CROWLEY
People Who Know

Consolidated Additional Observations

This questionnaire combines all standard Additional Observation Questions in one condensed questionnaire.
1. SOx Emissions Controls
2. Ballast Water Project
3. Combustion Source Project
4. Food Waste Project
5. Sea Intake Project

Findings can be reported in the spaces provided for each item; feel free to use additional space for notes and information. Sketches, diagrams, photos of handwritten notes, or copies of schematics are welcome.

Several questions are checks on previous Additional Observations, check these against the previous observations. If a ship is required to have an additional observation project on a section below, skip the section below. For example if a combustion source project is required leave the section in this project blank.

A: General Information

Report Start Date:	Jun 5, 2018
Ocean Ranger starting report:	philip.parent
Ship Name:	Crystal Symphony
Ship Code:	YSY
Is this a revision of a previous report (Y/N)?	No

1: SOx Emissions Controls

1.1 Describe the SECA compliance plan.	Ship uses low sulfur MGO when in SECA areas. Last MGO Bunkers in Vancouver was .0008%
1.1 Completed by:	Philip Parent (philip.parent)
1.2 How does the vessel control SOX emissions in the ECA? Provide description. If the vessel used low sulfur fuels in AK describe the fuel switches and which combustion sources are operated on low fuel sulfur, and when.	Ship only burns low sulfur MGO in Alaska waters and ports
1.2 Completed by:	Philip Parent (philip.parent)
1.3 Is the vessel operating or installing an exhaust gas scrubber system in the 2018 Alaska Cruise Season? If yes, complete section 1A. Otherwise skip to section 2.	No

1.a: SOx Emissions Controls

2: Ballast Water

2.1 Check the previous Additional Observation Reports (section 1.1) list of tanks used for Ballast Water storage. Including volumes and locations. List any changes.	Not completed per email instructions concerning previous reports
2.1 Completed by:	Philip Parent (philip.parent)
2.2 Are ballast water tanks used for wastewater storage?	Yes
2.2 Completed by:	Philip Parent (philip.parent)
2.3 Ballast Water system: brief description of the combined piping system if tanks used for both.	Common service line and two bilge Pumps used for Ballast Water Main and the Black and Gray Water tanks
2.3 Completed by:	Philip Parent (philip.parent)
2.4 Ballast Water treatment installation? If yes, describe operation/system specifics.	No BW treatment installed
2.4 Completed by:	Philip Parent (philip.parent)

2.5 Ballast Water operations in AK waters (overboard intake/discharge, etc.)? Include the last date of ballast water discharges. Typically in the ballast water logs.	Last Ballast Water operation: Ballast Tank 1 Date: 05/20/2018 Time: 11:56 Location: 28*32.3'N 130*27.4'W Volume: 200m3 Type: Deballast Depth: >4000 meters No ballasting or deballasting operations done in Alaska waters
2.5 Completed by:	Philip Parent (philip.parent)

3: Combustion Sources

3.1 Are there any changes from the previous Additional Observation projects (Section 2.1) on the propulsion system question on brief description of propulsion and power systems used on board (Diesel direct/reduction gears/PTO's DE, FP, CPP Azipod, etc.)?	The Crystal Symphony has six diesel engines which are Wartsila-Sulzer 9ZAL40S. The engines are single acting, four cycle trunk piston, turbocharged diesels. Each engine is connected to a brush less type three phase generator. Each engine has nine cylinders with an output of 6,480 KW at 514 rpm. The total electrical power of these six diesel generators is 38,880 KW. Approximately 23,300 KW is used for the propulsion motors. The propulsion system is diesel electric provided by two sets of ABB three phase synchronous and frequency controlled electric motors with AC 1,500 volts and a maximum output of 11,500 KW. Revolution is 0-130 rpm. The propulsion motors are directly coupled to shafts which have a Kamewa four bladed controllable pitch propellor, with a 205 inch diameter. There is one emergency diesel generator on Deck 6 aft. This engine is a 12 cylinder, four stroke radiator cooled CAT 12 Volt diesel which is connected to a brushless type three phase generator with an output of 850 KW at 1,800 rpm. The Crystal Symphony has two forward thrusters and one aft thruster. The thrusters have four bladed aluminum bronze controllable pitch propellors with an 87 inch diameter. The propellors are driven by constant speed electric motors through vertical gear shifts. The input shaft power for each motor is 1000KW. Ship's diesel generators have waste gates which are set to open at 90% of load and operate at 80% MCR.

3.1 Completed by:	Richard Ekstrom (richard.ekstrom)
3.2 Are there any changes from the previous Additional Observation projects (Section 1.1) on the list of the combustion equipment used for Power/Propulsion (make/model/output)?	The Crystal Symphony has six diesel engines listed below: Wartsila Sulzer 9ZAL40S Serial number: 716 9 cylinders. Shaft power: 6480 KW@514 rpm Wartsila Sulzer 9ZAL40S Serial number: 717 9 cylinders. Shaft power: 6480 KW@514 rpm Wartsila Sulzer 9ZAL40S Serial number: 718 9 cylinders. Shaft power: 6480 KW@514 rpm Wartsila Sulzer 9ZAL40S Serial number: 719 9 cylinders. Shaft power: 6480 KW@514 rpm Wartsila Sulzer 9ZAL40S Serial number: 720 9 cylinders. Shaft power: 6480 KW@514 rpm Wartsila Sulzer 9ZAL40S Serial number: 721 9 cylinders. Shaft power: 6480 KW@514 rpm Emergency DIesel Generator CAT 12V diesel is 12 cylinder, four stroke, radiator cooled connected to a three phase generator with an output of 850 KW at 1,800 rpm. The ship has two boilers: Type: Aquamaster-Rauma Ltd. Fuel oil: MGO cold start. Running: Heavy fuel oil Steam pressure: 9.0 bar The boilers are oil fired with a steam capacity of two tons per hour with a steam pressure of 131 psi.
3.2 Completed by:	Richard Ekstrom (richard.ekstrom)
3.3 Are there any changes from the previous Additional Observation projects (section 3) on the incinerators make, model, fuel used, capacity?	The incinerator is made by Evac Marine Services Incinerator type: NH 600SG-S 14047.1 Operating hours on the incinerator average 40 hours per week.

3.3 Completed by:	Richard Ekstrom (richard.ekstrom)
3.4 Average Hotel power (kW) in port and underway?	The load on the Crystal Symphony on June 7 at the dock in Juneau was 3.2 MW. Underway the expected hotel load may range from 3.5 to 4.0 MW
3.4 Completed by:	Richard Ekstrom (richard.ekstrom)
3.5 Average fuel consumption in port and underway?	At a cruising speed of 22 knots running five generators 40,000 gallons of fuel are consumed in 24 hours. At 21 knots running four diesels 34,000 gallons of fuel are consumed in 24 hours. At 18 knots running three diesels 29,000 gallons of fuel are consumed in 24 hours. In the port of Ketchikan on June 26 #5 DG was online and burning 794 L/hr. Of MGO
3.5 Completed by:	Richard Ekstrom (richard.ekstrom)

4: Food Waste Garbage Handling

4.1 How is food waste handled and disposed of?	Food waste is sent from the 10 galley sculleries onboard through two separate SOMAT wet pulper/dewatering units. The remaining solids are then fed into one of two wet food or two dry waste silos for incinerating or offloading to shoreside facilities. Water removed goes to the pulper economizer tank for recircing through the pulper units. Excess pulper economizer water will overflow from the economizer tank to a degreasing unit which will overflow to the GW Holding Tank and discharged outside 12 nautical miles. Large or non grindable food waste (bones, fish skins, banana peels, etc)is double bagged and offloaded to shoreside facilities.
4.1 Completed by:	Philip Parent (philip.parent)
4.2 Average food waste production per day (kgs/day)?	2m3 food waste production per day
4.2 Completed by:	Philip Parent (philip.parent)
4.3 Is the food waste de-watered? If yes, provide dewatering volumes and handling information.	Unknown volume goes to GW holding tanks
4.3 Completed by:	Philip Parent (philip.parent)
4.4 How are glass bottles, broken crockery, and ceramics handled?	Bagged and offloaded to shoreside facilities
4.4 Completed by:	Philip Parent (philip.parent)
4.5 How is food waste monitored and/or recorded?	Garage Record Book
4.5 Completed by:	Philip Parent (philip.parent)

5: Sea Water Intakes

5.1 List all of the seawater intakes (chests); include the locations, frame, side (PS/SB) or compartment.	There are two main sea chests onboard the Crystal Symphony. One is in the pump room (Fr. 102-105), and is for the main engine. The other sea chest is in the forward compressor room and is used for the a.c. compressor and reverse osmosis units.
5.1 Completed by:	Richard Ekstrom (richard.ekstrom)
5.2 List filtration systems for each intake. Describe how filter systems are maintained. What is the frequency of cleaning? Is this performed in Alaska?	Ship has sea chests screen strainers only. Strainers are cleaned as necessary (even in Alaska, if needed) and the debris/mud is removed, bagged, and offloaded to shoreside facilities
5.2 Completed by:	Mark Frechette (mark.frechette)

5.3 How is debris and mud from filtration/strainers handled?	Debris and mud is bagged and would be offloaded in Victoria or Vancouver, if strainers are cleaned in Alaska waters
5.3 Completed by:	Mark Frechette (mark.frechette)
5.4 Marine Growth Protection Systems in the sea intakes. Description of the control systems and information on checmicals if used.	Ship uses the Wilson-Walton "CLEARFLO" Anti-Fouling and Anti-Corrosion System
5.4 Completed by:	Mark Frechette (mark.frechette)
5.5 Hull cleaning in place in Alaska 2018?	No hull cleaning operations scheduled in Alaska
5.5 Completed by:	Mark Frechette (mark.frechette)

6: General

6.1 Is vessel crew cooperative on this project?	Yes. Team effort involved with Phil, Mark and myself. Engineers from the CE on down were willing to answer questions.
6.1 Completed by:	Richard Ekstrom (richard.ekstrom)
6.2 Do you feel the vessel has a clear understanding of compliance requirements?	The ship burns LSMGO exclusively while in the ECA relieving them of compliance requirements.
6.2 Completed by:	Richard Ekstrom (richard.ekstrom)
6.3 Are there other remarks/ comments the OR wants to share?	The Crystal will only be in Alaska for a short period of time.
6.2 Completed by:	mark.frechette philip.parent richard.ekstrom

Z: Signature & Submit

Ocean Rangers contributing to this report:	Philip Parent (philip.parent) Richard Ekstrom (richard.ekstrom) Mark Frechette (mark.frechette)
Ocean Ranger Signature: