

The Great Lakes Fleet Installing Ballast Water Treatment Systems

Presented By:



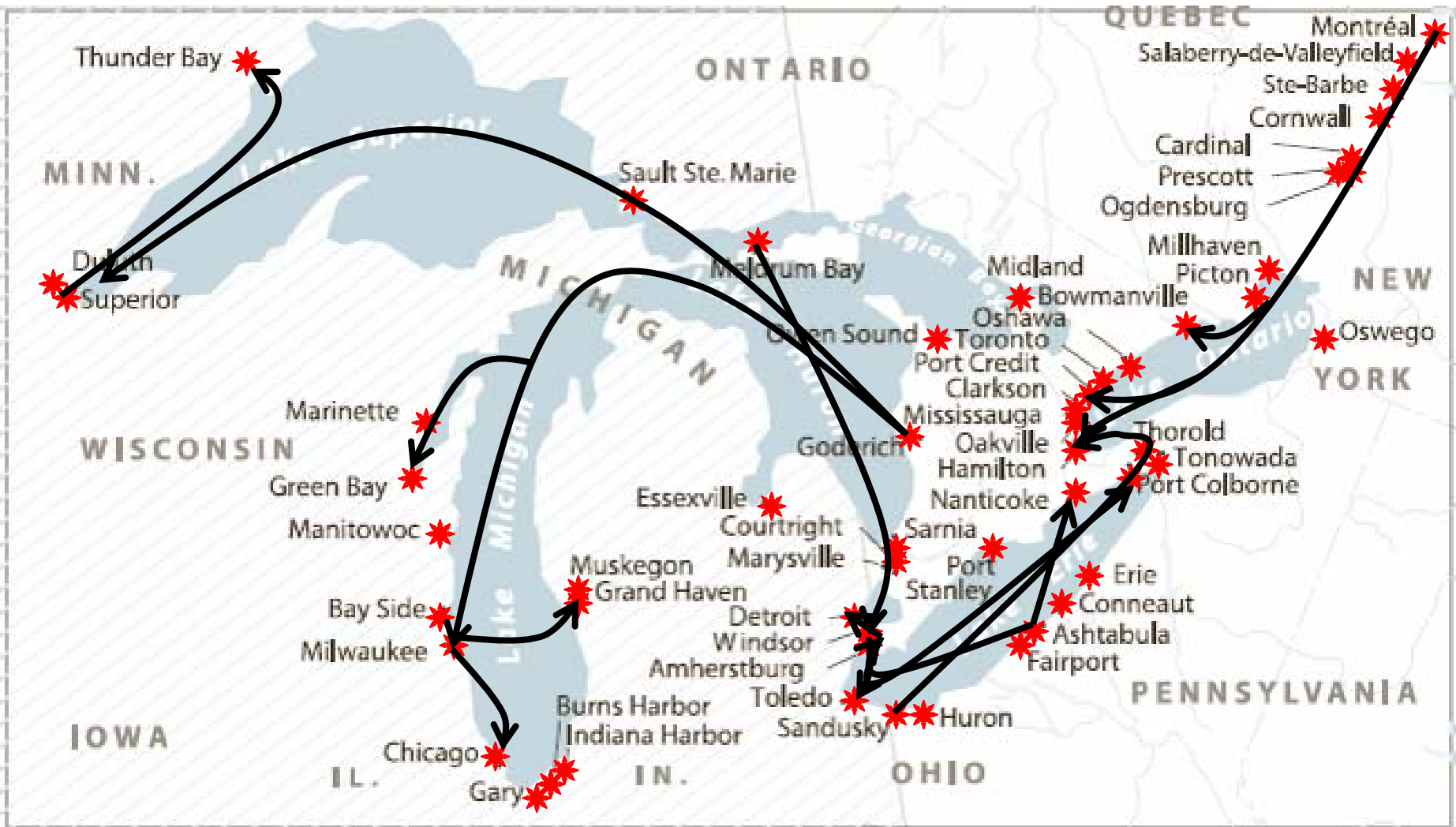
September 24, 2009
Westin Detroit Metropolitan Airport

Seaway Marine Transport

- Operates 30 vessels engaged primarily in trans-border (Canada-U.S.) trade routes throughout the Great Lakes.
- Moves 40 million tonnes of cargo each year, over half requiring navigation through the St. Lawrence Seaway System.
- Voyages average 4 to 5 days from unload to unload. Some are less than 2 days.
- Our vessels are typical of most operating on the Great Lakes and in the St. Lawrence.

Great Lakes Trade

Short trips with quick load & unload times



What Must A Ballast Solution Do?

- Clean 4,000 to 5,000 tonnes per hour – equivalent of 1.5 Olympic sized swimming pools per hour.
- Must fit into the space limitations of an existing engine room.
- Must work within the existing generator power capability.
- Must work very quickly for short trips.
- Must work in fresh water.
- Must guarantee no unforeseen environmental consequences.
- Must be safe for crews and shore personnel.

Ballast Treatment Systems

System Types and Options

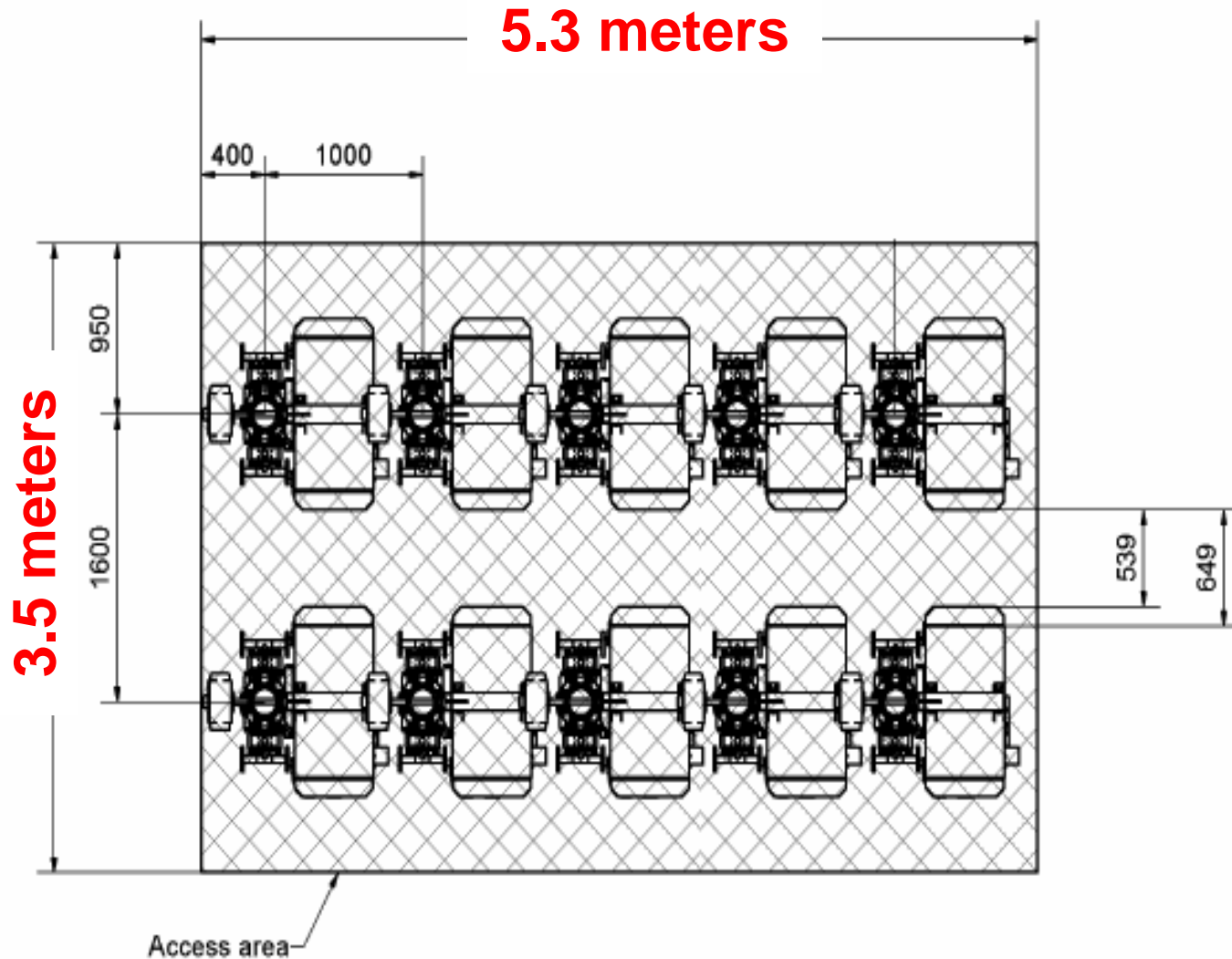
Physical Treatment

- Ultrasonic
- Cavitation
- Gas Injection
- Deoxygenation
- UV

Chemical Treatment

- Chlorination
- Electrochlorination
- Ozonation
- Biocide

1. Physical Treatment System Footprint Example



The Engine Room

A typical engine room – space at a premium.



The Engine Room

A typical engine room – space at a premium.



Ballast Pump



2. Chemical Treatment

- Injection solutions should require less space.
- Biocide must:
 - Dispense thoroughly
 - Kill quickly & efficiently
 - Disappear / become benign almost immediately
 - Have no long term environmental consequences to fresh water
 - Have no ill effects to crew or shore personnel
- There is no proven biocide to date

What We Have Been Reading

- “It’s not that hard to kill things . . . you can heat them up, crush them, pressurize them, put a chemical on them. We think this is a problem that can be solved in a very economical fashion.”
- “Installation and operating costs are estimated to be \$250,000 U.S. per vessel in order to comply with Phase-One BWDS.”

Facts As We Know Them

- There is no physical treatment system that can meet proposed regulations.
- We are being quoted about €2.0 million for 1 vessel solution that meets IMO standards.
- Installation costs could equal that amount again.
- There is no biocide solution that we know of that meets the necessary criteria.