

Cruise Industry: synergies for environmental sustainability

**Pan European Dialogue launch conference
Environmental session
5 March 2015**

Brussels



Commitment to environmental sustainability

Clean oceans and beaches are crucial to the cruise experience



Innovative Technologies

- Waste water treatment
- Emission reduction (scrubbers...)
- Energy efficiency on board



Environmental programs

- Compliance with international, national and local rules
- Training, oversight and implementation of environmental practices on board



Environmental stewardship for passengers and crew

- Encourage “green” practices on-board (e.g. recycling waste, limiting water consumption, ..)

A sustainable yet competitive industry

The cruise industry is global and mobile

Environmental regulations should be:



TO KEEP EUROPE A
SUSTAINABLE AND COMPETITIVE
TOURIST DESTINATION

Compliance with sulphur emission rules

Legal regime:

- Stricter requirements as of January 2015 in SECAs (0,1% sulphur content)
 - Compliance through use of expensive low sulphur fuel or alternative abatement methods (e.g. scrubber)



COMPLIANCE COMES AT A COST

Cruise industry commitments to sustainable shipping:

- Active engagement with national and international regulators to find solutions to reduce emissions (IMO, ESSF)
- Work with manufacturers to develop solutions for cleaning exhaust gases (e.g. prototypes of scrubbers installed on board, trials of particulate filters)

Compliance with sulphur emission rules

MAIN CHALLENGE:

**LEGAL
UNCERTAINTY**

For e.g. use of **open loop scrubbers**: accepted by IMO and EU “Sulphur Directive”, but may be ostracized locally (some EU ports/estuaries)

Punishes early movers and hampers commissioning of future installations

Need for:

- Pragmatic and flexible approach by regulators
- Facilitate use of all alternative compliance methods

Carnival Corporation EGCS Technology

Open Loop System

- Uses sea water to create the sulphur absorption process naturally.
- The salt in sea water naturally absorbs the sulphur from the exhaust gas;
- Additional equipment is used to improve the quality of the absorbed sea water before discharge overboard;

Unique & Innovative Features

- Air quality

The Compact “Dry” Filter significantly reduces:

- ✓ Particulate Matter (PM)
- ✓ Soot

- Wash-water quality

Lab analysis campaign clearly indicates that wash-water quality is already well within IMO, VGP, Baltic, EU WFD, and other major world standards.

Wash-water results measured against:

- ✓ IMO requirements
- ✓ US VGP
- ✓ EPA requirement for ECA Exempt ships
- ✓ Alaska



Wash-water Sample Results Comparison

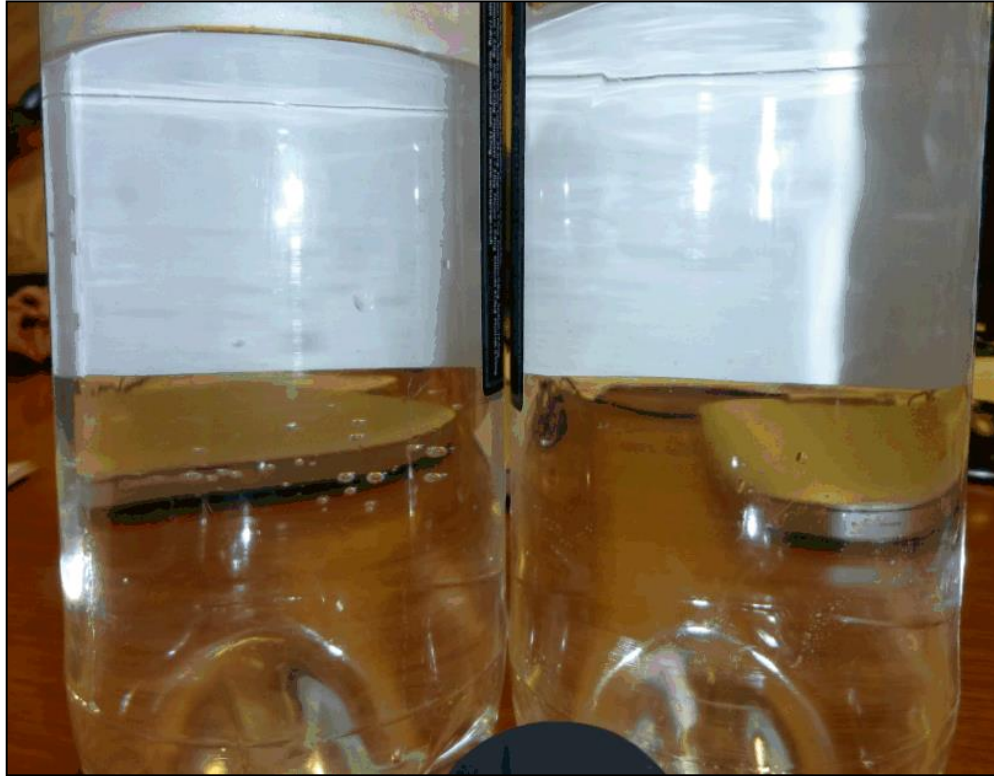
PARAMETER	IMO/EU	Baltic	WFD	Grand Princess		Ryndam	
	Scrubber Washwater Limitations	MEPC.227(64) Annex 22 - Effluent Standards	AA-EQS - Other Surface Waters	Sample Date: 18 Dec 14 Location: Ensenada, Mexico		Sample Date: 31 Oct 14 Location: Western Med	
Exhaust Gas Cleaning System: PARAMETER MEASURING							
				SW Inlet	SW Outlet	SW Inlet	SW Outlet
PAH	50 µg/L above inlet water PAH concentration for 45 t/MWh flow rates	Not Required	Required	Not Detected	1.94 µg/L	Not Detected	2.24 µg/L
pH	Compute model	6.0 - 8.5	Not Required	7.9	6.0	7.3	6.3
Turbidity	25 FNU/25 NTU	Not Required	Not Required	**	**	**	**
Nitrite	Required	Required as Sum of Total Nitrogen	Not Required	Not Detected: Reported as Nitrate+Nitrite	Not Detected: Reported as Nitrate+Nitrite	Not Detected	Not Detected
Nitrate	Prevent discharge beyond that associated with 12% NOx removal from exhaust or beyond 60 mg/L at 45 t/MWh	Required as Sum of Total Nitrogen	Not Required	Not Detected: Reported as Nitrate+Nitrite	Not Detected: Reported as Nitrate+Nitrite	Not Detected	Not Detected
Total Arsenic	Required	Not Required	Not Required	**	**	Not Detected	Not Detected
Total Cadmium	Required	Not Required	0.2 µg/L	Not Detected	Not Detected	Not Detected	Not Detected
Total Chromium	Required	Not Required	Not Required	Not Detected	Not Detected	Not Detected	Not Detected
Total Copper	Required	Not Required	Not Required	Not Detected	Not Detected	Not Detected	Not Detected
Total Lead	Required	Not Required	1.3 µg/L	Not Detected	Not Detected	Not Detected	Not Detected
Total Nickel	Required	Not Required	8.6 µg/L	Not Detected	Not Detected	Not Detected	20 µg/L
Total Vanadium	Required	Not Required	Not Required	Not Detected	Not Detected	Not Detected	70 µg/L
Total Zinc	Required	Not Required	Not Required	Not Detected	Not Detected	Not Detected	100 µg/L

** Parameter not tested during sampling



Wash-water Sample Results Comparison

Discharge water quality, typical sample



- Left bottle is from the scrubber tower outlet.
- Right bottle is from a drinking fountain.

EU Port Reception Facilities Directive

The cruise industry is a front runner on waste management:

- On board separation in up to 12 different waste streams and storage for duration of cruise voyage
- Programmes to reduce waste generated onboard

EU Port Reception Facilities (PRF) Directive (2000/59/EC)

→ obligation for ports to have adequate facilities for waste reception

CHALLENGES

1. PRF infrastructure

- Lack of capacity to receive liquid waste
- Segregated waste mixed together when sent ashore

2. Transparency in the fee mechanism

- “no-special fee” approach



EU Port Reception Facilities Directive

CHALLENGES

3. Unbalanced regulatory regime for ship-shore interface

While ships are fined/detained for lack of compliance with EU PRF Directive, no actions are taken against non-compliant ports

4. Lack of “end of waste” definition

The PRF Directive includes mandatory discharge of waste in ports – no possibility to consider onboard waste as a resource!



More efficient PRF

Review of the PRF Directive

TO ENSURE
Environmental sustainability
Harmonised implementation
Competitiveness

Conclusions

Technology-dependent legislation should be:

PRACTICAL

Regulations should be based on sound science

FAIR

Regulations should be akin to those applying to land-based activities

COST-EFFECTIVE

Regulations should be achieved at the least cost through multiple compliance options

SHARED

Shipping is only one part of the maritime sector:
All stakeholders must do their part!



Thank you for your attention!

