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 18, 2018
Ocean Ranger starting report:	ronald.ladd
Ship Name:	Princess Grand
Ship Code:	PGR
Is this a revision of a previous report (Y/N)?	No

1: SOx Emissions Controls

1.1 Describe the SECA compliance plan.	The PGR achieves compliance by using regulatory MGO in DGs not fitted with an EGC system and using, presently, RMG 380 fuel (less than 2 % sulphur content) in DG's in conjunction with an associated EGC system. Boilers and the incinerator will always use regulatory MGO at all times inside or outside of the ECA.
1.1 Completed by:	Ronald Ladd (ronald.ladd)
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.	DG's 1, 2, 5 and 6 have EGC systems fitted and can also, if need be, be operated on regulatory MGO if so desired. This has not, as of yet, been necessary to do in AK this season nor is it anticipated that it should be. DG's 3 and 4 have no EGC system fitted and therefore operate on regulatory MGO only at all times in the ECA. The PGR very often operates on a DG, in conjunction with an associated EGC system when docked or may use one of the MGO only DG's, #3 or #4. Today, June 18, 2018, the PGR was anchored in KTN and was operating on two DG's in conjunction with the associated EGC systems and without issue. When in special areas, and in the 2018 Alaska season this would only be TA or END, regulatory MGO DG's will be in operation.
1.2 Completed by:	Ronald Ladd (ronald.ladd)
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.	Yes

1.a: SOx Emissions Controls

1.4 Which combustion sources are coupled with the EGCS system?	DGs 1, 2, 5, and 6.
1.4 Completed by:	Jonathan Driggers (jonathan.driggers)
1.5 EGCS units make, number, model, locations, fuel limitations (sulfur %).	EcoSpray Open-Loop Seawater DeSOx Absorption System, ECO-DeSOx;
1.5 Completed by:	Jonathan Driggers (jonathan.driggers)
1.6 Scrubber type (closed, reagent cycle, combination or hybrid open-loop effluent to seawater)?	Open Loop (Seawater to Seawater)
1.6 Completed by:	Jonathan Driggers (jonathan.driggers)
1.7 System status (operational, commissioning, under construction)?	Operational, being ran underway and in port.
1.7 Completed by:	Jonathan Driggers (jonathan.driggers)
1.8 Provide a process description and waste flow/chemicals used (Gaseous emissions, waste effluent, ash, spent reagents, etc.).	The DeSOx Tower is a Wet Open-loop Type Absorbing System that utilizes the natural alkilinity contained in seawater to turn SOx into neutral carbonate salts. The absorption process takes place inside the DeSOx Tower which has been installed in place of the silencer. Seawater is continuously supplied to the DeSOx Tower by the variable speed SW Pumps. When the system is in standard automatic control mode the Automation System automatically sets the required seawater flow rate based on the DG load and calculated SO2/CO2 ratio. Values for SO2 and CO2 are taken from the Exhaust Gas Analyzer readings. For each installation, a Minimum and Maximum flow rate value is set during commissioning of the EGC system. This Automation System not only maintains the SO2/CO2 ratio as required at all engine loads (including transient loads), but also maintains both the PH and PAH values within the required IMO Marpol limits. The DeSOx Towers are fitted with nozzle banks which spray seawater into the exhaust gas stream. A static Demister is fitted at the top of each DeSOx Tower to remove water droplets and mist to avoid carry-over. The water removed by the Demister is drained back to the main body of the Towers by gravity. No chemicals are used in the system.
1.8 Completed by:	Jonathan Driggers (jonathan.driggers)
1.9 What scrubber process parameters are monitored (flow capacities, pH, other)?	Flow rate, turbidity, temperature, PAH, and pH.
1.9 Completed by:	Jonathan Driggers (jonathan.driggers)
1.10 For seawater intake/effluent, please provide port locations (PS/STB Frame number, etc.). Additional notes can include distance below waterline and angles.	DG1- Intake: Starboard side, Frames 45-48; Effluent: Starboard Aft Incinerator Room, Frame 47; DG2- Intake: Starboard side, Frames 45-48; Effluent: Starboard Aft Incinerator Room, Frame 47; DG5- Intake: Starboard side, Frames 45-48; Effluent: Starboard Aft Incinerator Room, Frame 45; DG6- Intake: Starboard side, Frames 45-48; Effluent: Starboard Aft Incinerator Room, Frame 45;
1.10 Completed by:	Jonathan Driggers (jonathan.driggers)

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.

Ballast DB 1 C - Capacity 331.8 m3 - primary use is sea water ballast.
Ballast DB 2 C - Capacity 85.2 m3 - primary use is sea water ballast.
Ballast DB 3 P - Capacity 105.7 m3 - primary use is AWPS Treated WW - secondary use is Untreated GW.
Ballast DB 4 S - Capacity 105.7 m3 - primary use is AWPS Treated WW - secondary use is Untreated GW.
Ballast DB 5 P - Capacity 109.4 m3 - primary use is AWPS Treated WW - secondary use is Untreated GW.
Ballast DB 6 S - Capacity 109.4 m3 - primary use is Untreated GW - secondary use is AWPS Treated WW (Black only, gray only and gray & black mixed).
Ballast DB 7 P - Capacity 166.9 m3 - primary use is Untreated GW - secondary use is AWPS Treated WW (Black only, gray only and gray & black mixed).
Ballast DB 8 S - Capacity 166.9 m3 - primary use is Untreated GW - secondary use is AWPS Treated WW (Black only, gray only and gray & black mixed).
Ballast DB 9 P - Capacity 127 m3 - primary use is Untreated gray water.
Ballast DB 10 P - Capacity 256.3 m3 - primary use is Untreated gray water.
Ballast DB 11 S - Capacity 256.3 m3 - primary use is Untreated gray water.
Ballast DB 12 S - Capacity 127 m3 - primary use is Untreated gray water.
Ballast DB 13 P - Capacity 94.1 m3 - primary use is sea water ballast - secondary use is Untreated gray water / Used for GW during the AK season only.
Ballast DB 14 P - Capacity 177.5 m3 - primary use is sea water ballast - secondary use is Untreated gray water / Used for GW during the AK season only.
Ballast DB 15 S - Capacity 177.5 m3 - primary use is sea water ballast - secondary use is Untreated gray water / Used for GW during the AK season only.
Ballast DB 16 S - Capacity 94.1 m3 - primary use is sea water ballast - secondary use is Untreated gray water / Used for GW during the AK season only.
Ballast DB 17 P - Capacity 188.1 m3 - primary use is sea water ballast.
Ballast DB 18 S - Capacity 188.1 m3 - primary use is sea water ballast.
Ballast DB 20 P - Capacity 51.1 m3 - primary use is sea water ballast.
Ballast DB 21 S - Capacity 51.1 m3 - primary use is sea water ballast.
Ballast DB 22 S - Capacity 32 m3 - primary use is sea water ballast.
Ballast DB 23 P - Capacity 92.6 m3 - primary use is sea water ballast.
Ballast DB 24 S - Capacity 92.6 m3 - primary use is sea water ballast.
Ballast DB 25 P - Capacity 32 m3 - primary use is sea water ballast.
Ballast DB 26 P - Capacity 212.8 m3 - primary use is sea water ballast.
Ballast DB 27 S - Capacity 207.8 m3 - primary use is sea water ballast.
Ballast DB 28 C - Capacity 156.8 m3 - primary use is sea water ballast.

	Ballast DB 29 C- Capacity 78.9 m3 - primary use is sea water ballast. Fore Peak Ballast Tank - Capacity 749.1 m3 - Ballasted with Fresh Water.
2.1 Completed by:	Ronald Ladd (ronald.ladd)
2.2 Are ballast water tanks used for wastewater storage?	Yes.
2.2 Completed by:	Ronald Ladd (ronald.ladd)
2.3 Ballast Water system: brief description of the combined piping system if tanks used for both.	The Ballasting system is a "common line system" and the manifold is arranged for common suction and discharge. The operational line up will depend on what is needed to be accomplished. There are two "blank flanges" or referred to on the line diagrams of the ballast system as "blind flanges" which separate the ballast water from the WW water system. These two "blind flanges" receive a monthly "seal check" by the EO.
2.3 Completed by:	Jonathan Driggers (jonathan.driggers)
2.4 Ballast Water treatment installation? If yes, describe operation/system specifics.	Yes, a Hyde Guardian HG 250. It's purpose is to prevent the spread of water borne invasive species. Ballast water is treated with the BWTS as it enters and leaves the ships ballasting system. First, seawater is passed through a filtration system that has a powerful disinfecting unit. The filter train removes sediment and large organisms. UV lighting deactivates or damages the DNA of organisms, either killing them or making them sterile. Deballasted water undergoes UV treatment before being discharged.
2.4 Completed by:	Ronald Ladd (ronald.ladd)
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.	No ballast operations will take place in AK waters. The last ballasting operation was performed on 15 June 2018 while alongside in SFO. Tank 18 S had a content of 184 m3 and a final content of 9.4 m3. The operation took 1 hour and 10 minutes using the BWTS.
2.5 Completed by:	Ronald Ladd (ronald.ladd)

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.)?	No changes from 2017 report.
3.1 Completed by:	Jonathan Driggers (jonathan.driggers)
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)?	No changes from 2017 report.
3.2 Completed by:	Jonathan Driggers (jonathan.driggers)
3.3 Are there any changes from the previous Additional Observation projects (section 3) on the incinerators make, model, fuel used, capacity?	No changes from 2017 report.
3.3 Completed by:	Jonathan Driggers (jonathan.driggers)
3.4 Average Hotel power (kW) in port and underway?	Average hotel power for underway and in port is 8,000-9,000 kW. Information from First Engineer.
3.4 Completed by:	Jonathan Driggers (jonathan.driggers)

3.5 Average fuel consumption in port and underway?	Average fuel consumption in port is about 1.7 MT of HFO, and 0.3 MT of MGO. Average fuel consumption underway is dependent on speed need of vessel, and how many engines are online, about 1.9 MT per engine. These averages are daily. Information from First Engineer.
3.5 Completed by:	Jonathan Driggers (jonathan.driggers)

4: Food Waste Garbage Handling

4.1 How is food waste handled and disposed of?	Food waste is stored in big totes and refrigerated for offload in Canada they have it down to a science of how many totes they will need and how many cubes they hold there are 17 totes that hold a cube.
4.1 Completed by:	Thomas Cook (thomas.cook)
4.2 Average food waste production per day (kgs/day)?	2 to 3 cubes per day on food waste for storage in walk-in cooler to be offload in Canada.
4.2 Completed by:	Thomas Cook (thomas.cook)
4.3 Is the food waste de-watered? If yes, provide dewatering volumes and handling information.	No some of it is prepared to be pumped overboard once they are outside of Alaskan waters.
4.3 Completed by:	Thomas Cook (thomas.cook)
4.4 How are glass bottles, broken crockery, and ceramics handled?	They're run through a crusher and put into large ash bags or boxes for offload in Canada.
4.4 Completed by:	Thomas Cook (thomas.cook)
4.5 How is food waste monitored and/or recorded?	The totes that used will hold so much in cubic meters and that gives them a idea on how much they have in cubes one tote equal 1 cube so there are 17 totes.
4.5 Completed by:	Thomas Cook (thomas.cook)

5: Sea Water Intakes

5.1 List all of the seawater intakes (chests); include the locations, frame, side (PS/SB) or compartment.	Frame 108-112 auxiliary room frame 196-200 potable water room frame 56-60 EGCS Intake frame 64-68 Aft Crossover.
5.1 Completed by:	Thomas Cook (thomas.cook)
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?	As required or one month or when needed and wherever needed some of the filters are important to ship's operation.
5.2 Completed by:	Thomas Cook (thomas.cook)
5.3 How is debris and mud from filtration/strainers handled?	Off load as garbage in Canada some filters like scrubber filters are treated as hazardous material.
5.3 Completed by:	Thomas Cook (thomas.cook)
5.4 Marine Growth Protection Systems in the sea intakes. Description of the control systems and information on checmicals if used.	No protection is used for Marine growth in the intake strainers.
5.4 Completed by:	Thomas Cook (thomas.cook)
5.5 Hull cleaning in place in Alaska 2018?	Cleaning is done before coming into Alaska no hull cleaning in Alaska waters.
5.5 Completed by:	Thomas Cook (thomas.cook)

6: General

6.1 Is vessel crew cooperative on this project?	Very helpful had help from engineering and EO.
6.1 Completed by:	Thomas Cook (thomas.cook)

6.2 Do you feel the vessel has a clear understanding of compliance requirements?	Yes, I think they have full understanding of the rules and environmental impact.
6.2 Completed by:	Thomas Cook (thomas.cook)
6.3 Are there other remarks/ comments the OR wants to share?	The EO is a very nice helpful young guy with a great attitude.
6.2 Completed by:	thomas.cook

Z: Signature & Submit

Ocean Rangers contributing to this report:

Alan Ladd
Thomas Cook (thomas.cook)
Jonathan Driggers (jonathan.driggers)

Ocean Ranger Signature: