UNDERSTANDING MISCONCEPTIONS ABOUT THE IMO & USCG BALLAST WATER REGULATIONS

April 15, 2014
Forward Looking Statements

This presentation contains historical information and forward-looking statements. Forward-looking statements typically contain words such as “expect,” “believe,” “estimate,” “anticipate,” or similar words indicating that future outcomes are uncertain. Statements looking forward in time, including statements regarding future growth and profitability, price increases, cost savings, broader product lines, enhanced competitive posture and acquisitions, are included in the company’s most recent Annual Report pursuant to the “safe harbor” provision of the Private Securities Litigation Reform Act of 1995. They involve known and unknown risks and uncertainties that may cause the company’s actual results in future periods to be materially different from any future performance suggested herein.

Further, the company operates in an industry sector where securities values may be volatile and may be influenced by economic and other factors beyond the company’s control. Some of the factors that could affect future performance of the company are higher energy and raw material costs, costs of imports and related tariffs, labor relations, availability of capital and environmental requirements as they relate both to our operations and to our customers, changes in foreign currency exchange rates, borrowing restrictions, validity of patents and other intellectual property, and pension costs. In the context of the forward-looking information provided in this news release, please refer to the discussions of risk factors.
Today’s Presenter

Mark Riggio, Hyde Marine Product Manager
Graduate of the United States Merchant Marine Academy

Mark started his career as a Surveyor for ABS, surveying vessels in North and South America, Europe and Asia. He also worked for R&B Falcon Drilling company as a Compliance Engineer. Most recently, he worked for Crowley Maritime Corporation as a Port Engineer with their US Maritime Administration RO-RO vessels in Baltimore, MD then serving as Fleet Manager of their Marine Transport Lines RO-RO vessels in Charleston, S.C.

He operates his own maritime consulting company, Blue Seas Environmental Consulting, and served as a consultant to the US Government on maritime matters.

As Port Engineer of the M/V CAPE WASHINGTON, he helped design the first permanent shipboard Ballast Water Testing Facility as part of the MERC development team.

He is co-author of a number of works on the Ballast Water Treatment market including the published “Preview of Global Ballast Water Treatment Markets.”
Agenda

• IMO Convention Update and Revised Implementation Schedule
• USCG Ballast Water Management requirements
• Environmental Protection Agency VGP
• USCG / EPA Enforcement
• Advantages of Installing an AMS-approved System Now
• Road to USCG Type Approval
• Validity of Ultraviolet (UV) Systems in the U.S.
IMO CONVENTION UPDATE
Signatory Countries & Notable Exceptions

Total Ballast Water Treatment Systems Market: IMO Convention Ratified Countries, Global, 2013

- Kenya
- Trinidad and Tobago
- Montenegro
- Albania
- South Africa
- Maldives
- Syrian Arab Republic
- Lebanon
- Kiribati
- Niue
- Cook Islands
- Mongolia
- Palau
- Nigeria
- Iran (Islamic Republic of)
- Sierra Leone
- Saint Kitts and Nevis
- Sweden
- Egypt
- Tuvalu
- Barbados
- Mexico
- Croatia
- Spain
- Brazil
- Canada
- Russian Federation
- Netherlands
- France
- Malaysia
- Denmark
- Antigua and Barbuda
- Germany
- Korea, Republic of
- Norway
- Marshall Islands
- Liberia

Source: UNCTAD Database; Frost & Sullivan
## Notable Exceptions

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<thead>
<tr>
<th>Country</th>
<th>Type of Registry</th>
<th>% World Tonnage</th>
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<tbody>
<tr>
<td>Republic of Panama</td>
<td>Open</td>
<td>21.46%</td>
</tr>
<tr>
<td>Peoples Republic of China, Hong Kong Special Administrative Area</td>
<td>National</td>
<td>7.64%</td>
</tr>
<tr>
<td>Singapore</td>
<td>Open</td>
<td>5.37%</td>
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<tr>
<td>Greece</td>
<td>National</td>
<td>4.74%</td>
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<tr>
<td>Malta</td>
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</tr>
<tr>
<td>Bahamas</td>
<td>Open</td>
<td>4.52%</td>
</tr>
<tr>
<td>Peoples Republic of China</td>
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<tr>
<td>United Kingdom</td>
<td>National</td>
<td>2.86%</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Open</td>
<td>2.16%</td>
</tr>
<tr>
<td>Japan</td>
<td>National</td>
<td>1.54%</td>
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</table>

Ratification by an additional 4.62% of World Tonnage remains for implementation.
## Original Schedule

### Original IMO Schedule

<table>
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<tr>
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</tbody>
</table>

- **New Vessels Only**
- **Retrofit & New**
- **All Vessels**
IMO MEPC 65

• Committee introduced proposal to meet Ship Owner concerns about BWMS implementation
  – Tied BWMS installation date to MARPOL certificate (5 year window, not 2-1/2 year dry-docking interval)
  – Recommended enforcement of discharge standard be suspended until 2016 (sampling)
  – Made all existing ships retrofits

• Passed by committee

• Reviewed and approved by IMO General Assembly during December 2013 meeting
## Implementation Schedule

**IMO Schedule, MEPC 65, Assumes Ratification 2Q 2014**

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*New Build, Keel Laid after Ratification - *vessels keel laid after Ratification of BWMC 2004*
Implementation Curve

Assumes rated implementation curve (equal number of ships per month) and 45,000 ships to be retrofit (68,400 total ships including new builds since 2009).
Assumes IMO ratification in Q2 2014
ICS and Reopening G8

• International Chamber of Shipping, supported by many other Ship Owner associations requested reopening G8 during PPG-1 and MEPC 66

• Suggested Type Approval testing needed to be improved, increased transparency provided

• IMO did not accept request but commissioned a study of in-use ballast water treatment systems within 3 years

• No presented evidence of systems not functioning in shipboard application
USCG BALLAST WATER RULE
USCG Final Rule

• Became law June 2012

• First implementation dates have passed
  – January 1, 2014 (retrofit of vessels between 1500 -5000m³ ballast)
  – New Construction vessels with keels laid after December 1, 2013

• USCG requires vessels to fit systems at first out-of-water drydocking after anniversary date
  – Not tied to MARPOL Certificate like IMO

• Ships must be fitted with a USCG Type Approved BWMS or be registered in STEP for permanent use in the US
  – Four other options for compliance exist
Alternate Means of Compliance

Vessels may choose alternate means of complying with US discharge standards:

1. Use water from a US public water system (PWS) that meets 40CFR parts 141 and 143
2. Do not discharge ballast water into US waters
3. Discharge to a facility onshore or to another vessel for the purposes of treatment
4. Use an alternate management system (AMS) that meets the requirements of § 151.2026

Source: 33CFR151.2025
Alternate Management Systems

• Ballast water treatment systems that have achieved approval by a foreign administration may be granted approval by the USCG under § 151.2026

• Shown to be at least as effective as ballast water exchange

• Approval gives Owners/Operators five years to operate the system after the vessel’s compliance date
## USCG Timeline 2012-2025

### USCG Ballast Water Management Regulations

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<td>Keel Laying On or after Dec 1, 2013</td>
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<td> </td>
<td><strong>New Vessels - On Delivery</strong></td>
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</table>
| Before Dec 1, 2013 | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Drydocking Window**
| &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Vessels 1500-5000 m³** |
| Before Dec 1, 2013 | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Drydocking Window**
| &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Vessels <1500 m³** |
| Before Dec 1, 2013 | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Drydocking**
| &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | &nbsp; | **Vessels >5000 m³** |

**Jurisdiction - US territorial sea (12 nautical miles)**

**Applicability -** Sea-going vessels previously required to conduct BWE and sea-going vessels that do not operate outside EEZ but are greater than 1,600 GT and transit between Captain of the Port Zones

**Great Lakes -** Applies to vessels that depart the Great Lakes beyond the EEZ, return and pass upstream of Snell Lock, aka “Salties.”
USCG Extensions

- USCG started issuing extensions to BWMS compliance dates on December 27, 2013

- Extensions granted due to vessels “not being able to meet requirements”
  - No USCG Type Approved systems currently available

- Extension requests are granted on a ship-by-ship basis and posted on USCG website

- Currently 110 ships listed on USCG website
  - https://homeport.uscg.mil/
# First 17 Ships Receiving USCG Extensions

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>ON / IMO</th>
<th>Extended date</th>
<th>Granted</th>
<th>Year Built</th>
<th>Gross Tons</th>
<th>Class</th>
<th>Flag</th>
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<td>Alexandra</td>
<td>Barge</td>
<td>290273</td>
<td>1-Jan-16</td>
<td>27-Dec-13</td>
<td>1963</td>
<td>8512</td>
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<td>Calamity Jane</td>
<td>Dredge/UW Support</td>
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<td>27-Dec-13</td>
<td>1978</td>
<td>10493</td>
<td>LR</td>
<td>Panama</td>
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<td>2002</td>
<td>85942</td>
<td>LR</td>
<td>Panama</td>
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<td>Clipper Mistral</td>
<td>General Cargo</td>
<td>9141742</td>
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<td>1998</td>
<td>6310</td>
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<td>Cold Stream</td>
<td>Refer Cargo</td>
<td>9051791</td>
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<td>27-Dec-13</td>
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<td>8414</td>
<td>BV</td>
<td>Netherlands Antillies</td>
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<td>Expansa</td>
<td>Container</td>
<td>9234422</td>
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<td>55451</td>
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<td>7002</td>
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<td>1-Jan-16</td>
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<td>1976</td>
<td>5746</td>
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<td>2011</td>
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<td>LPG Carrier</td>
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<td>9142</td>
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<td>Melissa Desagnes</td>
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<td>Maasdam</td>
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<td>1993</td>
<td>55575</td>
<td>LR</td>
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USCG Extension Facts

• All 110+ extensions issued to the same date: January 1, 2016

• Installation of system no longer tied to drydock date or any other survey
  – Systems must be installed before January 1, 2016 even if ship does not go to a drydock

• Extensions do not cover compliance with EPA Vessel General Permit
EPA VGP AND ENFORCEMENT
EPA VGP

- EPA Vessel General Permit (VGP) 2013 became effective December 19, 2013

- VGP covers 27 separate discharges
  - Requires development of management practices and use of “Best Available Technology”

- USCG AMS systems fully compliant with VGP

- No mechanism for granting extensions
  - Ships need to apply for an individual permit

- VGP contains additional sampling and reporting requirements
VGP Enforcement

• Enforcement of VGP is by USCG under signed MOU

• USCG extensions of implementation date for ballast treatment are not accepted by EPA

• Policy Letter issued that enforcement of ballast numerical discharge standard was “low priority” for those ships granted a USCG extension
  – Vessels still must report violation of VGP under reporting requirements
EPA VGP Discharge Violations

• Under the Clean Water Act, any party may bring suit against permit violators

• Citizens and Environmental Groups may sue individual vessels who discharge without a treatment system

• EPA letter does not state vessels are compliant with permit
  – Will not at this time seek to enforce the penalties
EPA Sampling

- EPA VGP requires vessels operating in US waters to periodically sample
  - 4 times per year for systems with “low quality data”
  - 2 times per year for systems with “high quality data”

- Sample results submitted as part of annual report
BENEFITS OF AMS
What AMS Means

• USCG allows installation of AMS-approved systems provided Type Approved systems are not available for the vessel

• AMS systems can be used for five years following implementation date of the vessel
  – Installation date of system does not affect how long the system is acceptable

• AMS systems are fully compliant with EPA VGP requirements
AMS Advantages

1. Vessels with AMS systems are exempt from needing to meet the discharge standard in the US
   – AMS by definition meets the discharge standard for 5 years

2. Owners have no liability for Lawsuit under Clean Water Act (in compliance with VGP)

3. No Ballast Exchange needed

4. Owners may use and gain experience with BWM systems without fear of penalty or detainment

5. Environmental impact (AMS > ballast exchange)
USCG TYPE APPROVAL
Type Approval under § 162-060

• IMO Type Approval only covers efficacy

• USCG Type Approval covers both design and efficacy
  – 46 CFR Subchapter F, J

• USCG Type Approval efficacy matches IMO requirements

• Testing under USCG Final Rule differs in key areas from IMO G8
## G8 Versus USCG Final Rule

<table>
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<th>IMO G8 Guidelines</th>
<th>USCG Final Rule</th>
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<tr>
<td>Test in multiple salinities</td>
<td>Testing in three salinities</td>
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<tr>
<td>• 2 salinities &gt;10 PSU difference</td>
<td>• (&gt;1, 10 – 20, 30+ psu)</td>
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<tr>
<td>Five day hold time</td>
<td>1 day maximum hold time</td>
</tr>
<tr>
<td>3 successful shipboard runs</td>
<td>5 consecutive successful, valid shipboard runs</td>
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<tr>
<td>Only successful test runs reported</td>
<td>All official tests must be reported</td>
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<tr>
<td>Allows test facilities to determine test methods</td>
<td>Mandates specific test methods</td>
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Independent Labs

• All testing for USCG Type Approval must be done by a certified Independent Laboratory
  – Certified under 46CFR 162.060-40

• Only two (2) Labs have certification
  – NSF (2012)
  – DNV (2013)

• Vendors may submit existing data under § 162.060-12 to the Independent Lab for review and use towards USCG Type Approval
USCG / UV ISSUE UPDATE
USCG UV Issue

- EPA ETV Protocol incorporated into Final Rule requires use of CMFDA/FDA dual stain technique immediately on discharge

- Stain measures respiration potential of cell and cell wall integrity

- UV affects DNA and prevents reproduction, does not cease cellular activity

- MPN Assay establishes productivity of cell
USCG UV Issue (cont.)

• ETV Tech Panel reconvened to discuss implementation of MPN under section 5.4.8 of the ETV Protocol

• USCG, EPA, Vendors, Test Facilities, & key stakeholders are on the Panel
  – Validation of MPN underway

• Panel latest meeting Jan 14-15, 2014
USCG UV Issue (cont.)

• Alternately, USCG allows vendors to request variance from rule required tests

• Variance requests must be submitted to USCG prior to commencing testing

• Variance may allow path forward for UV systems prior to changes to ETV
USCG Type Approval Testing

• Hyde Marine entered into negotiations with NSF Laboratories in 2012 for testing

• Due to UV-specific issues with the ETV Protocol, NSF indicated inability to appropriately test the Hyde GUARDIAN

• Hyde Marine entered into agreement with DNV IL for testing in 2014
LEAVE NOTHING BUT YOUR WAKE

- Headquarters
- Agents
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