emissions from commercial passenger vessels to ensure the prevention of air pollution and the protection of public health.

Authority. AS 46.03.488. 18 AAC 50.070 establishes marine vessel visible emission standards.

Implementation. The regulation is applied to visible emissions, excluding water vapor, of marine vessels within three miles of the Alaska coastline. The CPVEC program uses EPA Reference Method 9 readings to provide the source of data for determining compliance with marine vessel visible emission standards. This method has been approved by the US Environmental Protection Agency (EPA) as part of the Federally Enforceable Air Quality Control State Implementation Plan under 40 CFR §52.70(28)(i). The CPVEC program monitors environmental compliance, as well as the direct and indirect environmental effects of commercial passenger vessels.

Results. Summaries of opacity results are available in Tables 1 to 5.

Readings:	480 opacity readings performed (EPA Method 9)
Compliance:	9 Notices of Violation Issued
Enforcement:	8 Notices of Violation Settlements pending, 1 Notice of Violation settled

In addition to monitoring for opacity and initiating enforcement actions for noncompliance, the Program is actively monitoring and studying the following significant points of interest to monitor for direct or indirect environmental effects, as required under AS 46.03.488:

- EGCSs: Commissioning and operation of exhaust gas control systems (EGCSs) on select vessels with additional wastewater discharge into marine waters of the state.
- Fuels: change in fuel use on those ships operating EGCS units, and on ships without EGCS to comply with more stringent sulfur emissions standards in the North American Emissions Control Area (since 2012).

Enforcement.

1. Norwegian Cruise Line Holding Ltd. (NCL) Compliance Order by Consent (COBC) – Effective December 11, 2015. NCL is the operator of the marine vessels *Norwegian Jewel, Norwegian Pearl,* and *Norwegian Sun*. **Details:** NCL entered into a COBC settlement agreement December 2015 based on seventeen (17) counts of noncompliance by exceeding the visible emission standards while operating in Alaskan waters spanning the 2012-2014 seasons. The COBC requires NCL to fully and timely comply with and/or complete remedial measures and corrective actions as required by the Order. **Stipulated Penalties:** For each vessel owned, operated, or chartered by NCL, a penalty of $37,500 for each non-compliance event under 18 AAC 50.070 that occurs while this Order is effective and that is listed in an ADEC Notice of Violation (NOV).

   2018 Action: NOV issued September 7, 2018 on the Norwegian Jewel for July 11, 2018 non-compliance in Ketchikan. Demand Letter of Stipulated Penalties issued October 5, 2018. Stipulated penalties of $37,500 paid by NCL.

2. Royal Caribbean Cruises Ltd. (Respondent) Compliance Order by Consent (COBC) – Effective February 3, 2017. The Respondent is the owner of the cruise line brands Royal Caribbean International (RCL), operator of the marine vessels *Radiance of the Seas* and *Rhapsody if the Seas* and Celebrity Cruises (Celebrity), operator of the marine vessels *Celebrity Century* and *Celebrity Millennium*.

Details: The Respondent entered into a COBC settlement Agreement February 2017 based on eight (8) counts of noncompliance by exceeding the visible emission standards while operating in Alaskan waters spanning the 2010, 2013, and 2014 seasons. The COBC requires the Respondent to fully and timely perform, comply with and/or complete remedial measures and corrective actions as required by the Order. **Stipulated Penalties:** For each vessel owned, operated, or chartered, a penalty of $37,500 for each non-complaint event under 18 AAC 50.070 that occurs while the Order is effective and that is listed in an ADEC Notice of Violation.

2018 Action: Two (2) NOVs issued September 7, 2018 on the Radiance of the Seas for August 8, 2018 non-compliance in Ketchikan and on the Radiance of the Seas for August 17, 2018 non-compliance in Seward. Demand Letter for Stipulated Penalties issued October 5, 2018. Settlement pending.

3. Holland American Line (HAL) Settlement Agreement signed May 22, 2017. HAL signed a Settlement Agreement for years 2009-2014 alleged visible air emission violations. HAL chose to resolve the alleged violations by a Settlement Agreement versus a Compliance Order by Consent. The State of Alaska collected a total civil assessment of $180,000.

   2018 Action: Four (4) NOVs issued September 7, 2018 on the Nieuw Amsterdam for June 19, 2018 non-compliance in Skagway, on the Westerdam for June 20, 2018 non-compliance in Haines, on the Eurodam for August 2, 2018 non-compliance in Ketchikan, and on the Amsterdam for August 24, 2018 non-compliance in Ketchikan. Settlement Agreement to HAL "Year 2018 Visible Air Emissions" issued October 17, 2018. Settlement pending.

4. Princess Cruise Line, Ltd. (PCL) Settlement Agreement signed May 22, 2017. PCL signed a Settlement Agreement for years 2009-2014 alleged visible air emission violations. PCL chose to resolve the alleged violations by a Settlement Agreement versus a Compliance Order by Consent. The State of Alaska collected the total assessment of $110,125.

   2018 Action: Two (2) NOVs issued September 7, 2018 on the Emerald Princess for July 31, 2018 non-compliance in Ketchikan and on the Golden Princess for July 31, 2018 non-compliance in Juneau. Settlement Agreement to PCL "Year 2018 Visible Air Emissions" issued October 17, 2018. Settlement pending.

Compliance and Monitoring. Compliance with opacity requirements is determined through use of EPA Reference Method 9 observations. Observations are made by trained staff and contracted opacity readers. The current contractor for opacity readings is FLAT LAKE Engineering LLC, based in Ketchikan, AK with additional staff in Juneau, AK and Anchorage, AK. The US Forest Service (USFS) signed on to a Memorandum of Understanding (MOU) with CPVEC to monitor air emissions and wastewater discharges from marine vessels. The latest MOU was executed May 21, 2018 and is effective through April 30, 2023. The USFS submits Method 9 observations made while vessels are underway in Tracy Arm.

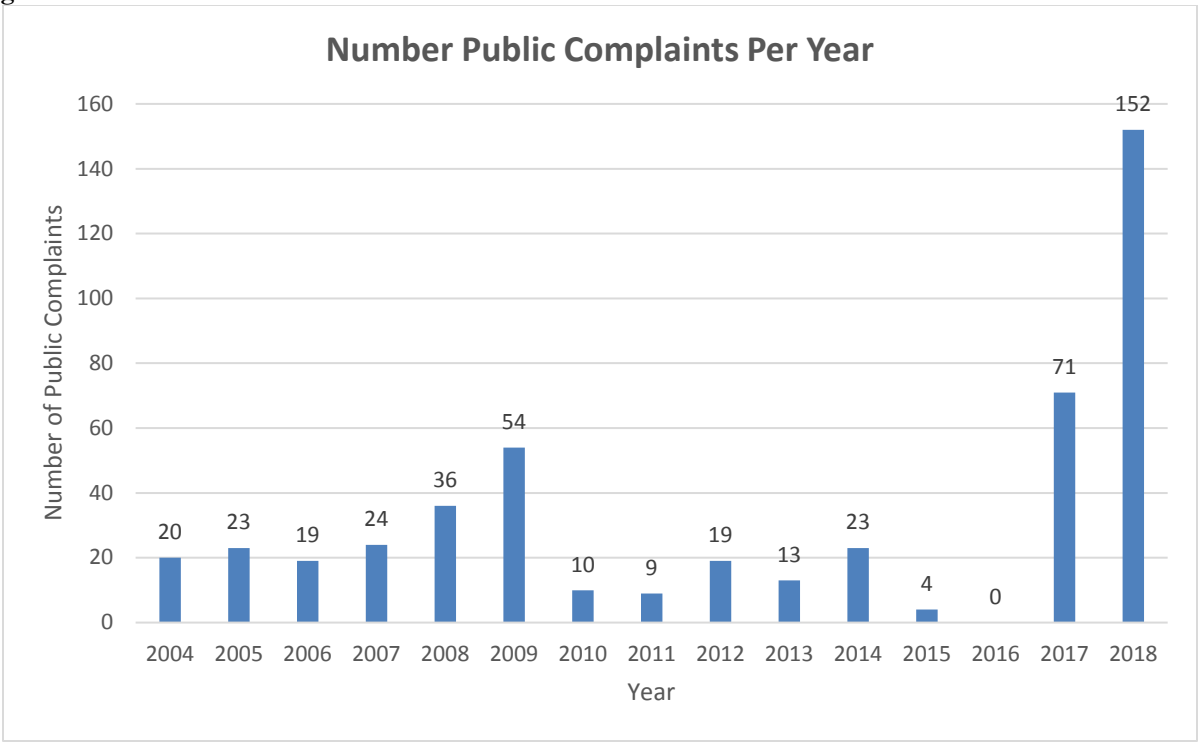
The Program goal in monitoring opacity is to conduct consistent opacity readings primarily within Alaska's three busiest cruise ship ports: Juneau, Ketchikan, and Skagway. Both staff and the contractor will travel to other ports during the season to conduct readings. Reasonable efforts will be made to conduct opacity readings of small cruise ships and state ferries. Summary data for reading counts are found on Tables 1 to 5.

Public Complaints. The Department responds to public complaints regarding cruise ship pollution. Although complaints, photographs, or other evidence of emissions exceedances are sometimes not provided according to Reference Method 9 requirements, the Program will often follow up complaints with an opacity reading by Department staff or the contractor. In any case of a complaint, vessel operators or owners are

notified as soon as possible so that mitigating steps may be taken. The number of public complaints responded to by staff each year can be found in Figure 1.

In prior years, many complaints did not mention a particular vessel, but were concerning the overall air quality in Juneau when cruise ships were present. There has been a dramatic increase in complaints over the 2017 and 2018 seasons where more complainants are identifying vessels by their name. The increase in public complaints coincides with an increased in the number of ships operating Exhaust Gas Cleaning Systems (EGCSs or Scrubbers). Complaints show a weekly trend with certain vessels, reporting excess smoke, smell of exhaust and a blue haze settling over downtown Juneau. In addition, Public complaints in 2018 included general air quality, smell of exhaust, and excess emissions from ships. In 2017 and 2018, ADEC has also seen an increase in complaints from communities outside of Juneau. These communities include Ketchikan, Skagway, and Hoonah.

Figure 1



Ambient Air Monitoring. The Program is working with the Division of Air on an ambient air monitoring saturation study during the 2019 cruise ship season to measure levels of PM 2.5 in downtown Juneau. Ambient air was monitored in downtown Juneau for sulfur dioxide, nitrogen oxides, and PM 2.5 during 2000 and 2001. The pollutant levels in 2001 were below federal and state health standards. Since the 2000/2001 study, tourism in Juneau has grown and the number of cruise ships calling to Juneau's port has increased. In addition, many cruise ships have installed EGCSs to meet International Maritime Organization's (IMO) and ECA SOx regulations. The EGCSs allow cruise ships to operate on fuels with higher levels of sulfur than ECA limits by "scrubbing" exhaust gas with seawater or an alkali to reduce the SOx emissions exiting the stack; Because of these changes, there is an increased interest in how it has effected PM 2.5 levels.

TABLES

Table 1: 2018 Contractor Opacity Readings

Location	Readings
Juneau	202
Ketchikan	188
Skagway	16
Haines	1
Hoonah	0
Sitka	9
Seward	3
Anchorage	2
Total Opacity Readings	**421**

Table 2: 2018 ADEC Staff Opacity Readings

Location	Readings
Juneau	31
Ketchikan	8
Skagway	10
Haines	1
Hoonah	2
Sitka	7
Seward	0
Anchorage	0
Total Opacity Readings	**59**

Table 3: Opacity Readings Per Year Summary

Year	2014	2015	2016	2017	2018
Number of Readings	382	343	388	552	480

Table 4: Opacity Violations Issued (2018)

Vessel	Date	Port	Status
HAL Nieuw Amsterdam	6/19/2018	Skagway	Pending
HAL Westerdam	6/20/2018	Haines	Pending
NCL Norwegian Jewel	7/11/2018	Ketchikan	Settled
PCL Emerald Princess	7/31/2018	Ketchikan	Pending
PCL Golden Princess	7/31/2018	Juneau	Pending
HAL Eurodam	8/2/2018	Ketchikan	Pending
RCL Radiance of the Seas	8/8/2018	Ketchikan	Pending
RCL Radiance of the Seas	8/17/2018	Seward	Pending
HAL Amsterdam	8/24/2018	Ketchikan	Pending

-Pending indicates a case is currently under negotiation
-Settled indicates an enforcement settlement has been reached
-Resolved indicates a case has been closed without formal enforcement

Table 5: Opacity Reading Count by Port (2018)

Port	Readings
Juneau, AK	233
Ketchikan, AK	196
Skagway, AK	26
Haines, AK	2
Hoonah, AK	2
Sitka, AK	16
Seward, AK	3
Anchorage, AK	2

Table 6: Violations Per Year Summary

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Violations	10	3	7	4	2	5	25	0	0	2	9

Table 7: Vessel Emissions Units (EU) and EGCS Details

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

Note: ships using HFO may switch to MGO while in port or in areas such as Glacier Bay
DG is Diesel Generator, GT is gas turbine

Abbreviations and Acronyms

AAC:	Alaska Administrative Code
ADEC:	Alaska Department of Environmental Conservation
AS:	Alaska Statute
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
MGO:	Marine gas oil, a distillate fuel
MOU:	Memorandum of Understanding
PM:	Particulate Matter
SO_X:	Sulfur oxides
USFS:	United States Forest Service
UW:	Underway