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 11, 2018
Ocean Ranger starting report:	robert.layko
Ship Name:	Holland Eurodam
Ship Code:	HER
Is this a revision of a previous report (Y/N)?	No

1: SOx Emissions Controls

1.1 Describe the SECA compliance plan.	Ship is using Exhaust Gas Scrubber systems on 4 Diesel Generators while in and out of Alaska waters. They are using low sulfur MGO while in Glacier Bay and other special areas.
1.1 Completed by:	Robert Layko (robert.layko)
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 is fitted with 4 exhaust gas scrubber systems. These are being used while inside and outside of Alaska waters. Two DGs. #1 and #2 are being used in port with "Alfa" filters used. This is a automatic back flush filter with 50 micron elements While underway the ship switches to 2 (bag or sock type) filters. When going into special areas (Glacier Bay) a two hr notice is given from Bridge. Engineers line up Low Sulfur MGO on DGs that are going to be used and the fuel switch is made one hr before arrival. When exiting Glacier Bay one hr after departure the Scrubber systems are started on DGs to be used and fuel is then switched back to HFO with Scrubber systems in full operation.
1.2 Completed by:	Robert Layko (robert.layko)
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?	Diesel Generators 1, 2, 5, and 6 all have Scrubber systems installed.
1.4 Completed by:	Robert Layko (robert.layko)
1.5 EGCS units make, number, model, locations, fuel limitations (sulfur %).	DG #1 Wartsila 16ZA40S MCR: 11,520 kW DG serial # 12342 EGC Tower no: 13-036-

	APC. DG-1 DG #2 Wartsilla 12ZA40S MCR: 8,640 kW DG serial # 12346 EGC Tower no: 13-036-APC DG-2 DG #4 Wartsilla 16ZA40S MCR: 11,520 kW DG serial # 12343 EGC Tower no: 13-036-APC DG #4 DG #5 Wartsilla 12ZA4OS MCR: 8,640 kW DG serial # 12345 EGC Tower no: 16-286-APC SC-500 All Scrubber units are ECO- DeSOx (Models) Unit. Manufactures. Model Type. Serial Number. Compartment DG #1. MAK. 12M43C. 69009. Engine Room Aft DG #2. MAK. 8M43C. 60667. Engine Room Aft DG #4. MAK. 8M43C. 66068. Engine Rom Fwd DG #5. MAK. 12M43C. 69012. Engine Room Fwd Fuel oil sulphur content. Ratio emissions (% m/m) SO2 (ppm)/CO2 (%v/v) 4.50. 195.0 3.50. 151.7 1.50. 65.0 1.00. 43.3 0.50. 21.7 0.10. 4.3
1.5 Completed by:	Robert Layko (robert.layko)
1.6 Scrubber type (closed, reagent cycle, combination or hybrid open-loop effluent to seawater)?	Wet type: Open loop Scrubber systems are being used.
1.6 Completed by:	Robert Layko (robert.layko)
1.7 System status (operational, commissioning, under construction)?	All 4 Scrubber systems are fully operational.
1.7 Completed by:	Robert Layko (robert.layko)
1.8 Provide a process description and waste flow/chemicals used (Gaseous emissions, waste effluent, ash, spent reagents, etc.).	No chemicals are being used with this system. The effluent/ waste being generated is being collected in “bag type filters” These are being cleaned and changed according to AMOS or when pressure difference is to high. The waste from this is being saves in a drums and offloaded as non hazardous waste.
1.8 Completed by:	Robert Layko (robert.layko)
1.9 What scrubber process parameters are monitored (flow capacities, pH, other)?	Flow rates, tribity, pH, pAH, Nox, Sox, co2.
1.9 Completed by:	Robert Layko (robert.layko)
1.10 For seawater intake/effluent, please provide port locations (PS/STB Frame number, etc.). Additional notes can include distance below waterline and angles.	Scrubber systems for DGs #1, #2, and #6 are on the Stbd side incinerator room “D” deck Frame #94 Scrubber system for DG #5 is on the port side “D” deck Aux equipment room. Frame # 82
1.10 Completed by:	Robert Layko (robert.layko)

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.	I saw no changes from the previous year’s report for tanks and potential tank assignments. As what I believe to be a side issue and not

	particularly related to this question, a need was seen for the submission of a revised VSSP for two tank designations and this can be found discussed in the comments section of the HER VO for July 4, 2018.
2.1 Completed by:	Ronald Ladd (ronald.ladd)
2.2 Are ballast water tanks used for wastewater storage?	(From Bob Layco's 2018 very informative Ballast Report that was not actually required this year for the HER) comes a great majority of valid information contained in this AO Ballasting section of this AO report) Yes. Any of the Ballast water tanks can be used to hold WW with the exception of #2 Port and #2 Stbd and also the Fore Peak Tk which is now holding fresh water. #2 Port and #2 Stbd are presently filled with sea water. The ballast tanks that are presently used for WW storage are 1C, 3P, 3S, 4C, 5P, 5S, 5C, 7C, 85. Fore Peak: 234m3 Fresh Water 1 Center: 358.7m3 Permeate 2 Port: 335m3 clean ballast deep sea. 2 Stbd: 330m3 clean ballast deep sea. 3 Port: 205.2m3 Grey Water 3 Stbd: 205.2m3 Grey Water 4 Center: 209.3m3 Grey Water 5 Port: 330.1m3 Permeate 5 Stbd: 330.1m3 Permeate 5 Center: 218.2m3 Permeate 7 Center: 257.8m3 Permeate 8 Port: 231.2m3 Clean Ballast deep sea 8 Stbd: 231.2m3 Permeate 8 Center: 478.5m3 Clean ballast deep sea Total ballast water on board at this time is 665 m3. Total Ballast Water holding capacity is 5542 m3
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 ballast water tanks have common fill and discharge lines. The ballast water tanks that are being used for Grey Water (these being 3P, 3S, and 4C) use separate pumps and separate fill and suction piping with blocking valves incorporated into the system. Permeate is being discharged through the ballast water pumps when outside of VGP waters.
2.3 Completed by:	Ronald Ladd (ronald.ladd)
2.4 Ballast Water treatment installation? If yes, describe operation/system specifics.	No. There is no BWTS installed on the HER.
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.	There are no ballast water exchanges being performed in Alaskan waters. All ballasting operations were performed prior to arriving in Alaska.

	The Fore Peak Tank is filled with 234m3 of fresh water, #2 Port is filled with 335m3 of clean ballast deep sea water, #2 Stbd is filled with 330m3 of clean ballast deep sea water. The last ballasting operation recorded in the Ballast Log is as follows: Tank: 8C Time/date: 1945 hrs. on 24/06/18 Initial content: 200m3 Final content: 18 m3 Start position: 51-10.0' N and 130-06.5' W Pump or gravitate: Pump BWTS used: No Duration of operation: 1 hour 30 minutes Stop position: 51-32.4' N and 130-40.7' W Estimated volume: 182 m3 discharged Reason: Stability Depth: 606 m And with this latest discharge, the HER is only carrying 483 m3 of ballast water at this time.
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, there are no changes. The only change, which really isn't applicable but is somewhat related, would be that DG5 has now been fitted with an EGC system and Ocean Ranger Robert Layco has provided the particulars of this EGC system in Sections 1 and 1.a of this report.
3.1 Completed by:	Ronald Ladd (ronald.ladd)
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. All regarding this remains the same.
3.2 Completed by:	Ronald Ladd (ronald.ladd)
3.3 Are there any changes from the previous Additional Observation projects (section 3) on the incinerators make, model, fuel used, capacity?	No. All remains as was previously reported in the Combustion Source Inventory Assessment in 2017.
3.3 Completed by:	Ronald Ladd (ronald.ladd)
3.4 Average Hotel power (kW) in port and underway?	Approximately 6 MW in port and estimated, with variables, up to 7 MW when U/W.
3.4 Completed by:	Ronald Ladd (ronald.ladd)
3.5 Average fuel consumption in port and underway?	In port, approximately 1.5 MT per hour and when underway, up to 4.5 MT per hour which is speed and sea condition dependent.
3.5 Completed by:	Ronald Ladd (ronald.ladd)

4: Food Waste Garbage Handling

4.1 How is food waste handled and disposed of?	Food waste separation begins at the various galley waste station collection points and from there, will be delivered to the Garbage Room for further and more "refined" separation in plastic garbage pails. These garbage pails, full of food waste, will be dumped on a stainless steel table and separated once again removing any plastic, large bones, shells, broken crockery and any other waste that should not be introduced to

	the pulper. The stainless steel sorting table has magnets installed underneath to help in catching flatware or utensils from being missed but most flat ware is, to a varying degree, stainless steel and not that magnetic but the magnets under the sorting table is a sound idea. This sorting table has two circular openings that the food is "hand over hand" directed into were it will be ground through a pulping process, the water pressed out and the food product sent to a holding silo where it will be discharged outside of 12 nm. Food waste that can not processed in this fashion is stored in totes, kept in refrigerated storage spaces and offloaded in VIC. An image of two crew members working the Garbage Room separation table can be seen in Section A.9, photo #1, in the June 26, 2018 HER VO report.
4.1 Completed by:	Ronald Ladd (ronald.ladd)
4.2 Average food waste production per day (kgs/day)?	One week of food waste, divided by seven days, equals 9.08m3 of food waste daily.
4.2 Completed by:	Ronald Ladd (ronald.ladd)
4.3 Is the food waste de-watered? If yes, provide dewatering volumes and handling information.	Yes, it is de-watered and there is no practical or accurate way for this to be separately tracked as there are numerous sources of water that eventually end up in the Galley GW Tank but less than 1m3 per day of "de-watering" water has been estimated, and only estimated, to be the volumes involved in the food waste handling process. As food waste proceeds through the system the pulper and conveyance water is sent to the "lifting tank" and to fixed galley grease separators where oils and greases are removed. This water will be sent to the Galley GW Tank to be discharged outside of VGP waters.
4.3 Completed by:	Ronald Ladd (ronald.ladd)
4.4 How are glass bottles, broken crockery, and ceramics handled?	Glass beverage bottles (clear and colored - no separation) are crushed and landed ashore in FICB bags in VAN as "crushed glass" and will be recycled. Broken crockery, porcelain and related dishware, that is food contaminated, goes ashore in VIC in blue totes as regulated food waste. See the June 28, 2018 HER VO, section A.9, photo #1 for an image of a tote containing food contaminated broken crockery that was offloaded in VIC. Non-food contaminated broken dishware and related items are offloaded as dry waste.
4.4 Completed by:	Ronald Ladd (ronald.ladd)
4.5 How is food waste monitored and/or recorded?	This is tracked in the NAPA based Garbage Record Book and related information can also be found in the Garbage Room Foreman's Garbage Management records.
4.5 Completed by:	Ronald Ladd (ronald.ladd)

5: Sea Water Intakes

5.1 List all of the seawater intakes (chests); include the locations, frame, side (PS/SB) or compartment.	Forward cross over port side sea chest at frame 166/170, in the Aft Sewage Room. Forward cross over stbd side sea chest at frame 166/170, in the Aft Sewage Room. After cross over port side sea chest at frame 110/114 in the Forward Engine Room. After cross over stbd side sea chest at frame 106/110 in the Forward Engine Room. Stbd side EGC system sea chest at 94 in the Incinerator Room. (EGC system for DG1, DG2, DG4) Port side EGC system sea chest at frame 82 in the Auxiliary Room. (EGC system for DG5)
5.1 Completed by:	Ronald Ladd (ronald.ladd)
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?	The sea water strainers have standard steel strainers. The port and starboard, forward and after, cross over sea chest cleaning is performed every two months or when the differential pressure, across the strainer, indicates that a reduction in flow through the strainer is approaching the point where a cleaning needs, or soon will need, to be performed. The EGC system sea chest cleaning is performed every month or when, as with the cross over seas chest, the differential pressure, across the strainer, indicates that a reduction in flow through the strainer is approaching the point where a cleaning needs, or soon will need, to be performed.
5.2 Completed by:	Ronald Ladd (ronald.ladd)
5.3 How is debris and mud from filtration/strainers handled?	The debris, marine growth, organic matter, sea life, and mud are all collected in sealed, metal bins and offloaded in VIC.
5.3 Completed by:	Ronald Ladd (ronald.ladd)
5.4 Marine Growth Protection Systems in the sea intakes. Description of the control systems and information on checmicals if used.	No outside chemicals are introduced into the sea chest or at any other point in the sea water distribution system. All sea chest on the HER have Marine Growth Protection Systems that are of the "Electrolytic type" and manufactured by CATHELCO. The system consists of a control unit which supplies a small current flow to anodes (copper, aluminum) that are installed in the sea chest themselves. The copper anode produces ions, which are carried away by the sea water into the sea water distribution system to produce an anti-fouling and anti-corrosive protective film. The aluminum anode produce ions that suppress internal corrosion of the piping and components in the system. Concentrations of copper in the sea water solution, when the controller is properly set, is less then 2 parts per billion

	but enough to prevent marine life from settling (attaching and then growing) in the internals of the distribution system. The settings on the HER, on the on line serving sea chest is 2.80 amps and the offline sea chest setting is 0.40 amps. It is my opinion, that this system is effective provided that the internal piping and component system isn't already "bio-fouled". I would welcome a conversation with an electrolytic MGPS engineer regarding this opinion and if the application of an electrolytic MGP system, in an already bio-fouled system, would eventually clear the system. The basic principle on which electrolytic MGP systems operate is electrolysis and to be technically correct, electrolysis is actually "accelerated" galvanic corrosion and in this case, the corrosion of the installed sea chest anodes and intentionally so by the introduction of a D.C. current flow between these anodes.
5.4 Completed by:	Ronald Ladd (ronald.ladd)
5.5 Hull cleaning in place in Alaska 2018?	No. At this time, any anticipated hull cleaning will be performed in either SEA or VIC.
5.5 Completed by:	Ronald Ladd (ronald.ladd)

6: General

6.1 Is vessel crew cooperative on this project?	Yes, Crew was helpful with the information gathered.
6.2 Do you feel the vessel has a clear understanding of compliance requirements?	Yes, ship is using Scrubber systems on DGs using HFO and using MGO while in special areas.
6.2 Completed by:	Robert Layko (robert.layko)
6.3 Are there other remarks/ comments the OR wants to share?	For whatever "Pronto Form" or "other" reason, R. Alan Ladd was not able to sign his name in the signature block along side that of Ocean Ranger Robert Layco.
6.2 Completed by:	robert.layko ronald.ladd

Z: Signature & Submit

Ocean Rangers contributing to this report:	Robert Layko (robert.layko) Ronald Ladd (ronald.ladd)
Ocean Ranger Signature: