

## Background:

RCL / CEL (RCL) provided on January 21, 2010 the "Update Interim Source Evaluation Report" dated January 15, 2010.

RCL could not meet the reporting deadline of the January 15, 2010 delivery, and requested an extension. The extension was granted by ADEC. On August 19, 2008 RCL responded by providing updated annual SRE.

The review items in this internal document identifies the items that to be addressed / included in the future Source Reduction Evaluation (SRE) reporting by RCL.

The items are set out below.

## Discussion:

This updated proposed SRE include all actions taken by RCL in 2009. RCL was not able to get the AWTS system on the Radiance of the Seas (Hydroxyl) and Rhapsody of the Seas (Navalis) working to meet the 33 CFR 159 certifications.

RCL believes that treatment based on Ozone technology is not viable. RCL is now looking in other oxidation technologies.

RCL is also determining in 2009 how operational modifications can be made to withhold all discharges while in Alaska waters.

It appears that RCL CEL used HAL SRE plan application as basis earlier used (example / framework).

- **I Source Reduction of Inflows:** RCL CEL identifies chemical research, bunker waters, additional waste handling, adoption of better operations, corrosion piping etc. SRE does not contain in this section the AWTS system influent from technical water sources, spa's, ponds etc.
- Cleaning product evaluations and possible switch to non-chemical cleaning products. RCL CEL mentioned that some floor cleaning products contains Zn components.
- Chemical evaluation appears to be completed over the 1,000 products are listed. RCL did not include a control system for evaluation for the future when new products may brought in and needs to evaluated. Some products (minor use) did very low parts of Zn.
- Bunker water testing and evaluation. RCL does not include tank storage regime and how the potable bunker water is handled, treated. RCL mentioned that ports should take bunker water infrastructure changes, but remain uncertain if the Port will do the changes. Absent support information ADEC could not validate these statements regarding infrastructures. Boiler water and other possible "process waters" (e.g. hair salon) are not included or mentioned.
- HVAC (technical water) water inflow, RCL promised to discuss this item. However in the annual report was not expanded on this item.

Rev: 0

- Radiance of the Seas and Serenade of the seas are Scheduled to replace metallic potable water piping from risers to cabin. The risers appear to be changed already, the piping not. RCL did not include time line or other details of the planned piping project. The potable water distribution manifold on the Serenade of the Seas is replaced with plastic. RCL believes that steady replacing of metal pipe will reduce metal loads over time. Note: RCL did not include fittings, couplings, and other pipe system apertures.
- Radiance of the Seas and Serenade of the Seas did confirm (report) that they are fully complying with the RCL's potable water treatment policy to minimize soft water corrosion. This system description of the potable water treatment was not included in the report.
- **II Treatment Technology Evaluation:** Not discussed in the 2009 Report. Specific sampling results on the AWTS systems were not available / or shared.

### **Ocean Ranger Additional Observation:**

This project was started after the ADEC CPVEC NWCA meeting on August 14, 2009 (8/14/2009). During that meeting it was identified that ADEC CPVEC and the Ocean Rangers would conduct a "Source Reduction Plan Survey" on board of the vessels. The Serenade of the Seas shortly after this action provided information that the vessel would not discharge, and not subject under the GP. Additional observations were not made on the vessels, the camera problems and "end of season" caused that this project could not completed.

At the end of the season wrap up, staff reviewed the ship specific notebooks (SSN) from the Ocean Rangers. In the SSN of the Vision Class (e.g. Rhapsody) was USCG Navilus AWTS certification (type approval) issued. This certification is valid till 2013.

### **Conclusion:**

The 2009 SRE does not provide detailed information regarding the step taken. The SRE is an expansion on the previous SRE. RCL also include that "non discharge" may be a solution. The SRE appears "sketchy" non conclusive and it is not clear how the items translate to the vessels. Also the AWTS systems that did not pass the USCG test, was not identified which pollutants were "problematic".

Please note that following items below are recommended for consideration of the review of future RCL CEL SRE reporting:

### **ADEC RCL Future SRE Reporting Attention Items:**

@RCL to include details and more conclusive follow up on the "chemical lists";

@Bunker water (water intake) is "lean" no ports or volumes clear listed. (Repeat item) RCL CEL in future reports to include this data including the volumes, and storage regimes. For all bunkered waters for the "AK trade".

Rev: 0

@RCL CEL Evaporator data is mediocre, more details and system discussions needed. Piping / bundle material of the EVAPs system in order to properly evaluate. (Repeat item)

@If RCL CEL operational changes of AWTS, use of products that could lead to pollutant reductions, the operations / procedures / products should be identified for future reference (compliance verification).

@Technical water, boiler water, equipment wash waters, spa and pool waters are not addressed in detail in SRE. The future reporting should include (if applicable) these waste streams as well / related systems. (Repeat issue)

@Wastewater volumes to be included in future SRE reporting. ADEC has not much information on file (regarding sampling) of the RCL CEL ships. RCL CEL needs to confirm the volumes and AWTS processed volumes. Current information too "generic". (Repeat issue)

@Operational changes to be documented and categorized in relation with the pollutant reduction. Repeat issue.

Juneau, February 22, 2010

CPVEC Internal