



Conference on:

**Ballast Water Management
Systems**

21 October 2014

Introducing:

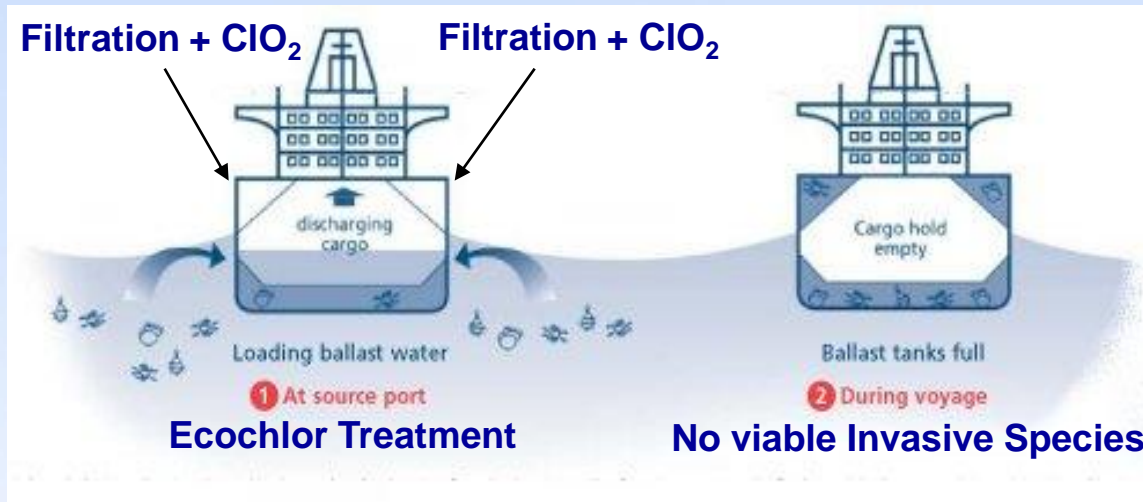
Ecochlor Ballast Water Treatment Systems



Key Points: Ecochlor BWTS

- **It's Simple:**
- **It Works:**
- **It Simply Works:**
- **In Addition:** Comparison Data requested by Chios

It's Simple!



It's Simple!

- **Two step Process:**
 - Filtration and Chemical injection only.
 - Easy to install: Retrofits and NB.
- **No Treatment on Discharge:**
 - No neutralization.
- **No adjustment of dosage:**
 - Same dosage, all the time, everywhere.
- **Not effected by:**
 - Salinity, Temperature, Sediment.
- **No Crew Interaction:**
 - Fully automated.



It Works!

- **Completely Effective:**
 - Chemistry unmatched in performance.
 - Treatment easily verifiable to Port State Control.
- **All Ecochlor Systems are Operational**
 - Over 1,000 weeks of operational experience.
- **We will share ALL of our data:**
 - Land-based, shipboard, everything!
 - Business Card + USB
- **Chemicals re-supplied for 10 years.**
 - Europe, N America, China and Japan.
 - Key Bunkering Ports (Singapore, Fujairah).



It Simply Works!

- **Ship owners: you are not buying “systems”.**
- **Your buying Regulatory Compliance!**
 - The system must be Type Approved.
 - The system must be operational and verified.
 - The crew must understand the system.
 - All log books / paper work must be in order.
- **Consequences for not working!**
 - PSC, Charters, Resale.
- **USCG Type Approval?**
 - Testing March '15 – Golden Bear.



Ecochlor System Comparison



Parameters	35,000 DWT Bulker	80,000 DWT Bulker	180,000 DWT Bulker
Vessel Information			
DWT	35,000	80,000	180,000
Number of Pumps	2	2	2
Flow Rate (Individual Pumps) (m3/hr)	350	1000	3000
Flow Rate (Total) (m3/hr)	700	2,000	6,000
Ballast Tank Capacity (m3)	10,000	30,000	55,000
Assumed Number of Ballasting Operations Per Year	10	10	10
Total Annual Ballast Volume	100,000	300,000	550,000
Tank Size	1	3	5
Refill 2x per year	2	2	2
Ecochlor System Configuration	ES-700S-1.0	ES-2000S-3.0	ES-6000-5.0
Comparison Parameters Requested of Presenters			
Typical Consumed Power (Maximum) (kWh)	4.6 (6.3)	7.0 (14.5)	12.2 (37.1)
Liquid Chemicals Supplied Annually Purate TM BWT and Sulfuric Acid (each) (m3)	1.5	4.5	8.3
Operating Cost per Cubic Meter Water Treated (\$/m3)	\$0.06 - \$0.08	\$0.06 - \$0.08	\$0.06 - \$0.08
Maintenance Cost (\$/Annually)	TBD	TBD	TBD
Volume (We assume this means m3 of water treated annually) (m3)	100,000	300,000	550,000
Price	TBD	TBD *	TBD

- Provided by Chios
- Assumptions made to determine system configuration
- Determined based on system configuration

Ecochlor System Comparison



Power requirements for selected size vessels:

Vessel	kWh
	average (max)
35,000 DWT Bulker:	4.6 (6.3)
80,000 DWT Bulker:	7.0 (14.5)
180,000 DWT Bulker:	12.2 (37.1)



Ecochlor System Comparison



Initial Engineering Packages (IEP):

Technical Specifications

(capacity, footprint, weight, electrical)

Scope of Supply

(provided by Ecochlor, needed for installation)

Spare Parts Recommendations

(filter, generation system)

Process Overview

Business Card + IEP

If you want Both USB and IEP: Business Card + Both

Key Points: Ecochlor BWTS Review:



- **It's Simple:**
 - Easy / Relaxed
- **It Works:**
 - Succeeds / Functions
- **It Simply Works:**
 - Comply with Regulations
 - Prove Compliance to Regulators
- **Simple is Better!**





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