



FEDNAV

DELIVERING A HIGHER STANDARD





FEDNAV'S EXPERIENCE WITH BWTS IN THE GREAT LAKES

ICAIS - Winnipeg

2016-04-12



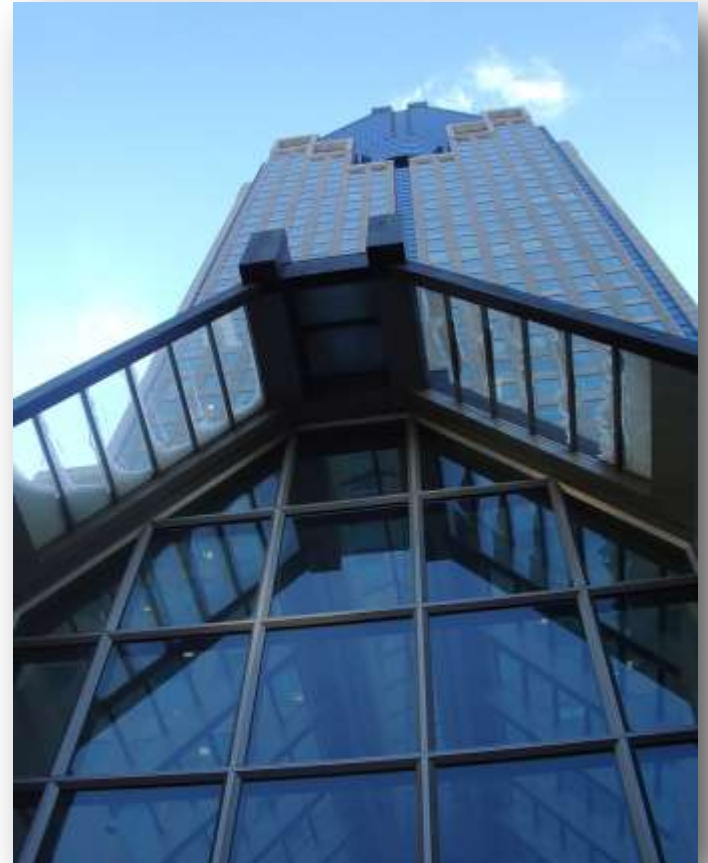
PLAN

- > Fednav
- > Regulations, Impediments and Reality
- > Decision
- > Approval
- > What's Next?
- > Conclusion



FEDNAV

- › Incorporated in 1944
- › Privately held
- › Headquartered in Montreal
- › Largest Canadian dry-cargo shipping group
- › Leaders in international Handysize/Supramax bulk carrier ownership and operation





OWNED FLEET

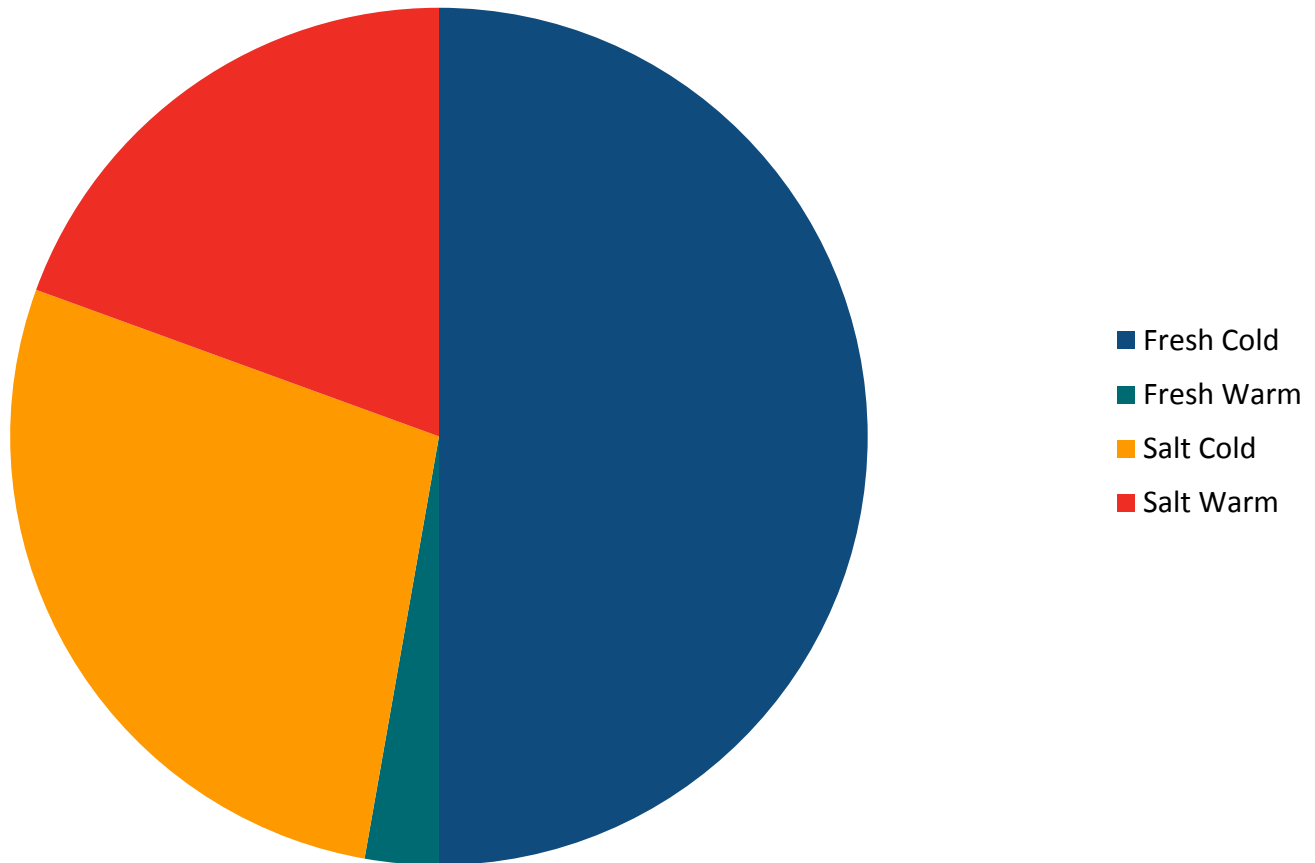
Ship Type and Size	Current	On Order
Handysize Lakers (27,500 to 37,000 DWT)	39	11
Handysize Non-Lakers (37,000 DWT)	9	—
Supramaxes / Ultramaxers (53,500 to 63,000 DWT)	12	4
Ice-breaking Bulk Carriers (25,000 to 32,000 DWT)	3	—
TOTAL OPERATED BY FEDNAV *	63	15

* An additional 20 to 40 bulk carriers on short-term or voyage charter



360 DIFFERENT PORTS VISITED EACH YEAR

Top 10% of ports visited

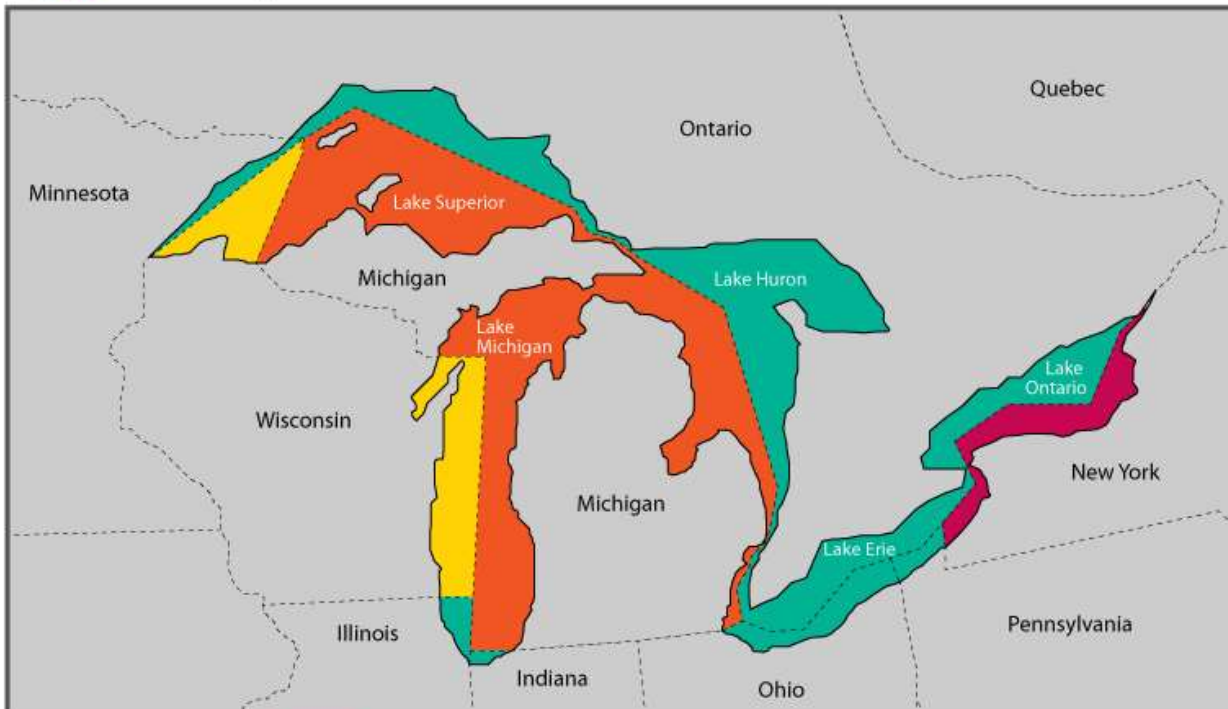




REGULATIONS IN THE GREAT LAKES: CHAOS IN 2008



BALLAST WATER TREATMENT STANDARDS AND SCHEDULE



- IMO Performance Standard and Schedule
- IMO Performance Standard, Faster Implementation
- 100x IMO Performance Standard (2012); 1000x IMO Performance Standard 2013
- State Specific Performance Standard

REGULATIONS IN THE GREAT LAKES: NOW

- > Some harmonization under the EPA's Vessel General Permit
- > 3 specific permits
 - > Michigan
 - > Minnesota
 - > Wisconsin
- > Specific requirements, e.g.:
 - > Saltwater
 - > Chemicals
- > AND: US Court of Appeals ruling: uncertainty



REGULATIONS: TIMELINE

> IMO

- › Will enter into force 1 year after ratification of convention
- › After entry into force: Installation at 1st renewal survey

> USCG

- › Vessels constructed after December 1, 2013: on delivery *
- › Existing vessels: 1st scheduled drydocking after January 1, 2016

> EPA

- › Same as USCG **

> CANADA

- › Same as IMO

* Extension letters for two years are granted by USCG, as systems are not yet approved

** The EPA will not grant extension letters, but will offer “special consideration” to shipowners before systems are approved



REGULATIONS: STANDARD OF DISCHARGE

- > Same everywhere
 - > IMO
 - > USCG
 - > EPA
 - > US states
 - > Canada

Organism category	Discharge standards
Organisms $10_{\mu\text{m}} \sim 50_{\mu\text{m}}$	< 10 Ind/ml
Organisms $>50_{\mu\text{m}}$	< 10 Ind/ml
Toxicogenic vibrio Cholerae (01,139)	< 1 cfu/100 ml
Escherichia Coli (E. Coli)	<250 cfu/100 ml
Intestinal Enterococci	<100 cfu/100 ml

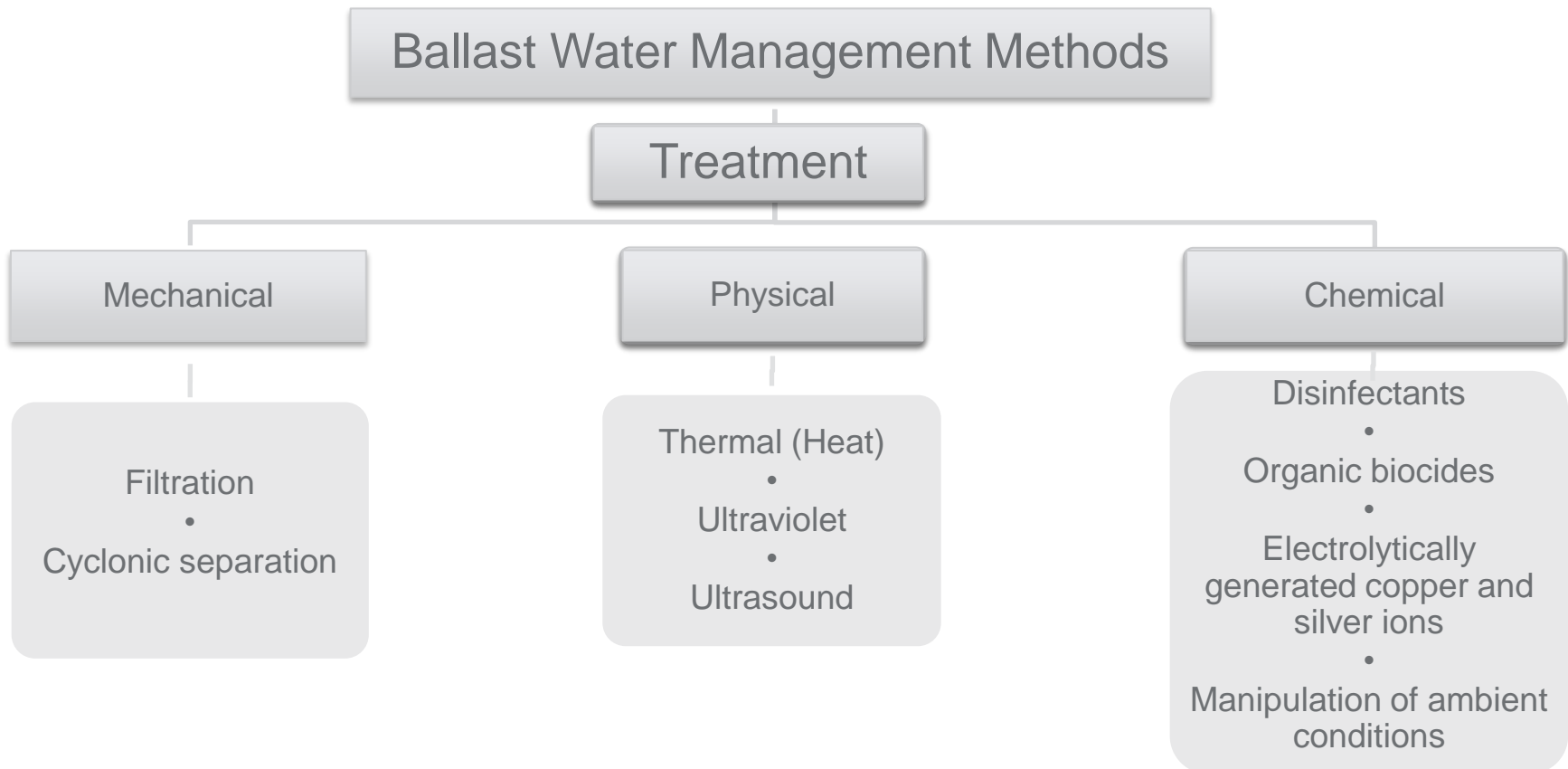


SYSTEMS AVAILABLE

> IMO TYPE-APPROVED:	57
> USCG TYPE-APPROVED:	0
> USCG AMS (5-year use):	56
> USCG AMS for fresh water:	12
> BWTS Manufacturers in formal process with USCG:	16
> Letters of Intent from BWTS Manufacturers	33



BWTS METHODS





INNOVATIVE SOLUTION FOR THE GREAT LAKES

- > All about a **process**
- > Began 10 years ago
- > Multiple testing
 - > *Federal Yukon*
 - > *Federal Welland*
 - > *Federal Venture*
- > Millions of dollars

Copper ions

Electrodialytic Disinfectant

Chlorination



FEDERAL YUKON – 2001



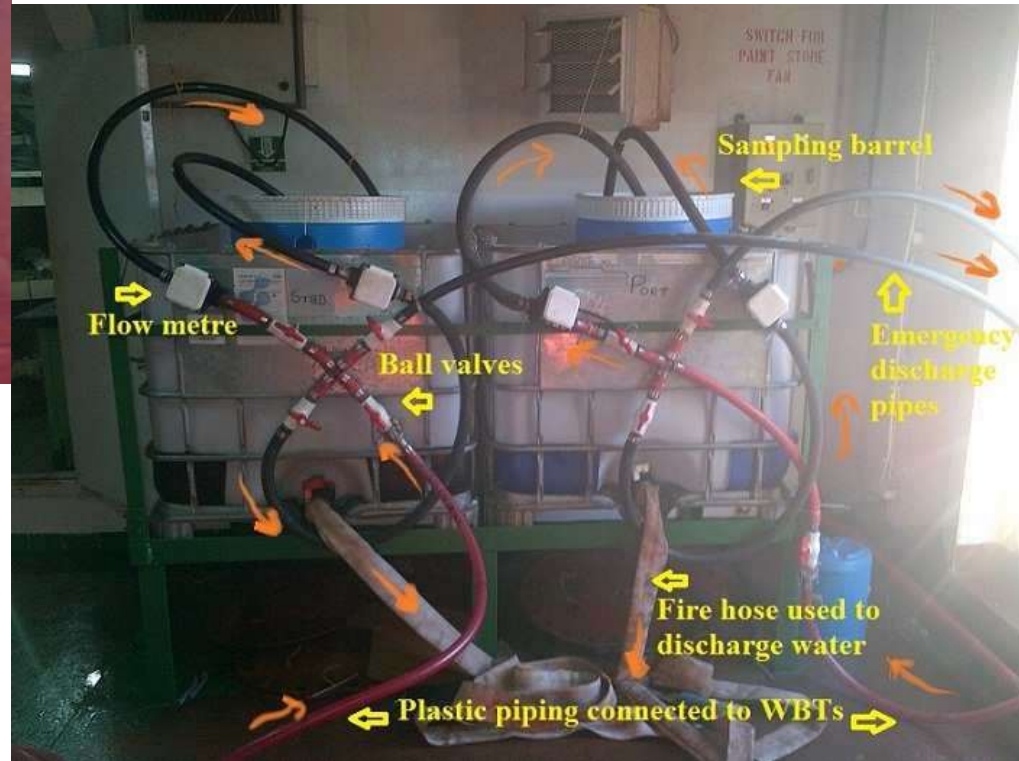
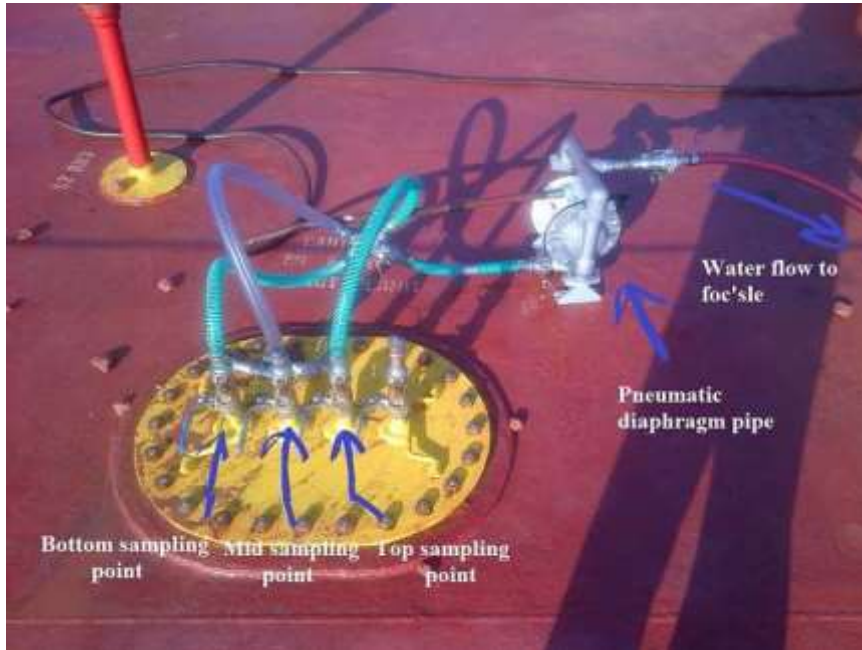


FEDERAL WELLAND – 2005





FEDERAL VENTURE – 2012





FEDERAL BISCAY - 2015



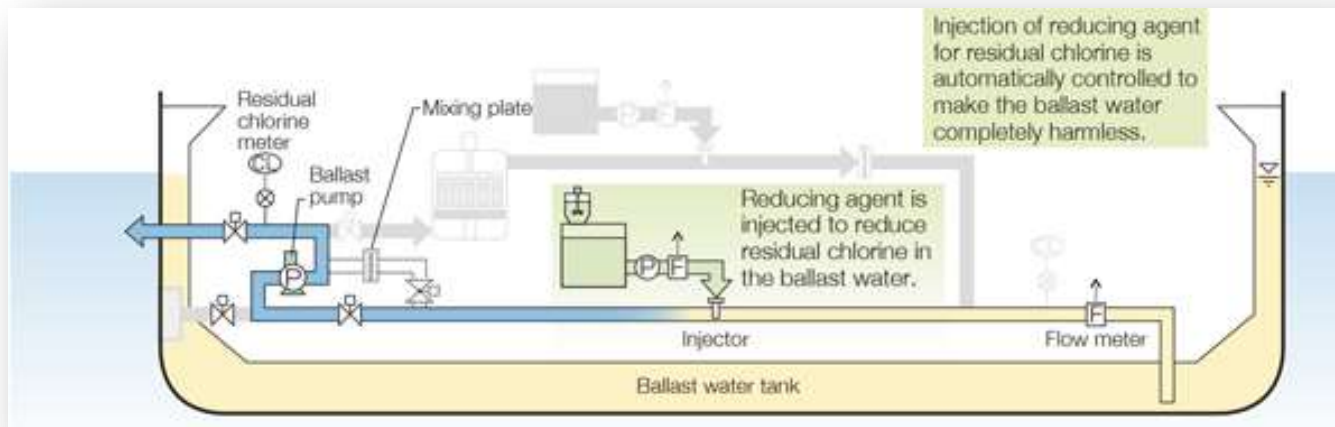
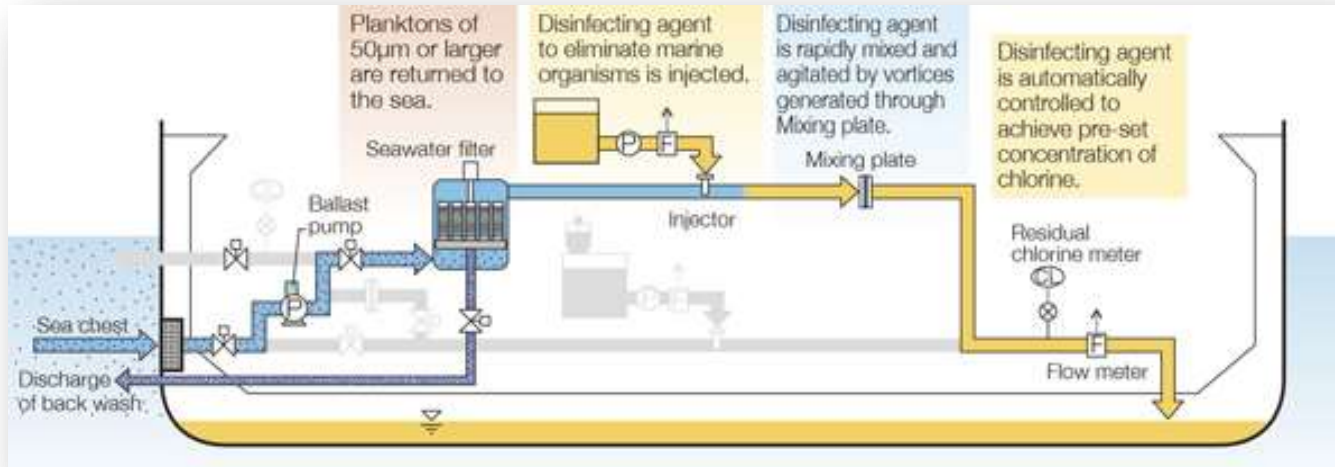


JFE BALLAST ACE

- > Filtration and Chemical injection Ballast Water Treatment System
- > Type-approved by Japan for salt/brackish (2011) and fresh (2015) water
- > Filtration
- > Chlorination
 - > Disinfecting agent: sodium hypochlorite (liquid)
 - > Reducing agent: sodium sulphite (powder)
- > Safe for tank coatings



OVERVIEW OF THE SYSTEM





INSTALLATION TIMELINE

October 2015

- › Delivery of *Federal Biscay*

January to September 2016

- › Delivery of 6 C-Class lakers

January and May 2016

- › Installation on 2 Supramax

- › Installation on 5 B-Class lakers, pending USCG approval



APPROVAL TIMELINE





APPROVAL CHALLENGES

- › Cost
- › Water quality at testing sites
- › Type approval vs. BWTS modification
- › Type approval status vs. AMS status
- › Discharge standard
- › State regulations



CONCLUSION

- > This is a solution for Fednav, not necessarily for others
- > We are taking a calculated risk, by
 - > Moving before regulations
 - > Installing a non-approved system
- > The next steps are:
 - > USCG approval
 - > Installation on newbuildings
 - > Retrofit existing vessels



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