

Two Ballast Water Treatment Technologies

Presented By:

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Hyde Marine, Inc.



Hyde Marine's Parallel Path

- Ballast Water Treatment System
 - Filtration & Disinfection
- SeaKleen®
 - A natural biocide

Hyde Marine BWT System



CORAL PRINCESS



Disk Filter



Medium Pressure UV

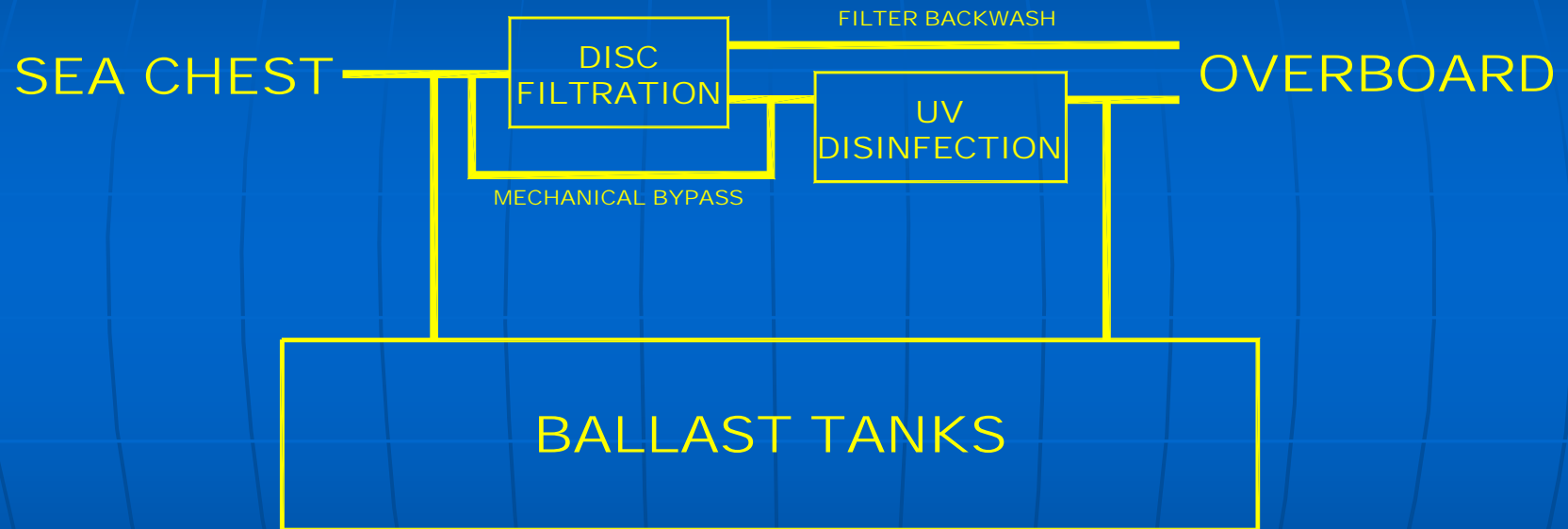
GREAT LAKES BALLAST WATER CONFERENCE

September 27, 2006 Cleveland OH



HONEST SOLUTIONS. HONEST EQUIPMENT

Hyde Marine BWT System



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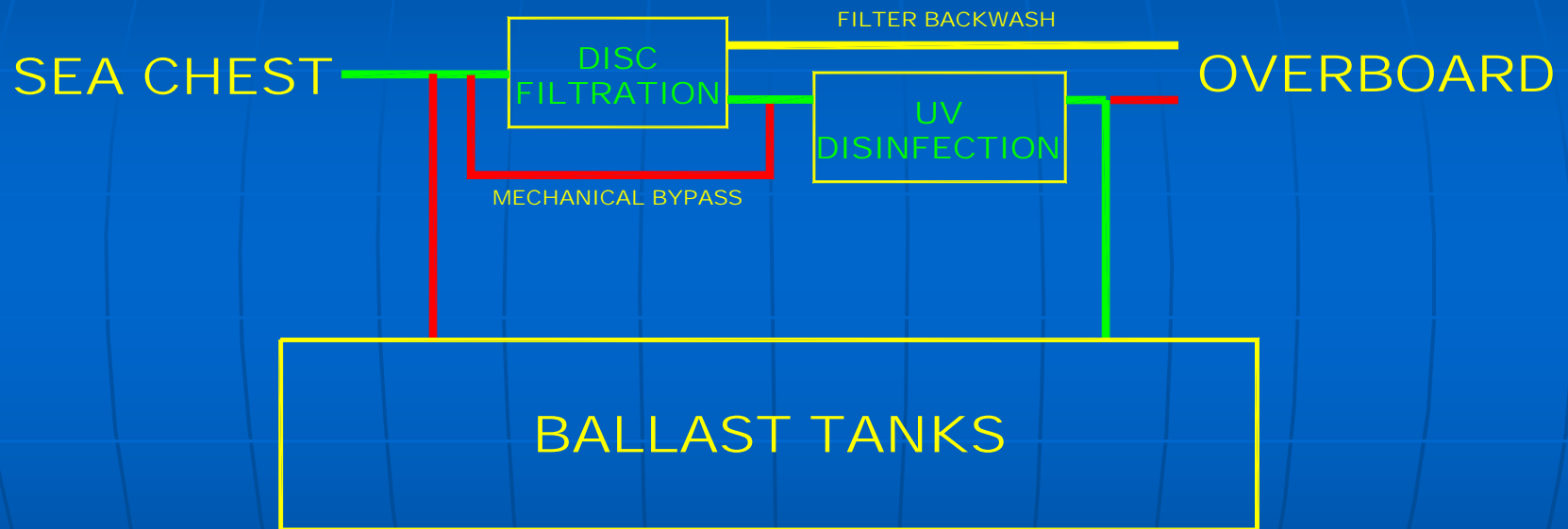
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BALLAST MODE



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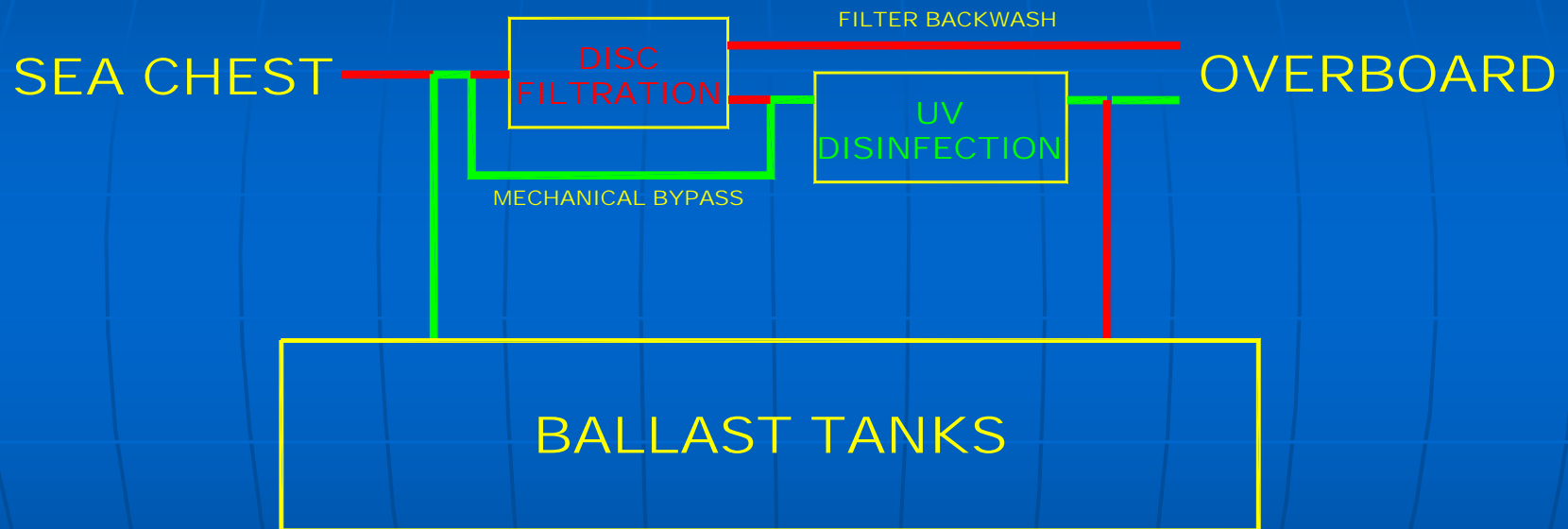
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DE-BALLAST MODE



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HONEST SOLUTIONS. HONEST EQUIPMENT

Hyde Marine BWT System Full Scale Testing

- Great Lakes Ballast Technology Demonstration Project Barge Testing
 - 1998 Screen Filtration
 - 2000 Screen Filtration/Cyclonic Separation/UV
 - 2001 Arkal Disk Filtration and UV
- 2000 Testing on "Regal Princess"
- 2001 "Cape May" Testing of UV/Filtration
- 2001-03 Multi-Ship Testing
- 2004 "Coral Princess" STEP Testing
- 2004-06 Baltimore Harbor

Hyde's Installed Systems

- UV Treatment with Cyclonic Separation
 - April 2000 – “Regal Princess” – 200 m³/hr
 - Aug. 2001 – “Sea Princess” – 220 m³/hr
 - Mar. 2002 – “R. J. Pfeiffer” – 350 m³/hr
 - Feb. 2002 – “Star Princess” – 255 m³/hr
 - Apr. 2002 – “Stolt Aspiration” – 250 m³/hr
- UV Treatment with Filtration
 - May 2003 – “Coral Princess” – 250 m³/hr
 - Oct. 2006 – “Celebrity Mercury” – 210m³/hr

USCG STEP Results

Type of Test and Date Performed	Percentage removal of >50µm organisms	Citation
October 2004 shipboard trial aboard MV Coral Princess. Final trial comprised nominal 55µm backwash filter and nominal 200mJ/cm ² UV treatment on ballasting and UV treatment only on deballasting.	100%	Wright, D.A., R. Dawson (V), C.E. Orano-Dawson, S.M. Moesel (2006), A Test of the Efficacy of a Ballast Water Treatment System Aboard the Vessel Coral Princess. Mar. Technol. (in press)

Hyde Marine BWT System

- Capacities to meet any requirement
 - Small Footprint – Modular Construction
 - New Builds or retrofit in service
- Simple Operation
 - Fully automatic
 - Safe – No Chemicals
 - Minimal Maintenance
- MEETS USCG and IMO STANDARDS

SeaKleen® A Natural Biocide



SEABULK MARINER



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HONEST SOLUTIONS. HONEST EQUIPMENT

SeaKleen® A Natural Biocide

- Cost Effective – 10 to 20 cents per tonne
- Highly Soluble in Fresh and Salt Water
- Not Corrosive to Piping or Ballast Tanks - Unlike Oxidizing Biocides
- Delivered in Safe Powder Form – Can be Stored on Board and Handled by Crew With No Special Training
- Low Affinity for Particulate Matter and Sediment

SeaKleen® A Natural Biocide

- Particularly Suitable for Bulk Carriers and Tankers with Large Ballast Volumes
- Naturally Degrades And Is Quickly Diluted To Non-toxic Levels
- Straightforward Dosing Under all Ballasting Conditions Including Gravity Ballasting
- Tested aboard the Seabulk Mariner in August 2006

SeaKleen® A Natural Biocide

- 2001 "Cape May"
- 2004-06 Baltimore Harbor
- 2006 "Seabulk Mariner"

SeaKleen® A Natural Biocide

Full Scale Test Results from Seabulk Mariner

- Zooplankton densities per m³ in untreated (1S) ballast tank (8 taxonomic groups)
 - >50um : 17,585 ± 2,182
 - <50um : 1,150 ± 468
- Zooplankton densities per m³ in treated (5P) ballast tank (1.52mg/L SeaKleen) – 0
- Zooplankton densities per m³ in treated (5S) ballast tank (0.75mg/L SeaKleen) – 0

Baltimore Harbor Test Facility



MPA Pier 1 Baltimore Harbor

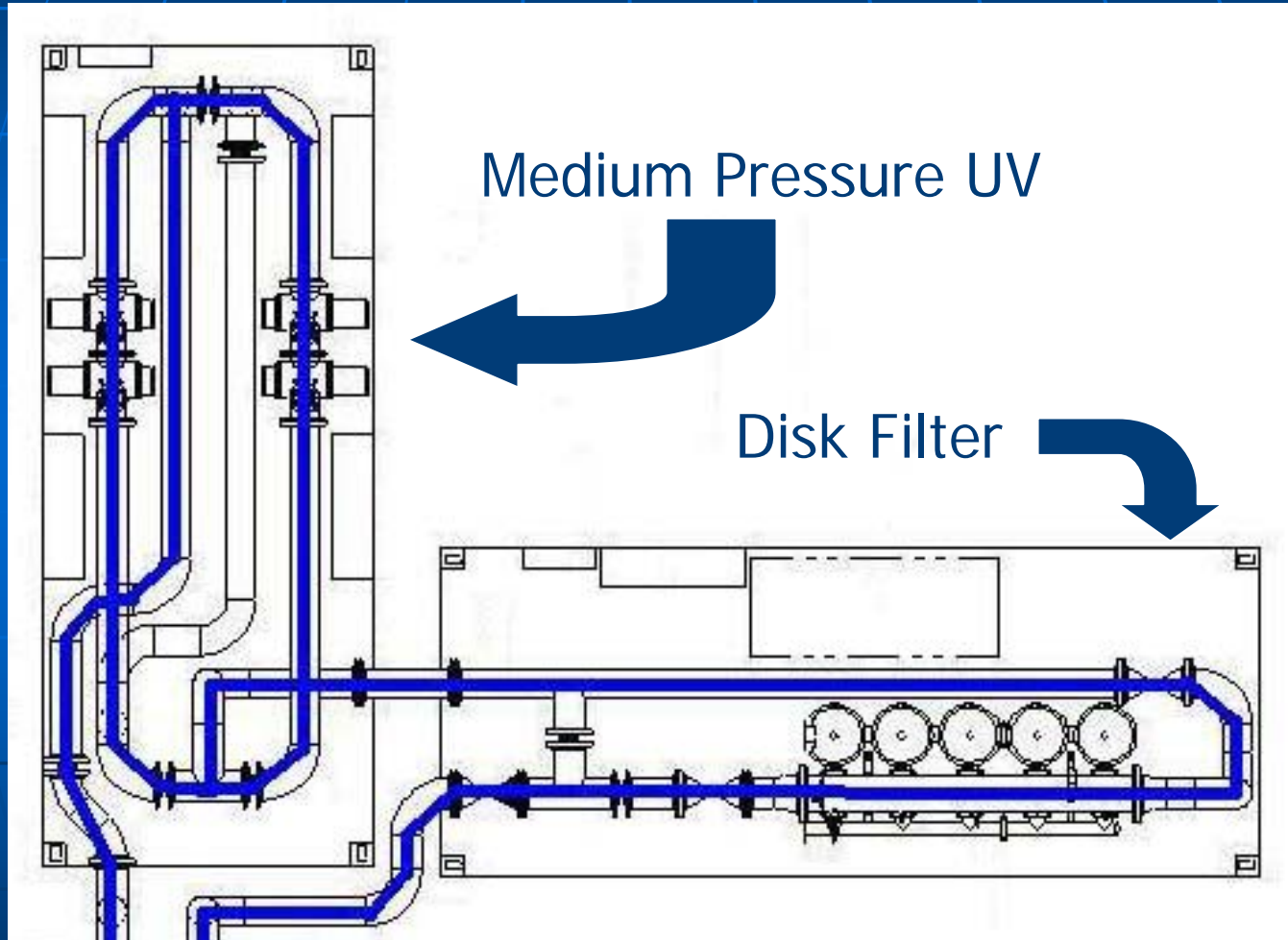
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Baltimore Harbor Test Facility



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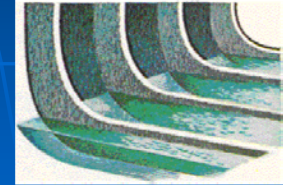
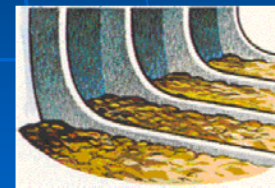
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HONEST SOLUTIONS. HONEST EQUIPMENT

Hyde H-136 Ballast Tank Mud Remover

- Proven for over 40 years
- Increases Cargo Capacity
- Helps eliminate invasive species in ballast tanks
- Low dosage rates
- Safe handling and easily injected



Hyde Marine Ongoing Activity

- Continuing Development and Refinement of BWT Technologies
- New Applications for Shipboard UV Treatment Systems
 - Waste Water Treatment Effluent Disinfection
 - Potable Water Disinfection
- Ballast Water Management Systems

QUESTIONS??

***THANK YOU FOR
YOUR ATTENTION***

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