The Status of California’s Ballast Water Performance Standards and an Update on Available Ballast Water Treatment Technology

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Prevention First
Preventing the Spread of Invasive Species

“An ounce of prevention is worth a pound of cure.”
Prevention First from California Legislation

- **2003 Marine Invasive Species Act**
  “...move the state expeditiously toward the elimination of the discharge of nonindigenous species into the waters of the state..., based on the best available technology economically achievable.”

- **2006 Coastal Ecosystems Protection Act**
  - Standards and implementation schedule set in statute
  - Requires the review of available technology
# Performance Standards

<table>
<thead>
<tr>
<th>Organism Size Class</th>
<th>California</th>
<th>IMO Regulation D-2/ U.S. Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisms greater than 50 µm in minimum dimension</td>
<td>No detectable living organisms</td>
<td>&lt; 10 viable organisms per cubic meter</td>
</tr>
<tr>
<td>Organisms 10 – 50 µm in minimum dimension</td>
<td>&lt; 0.01 living organisms per ml</td>
<td>&lt; 10 viable organisms per ml</td>
</tr>
<tr>
<td>Living organisms less than 10 µm in minimum dimension</td>
<td>&lt; 10³ bacteria/100 ml &lt; 10⁴ viruses/100 ml</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>&lt; 126 cfu/100 ml</td>
<td>&lt; 250 cfu/100 ml</td>
</tr>
<tr>
<td>Intestinal enterococci</td>
<td>&lt; 33 cfu/100 ml</td>
<td>&lt; 100 cfu/100 ml</td>
</tr>
<tr>
<td>Toxicogenic <em>Vibrio cholerae</em> (O1 &amp; O139)</td>
<td>&lt; 1 cfu/100 ml or &lt; 1 cfu/gram wet weight</td>
<td>&lt; 1 cfu/100 ml or &lt; 1 cfu/gram wet weight</td>
</tr>
<tr>
<td></td>
<td>zoological samples</td>
<td>zooplankton samples</td>
</tr>
</tbody>
</table>

**Implementation Schedule?**
Review of Treatment Technology

- Report mandated **18 months prior** to the scheduled implementation date

- Consultation with the
  - State Water Resources Control Board
  - United States Coast Guard, and
  - Advisory panel (CADFW, EPA, shipping, port, conservation, fishing, aquaculture, agriculture, and public water agencies)
Submit to the Legislature a review of currently available technologies for ballast water treatment systems

- efficacy
- availability
- environmental impacts, including the effect on water quality

If technologies are unavailable, the commission shall include in that review an assessment of why the technologies are unavailable.
Review of Shore-Based Treatment Technology

- Reports from 2013 and 2014
- No shore-based systems are available
- Technology feasibility report
Shore-based systems are allowed but not required

Research and development focus is on the use of shipboard systems
Review of Shipboard Treatment Technology

- Reports from 2013 and 2014
- Systems are most likely capable of complying with other water quality/environmental regulations
- Systems can be purchased
- No shipboard systems can be proven to meet the CA Ballast Water Standards
Assessment

Why is Shipboard Technology not Available?

- Data(?)
  - Discharge data versus trial data
  - Not sampling discharged ballast water

- Methods of sample analysis are unavailable for 3 of the 7 organisms classes
  - Organisms 10 – 50 Microns in Minimum Dimension
  - Total Living Bacteria
  - Total Living Viruses
## Result of the Lack of Available Treatment Technology

Performance Implementation Schedule Delayed

<table>
<thead>
<tr>
<th>Ballast Water Capacity of Vessel</th>
<th>Standards apply to new vessels in this size class constructed on or after</th>
<th>Standards apply to all other vessels in this size class beginning in</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1500 metric tons</td>
<td>2016</td>
<td>2018</td>
</tr>
<tr>
<td>1500 – 5000 metric tons</td>
<td>2016</td>
<td>2016</td>
</tr>
<tr>
<td>&gt; 5000 metric tons</td>
<td>2016</td>
<td>2018</td>
</tr>
</tbody>
</table>
Questions

- Shore-based treatment technology Feasibility report?
- How are shipboard treatment systems performing?
We Need Time

- Get results from shore-based feasibility report
- Collect data from shipboard systems
Questions?

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