BALLAST WATER CONTROL AND MANAGEMENT

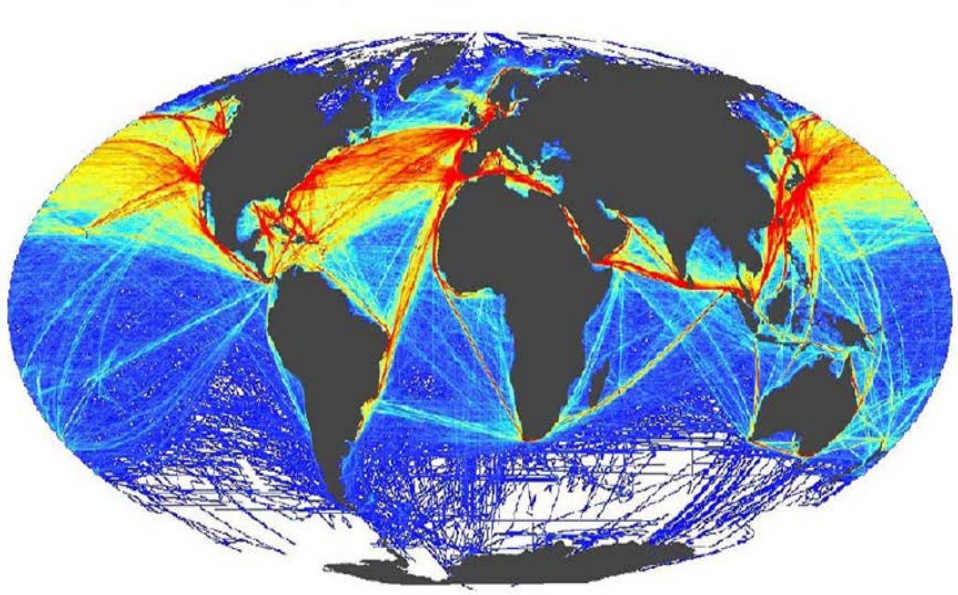
Canada Update (Pacific)

Name of Presenter: Raman Bhalla (PSCO)

Transport Canada Vancouver (British Columbia)

GLOBAL SHIPPING NETWORK

Ships have been increasing in size and speed. There are now an estimated 108,000 ships in the global fleet, moving an estimated 10.0 billion tons of ballast water around the world each year.



which is the bigger threat?

... surprisingly, it is the drop of ballast water; 10 billion tonnes of which is transferred around the world each year. Ballast water is carried by ships to provide balance and stability.

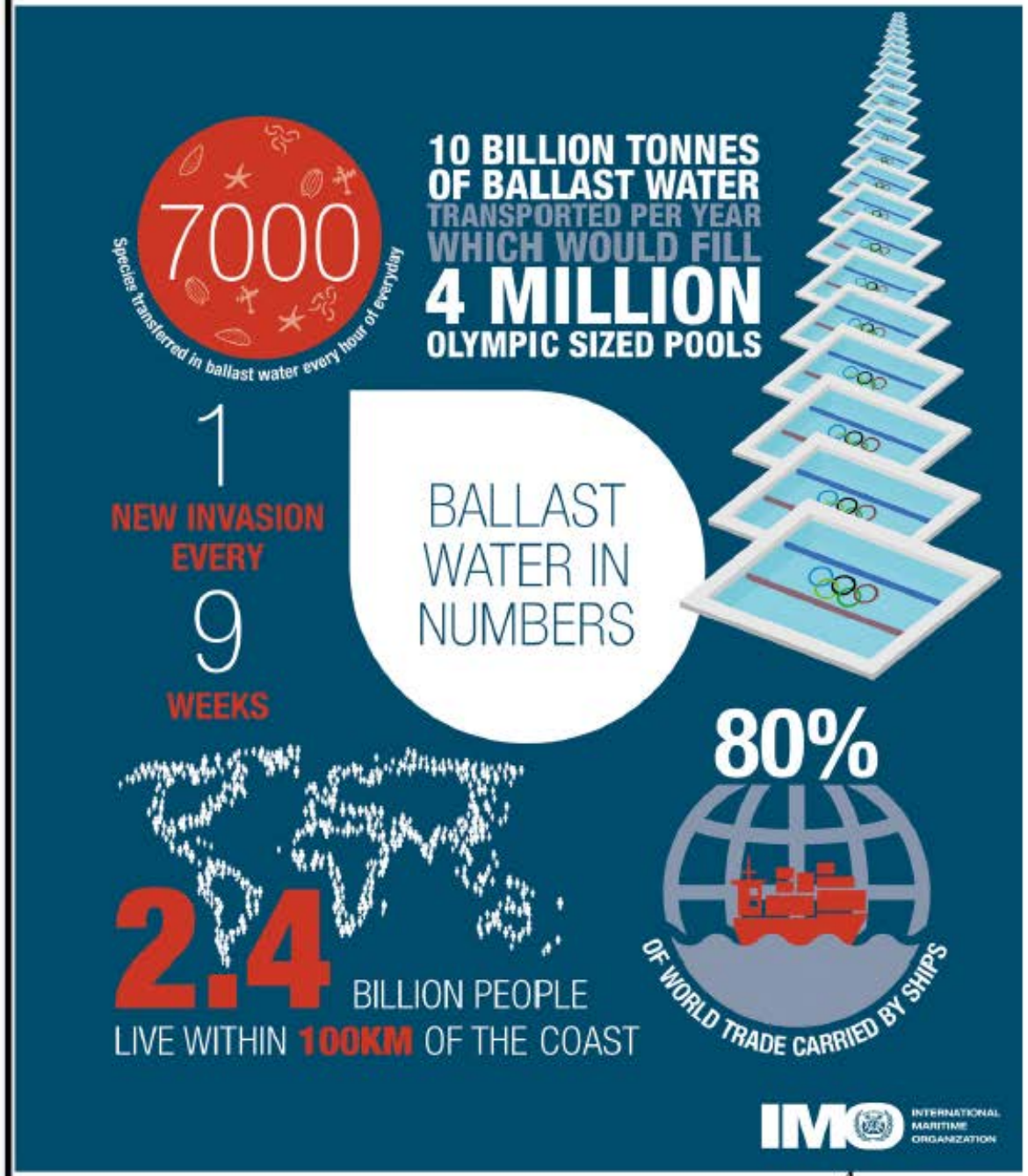
Although essential to the safe operation of ships, ballast water can contain thousands of species of marine plants and animals.

When discharged into new environments, these species may become invasive, with potentially devastating effects on the local ecology, economy and human health.

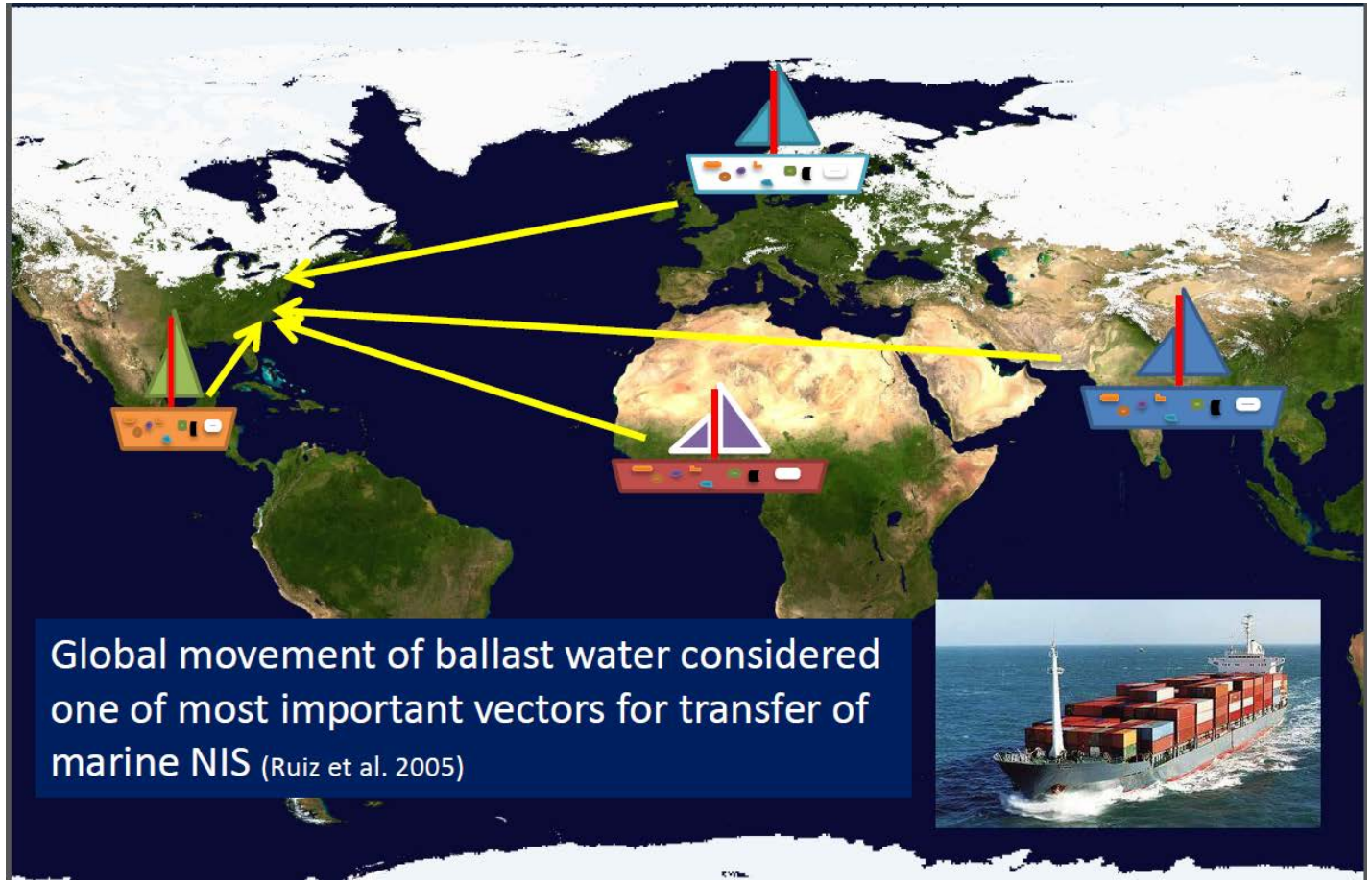
Unlike an oil spill, which can be cleaned up, the effects of marine species introductions are usually irreversible.

Ballast water transfers and invasive marine species are perhaps the biggest environmental challenge facing the global shipping industry this century.

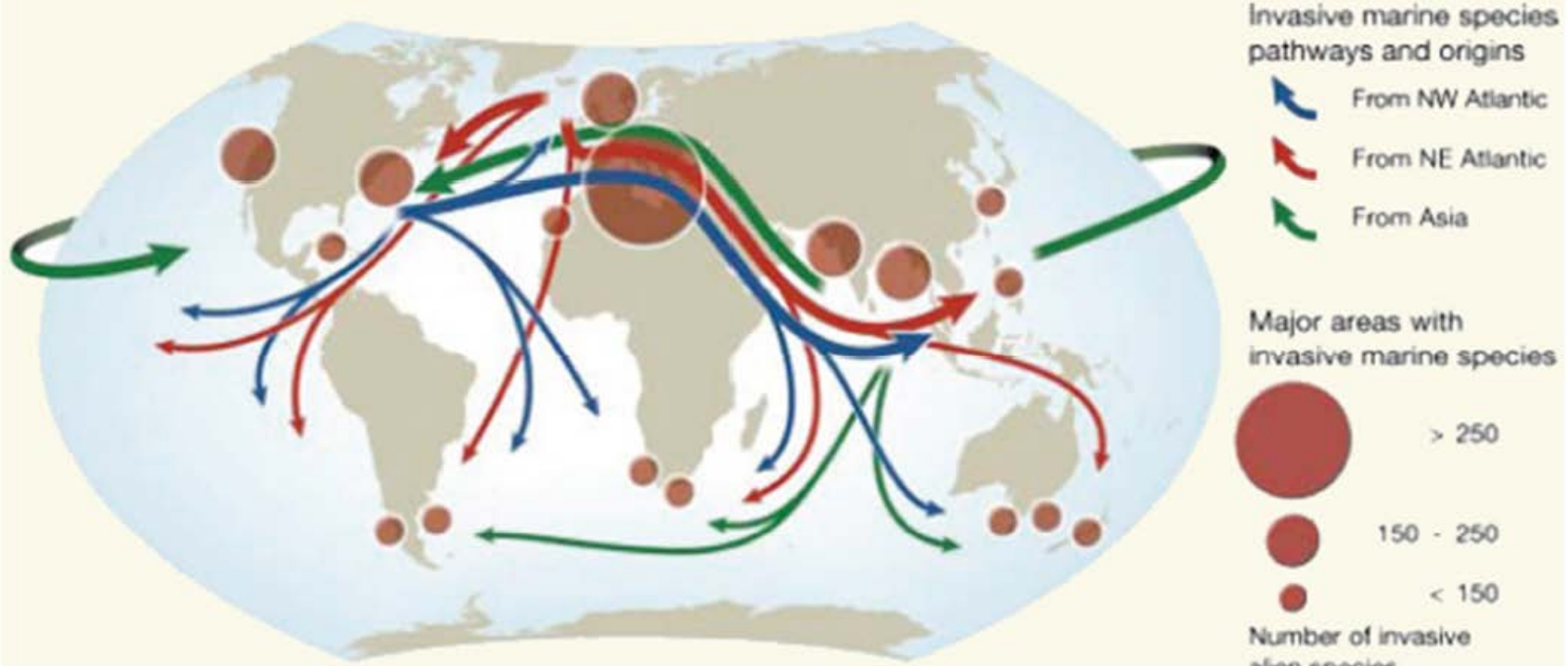
Further information:
Global Ballast Water Management Programme
International Maritime Organization, London
Fax +44 (0)20 7587 3261
Email mepcmail@imo.org
Web http://globallast.imo.org



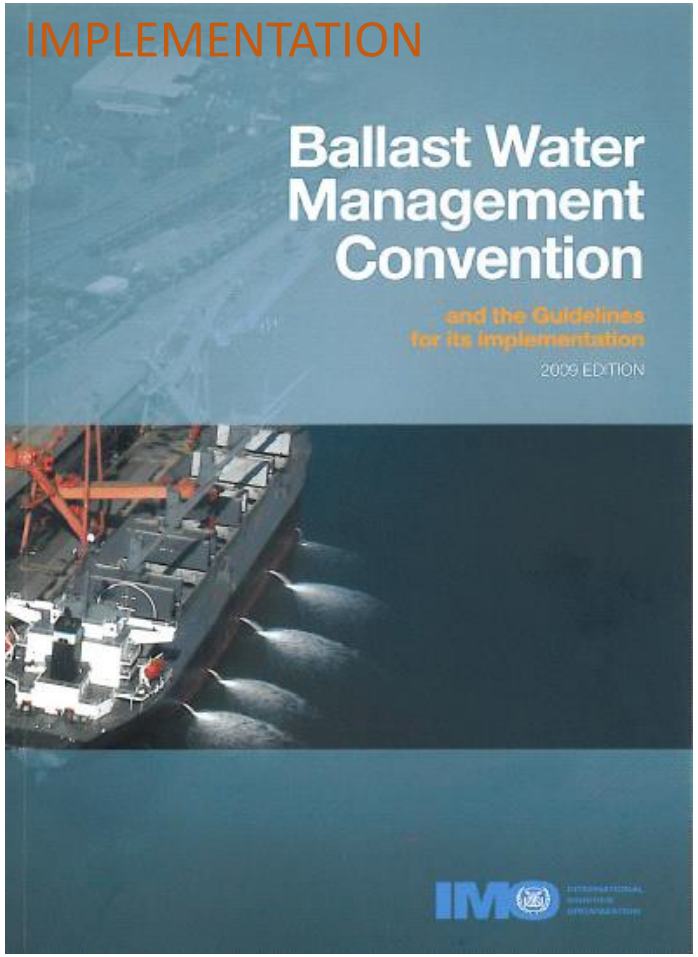
NON INDIGENOUS SPECIES INTRODUCTIONS



Major Pathways and Origins of Infestations of Invasive Species in the Marine Environment



Source: PNUMA/GRID-Arendal. 2009.



In 2004 the IMO passed “Standards for Ballast Water Discharge”

- The International Convention for the Control and Management of Ships’ Ballast Water and Sediments (BWM Convention) entered into force on 8 September 2017.
- MEPC 71 agreed on the implementation dates for the D-2 discharge standard under Regulation B-3
- The agreement ensures full global implementation by 8th September 2024

GUIDANCE ON BALLAST WATER MANAGEMENT CONVENTION 2004 UNDER Paris AND Tokyo MOU

These guidelines apply to ships as stipulated in Article 3 of the Ballast Water Management Convention

THE CONVENTION

- Main Text (Articles, Regulations & Appendices)
- Annex in 5 Sections
  - 14 Guidelines
  - 8 Resolutions
  - 63 Circulars

BWMC GUIDELINES

Guideline	Title
G1	Guidelines for Sediment Reception Facilities (MEPC.162(56))
G2	Guidelines for Ballast Water Sampling (MEPC.173(58))
G3	Guidelines for BWM Equivalent Compliance (MEPC.123(53))
G4	Guidelines for BWM and the Development of BWM Plans (MEPC.127(53))
G5	Guidelines for BW Reception Facilities (MEPC.163(56))
G6	Guidelines for BWE (MEPC.124(53))
G7	Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (MEPC.162(56))
G8	Guidelines for Approval of BWM Systems (MEPC.125(53); Revision MEPC.174(58))
G9	Procedure for Approval of BWM Systems that make use of Active Substances (MEPC.126(53); Revision MEPC.169(57))
G10	Guidelines for Approval and Oversight of Prototype BW Treatment Technology Programs (MEPC.140(54))
G11	Guidelines for BWE Design and Construction Standards (MEPC.149(55))
G12	Guidelines for Design and Construction to Facilitate Sediment Control on Ships (MEPC.209(63))
G13	Guidelines for Additional Measures Regarding BWM Including Emergency Situations (MEPC161(56))
G14	Guidelines on Designation of Areas for BWE (MEPC.151(55))
–	Guidelines for BWE in the Antarctic Treaty Area (MEPC.163(56))

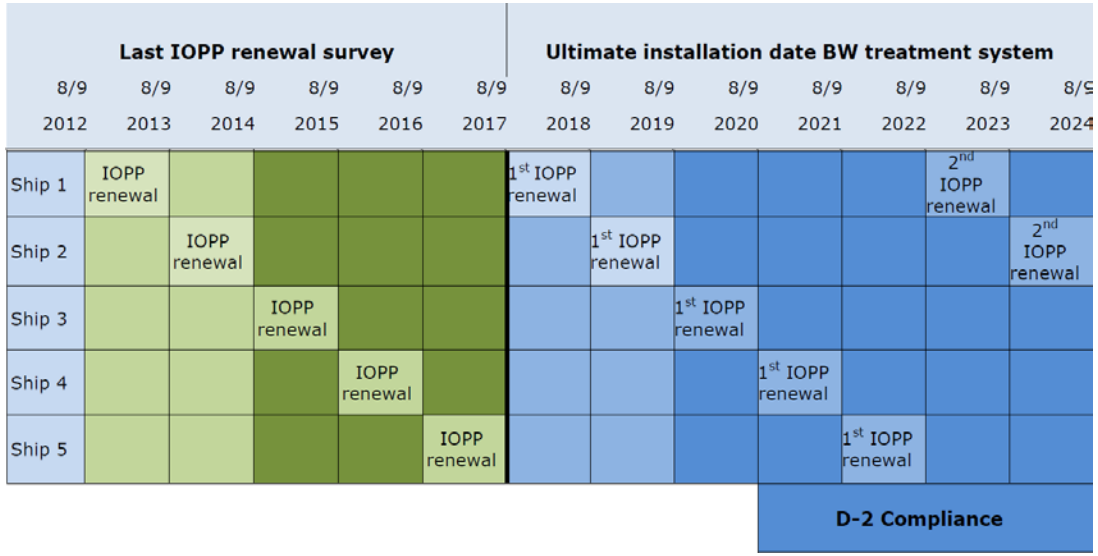
BWMC BASIC REQUIREMENTS

- Ballast Water Management Plan
- BW Record Book
- Survey and Certification
- Ballast Water Exchange
- On Board Treatment

IMPLEMENTATION SCHEDULE FOR MEETING D 2 STANDARD OF CONVENTION

Entry into Force on 8 September 2017

- Regulation D 1 standard (BW exchange) mandatory after this date
- Application of Regulation D 2 (Treatment) depends on renewal date of IOPP certificate.
- Early renewal of IOPP certificate is allowed
- Ships constructed after 8th September 2017 must comply on delivery, while existing ships in general must comply by the first IOPP renewal after 8th September 2019.
- Most ships are expected to install treatment systems and comply

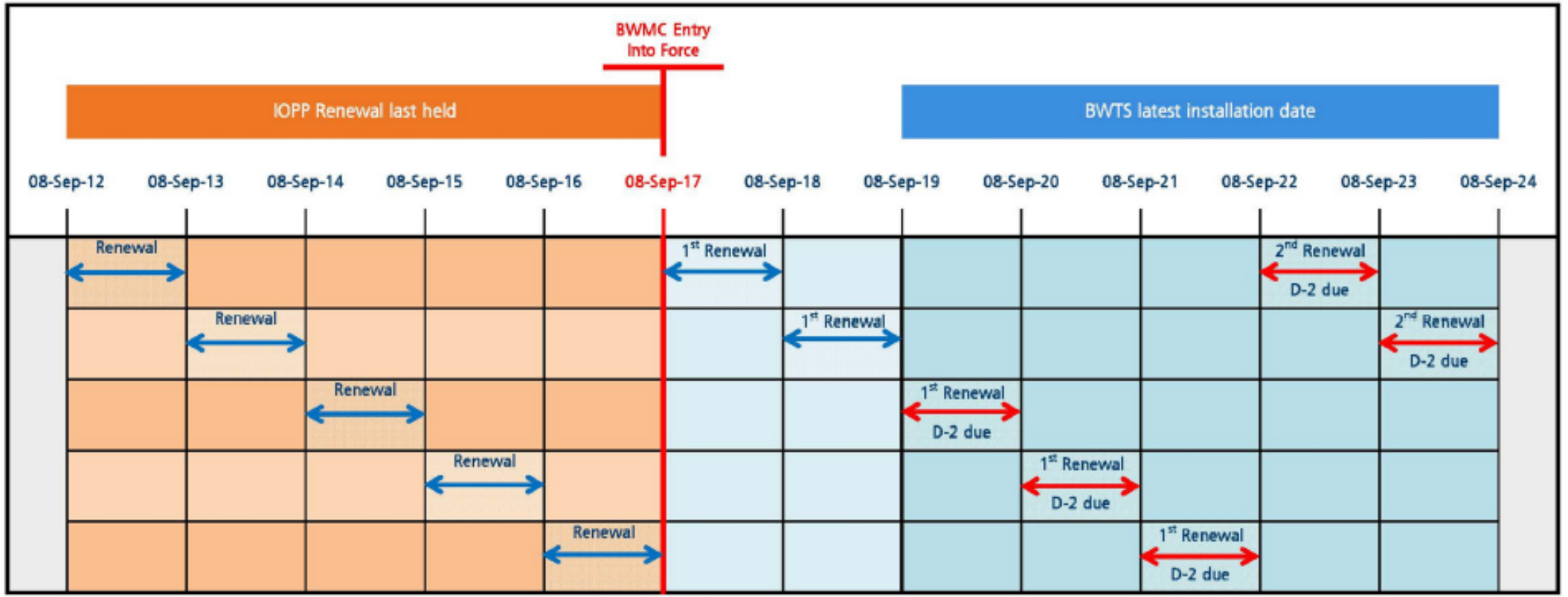


IMPLEMENTATION

- 7-year implementation schedule
- No penalization of early movers
- No requirement to replace first generation BWMS if operated / maintained despite “occasional” lack of efficiency.
- First 2 years no sanctions, warning, detention due to occasional exceedance of D 2
- Exchange is only to be carried out when possible:

  No delay or deviation is required
  - When this is not possible, no other action is required
  - (like D-2, discharge to reception facilities, other methods, etc)
  - To be recorded in BWRB

Ships Constructed (keel lay date) before 8 September 2017



Renewal	IOPP renewal survey held during this time period
D-2 due	Ballast Water treatment system installation date
⟷	Time window for IOPP Renewal Survey
⟷	Time window where IOPP Renewal Survey will trigger D-2 implementation

EXPERIENCE BUILDING ASSOCIATED WITH BWMC

Experience-Building phase

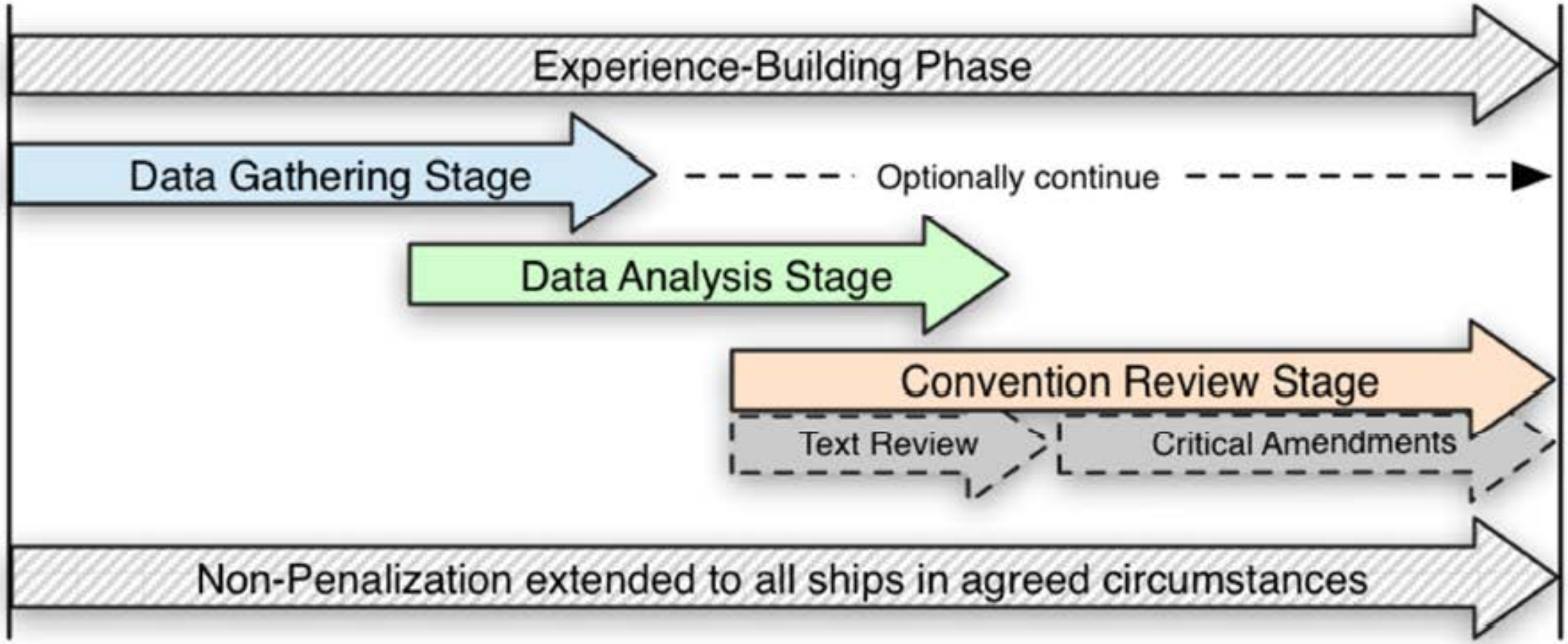
- The experience-building phase emphasizes environmental protection (rather than penalization)

  During the experience-building phase, a ship should not be penalized (sanctioned, warned, detained or excluded) solely due to an exceedance of the performance standard following use of a ballast water management system, if:

  .1 the system is approved;
  .2 the system is installed correctly;
  .3 the system has been maintained according to the manufacturer's instructions;
  .4 the ballast water management plan has been followed, including the operational instructions and manufacturer's specifications; and
  .5 either the system's self-monitoring indicates that the system is working, or the port state is advised in advance that the system is defective prior to any discharge.

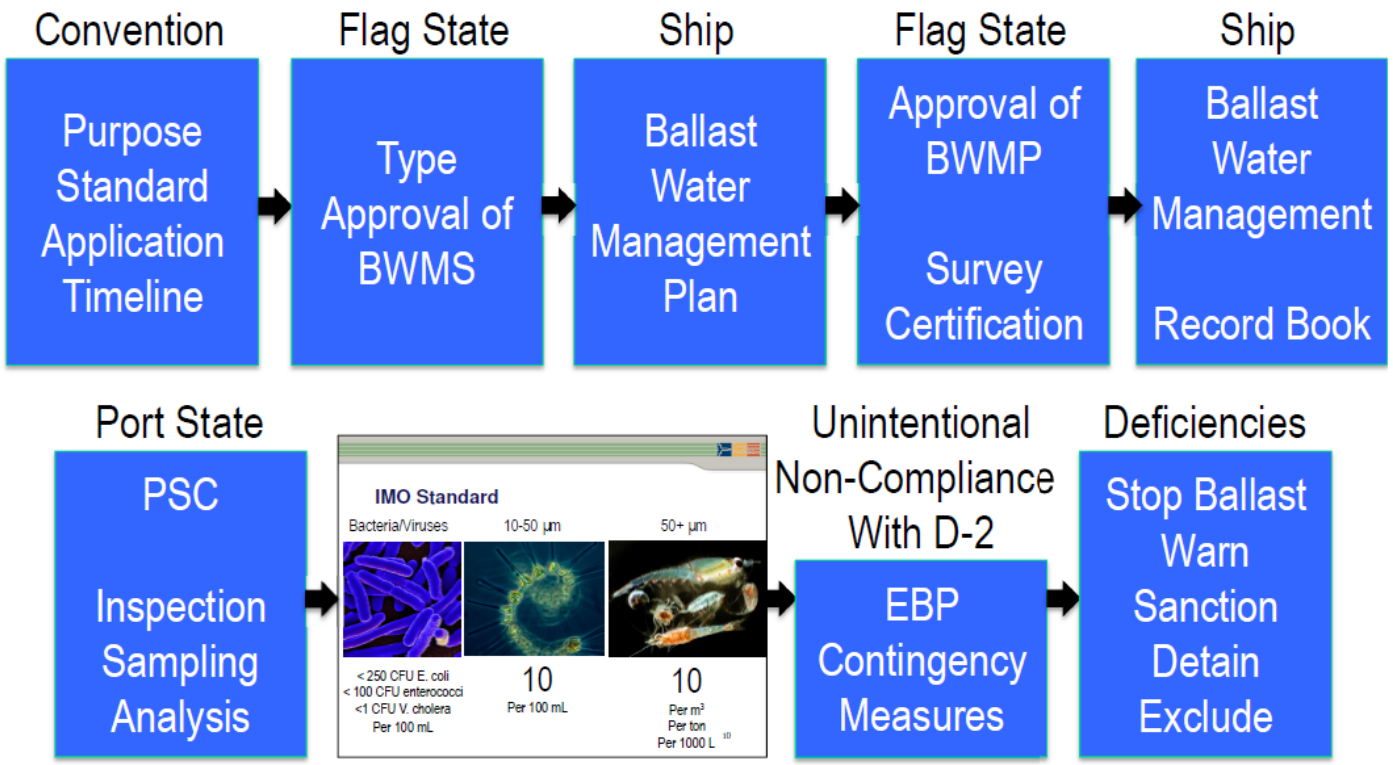
- Port states may take action to protect the environment.
  - Shipowners, port and flag states should work together in accordance with the guidance on contingency measures.

Experience-Building Phase

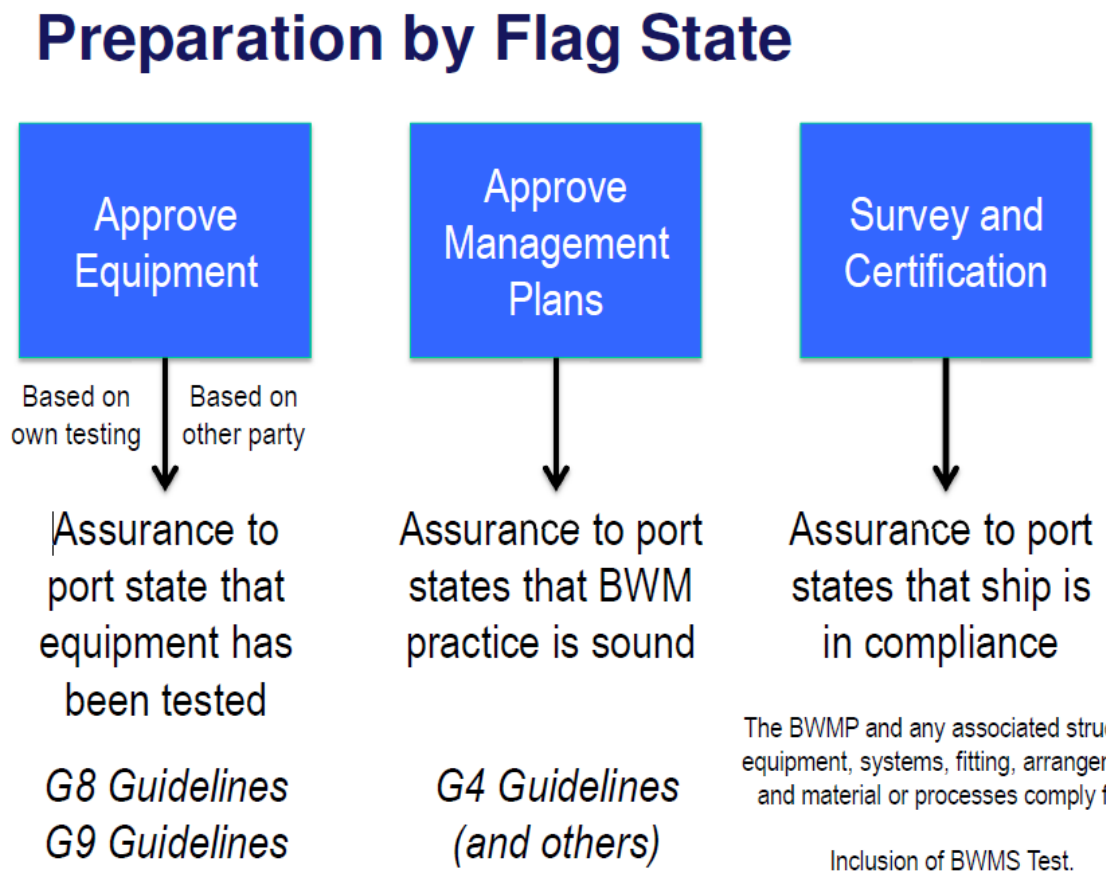


SUMMARY OF CONVENTION

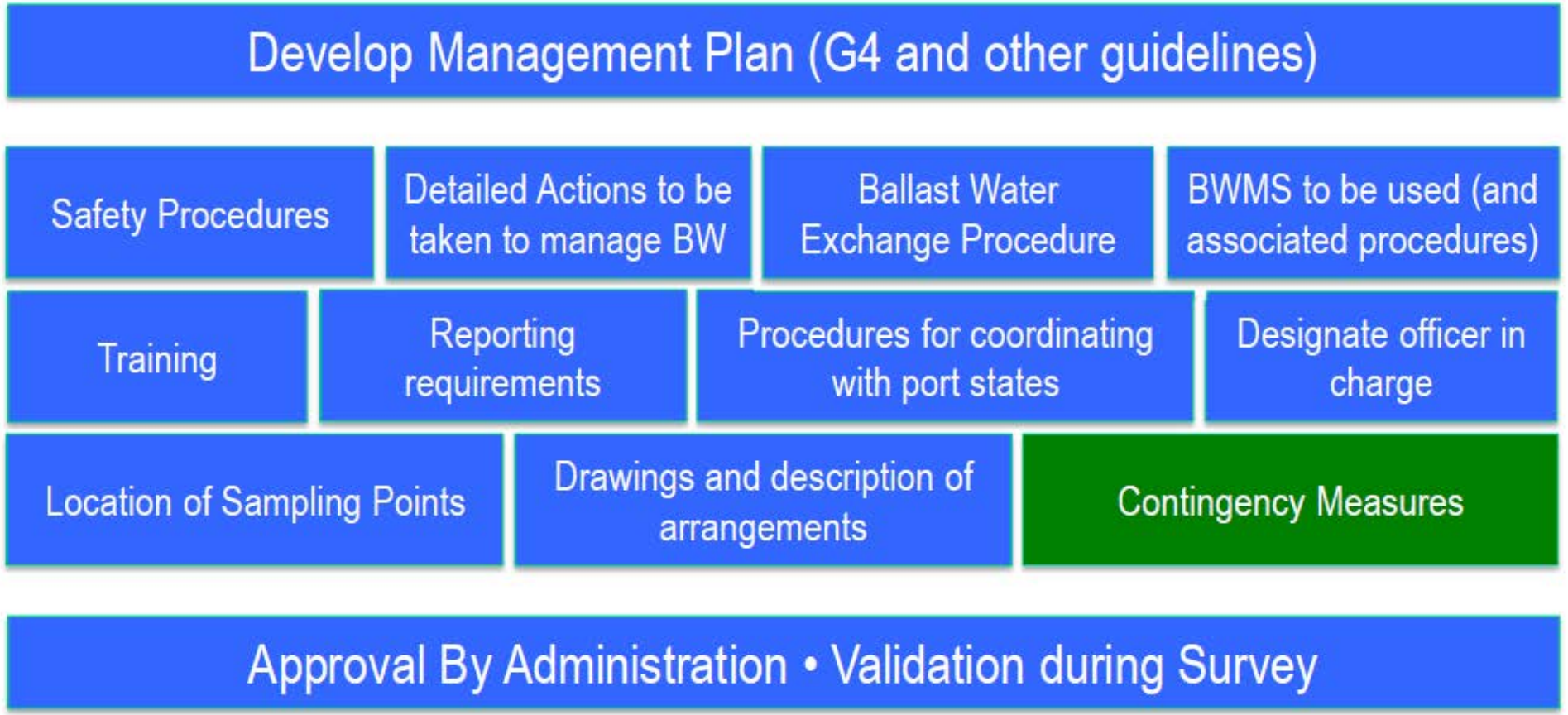
Summary of Convention Regime



PREARATION BY FLAG STATE



PREPARATION BY SHIP



WHO WE ARE ?

Transport Canada, Marine Safety

We administer national and international laws designed to:

- Ensure the safe operation, navigation, design, and maintenance of ships,
- Protection of life and property, and
- Prevention of ship source pollution

VESSELS BOUND FOR PACIFIC COAST

- Inspect all vessels with ballast.
- Target and inspect high risk vessels.
- Data collection (Ballast WaterTreatment System).
- Enforce Ballast water regulations.
- Vessel operational issue:
  - Avoid ships delays or restrictions by good ballast water management practices and communication.

PACIFIC PERSPECTIVE

- Ballast Water Regulations

- TP-13617

- Risk Assessment

- Compliance and Enforcement

COMPLIANCE

1. Reporting through TRANSPORT CANADA Regional Marine Safety Office

2. Port State Control verification:
   - (a) Salinity testing, (refractometer, electronic salinometer)
   - (b) Logs, and BW reports
   - (c) Ballast Water Management Plan

ENFORCEMENT

- Regulations,
  - Report in a timely manner.
  - Submit report form to the appropriate address as required by TP 13617.
  - Verify compliance by salinity check (30 ppt.)
- Guidelines,
  - Follow-up with the ship in cases where the ship reported that ballast water control measures were not taken.
- Enforcement tools under the CSA 2001 may be applied in certain cases, such as:
- Ship providing false information or,
- Non-compliance with provisions of the ballast water management Regulations

BALLAST WATER EXAMINATION OBJECTIVES

- Ballast tanks of ships will be subject to examination during PSC.
- Ballast water management practices will also be subject to examination.
- High risk vessel will be targeted for a visit.
- Non compliant vessels will be subject to corrective actions and close follow-up.
- In order to put the efforts at the right place, an assessment of the ballast water management practices in the Region will be done to better identify practices that are most problematic.

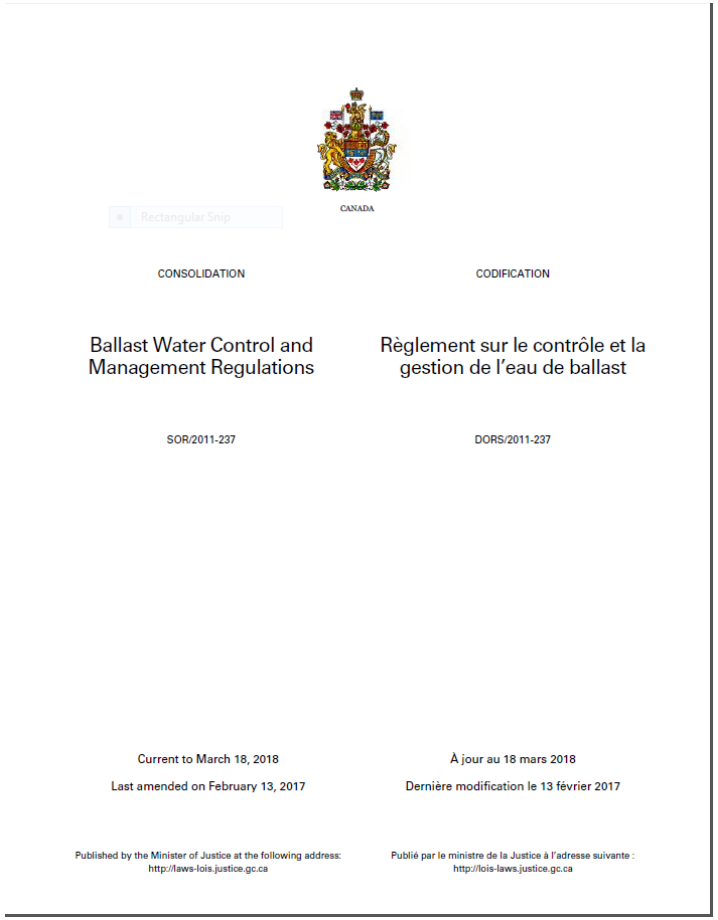
BALLAST WATER EXAMINATION CHALLENGES

- Ships to Comply with ballast water management practices including the flushing of empty ballast tanks to protect from the introduction of invasive species
- New Ballast Water reporting forms must be submitted by ships destined for Canadian ports in the manner set out in Sec. 5.2 of TP 13617, as soon as possible after the ballast water management process, by email to **pacballastwater-paceauballast@tc.gc.ca** for early analysis in order to enable early corrective action, when required
- **Communication**
  - Vessels to be properly informed
  - BWRF to be filled properly in Adobe fillable Form for easy Data Management
- Non compliant vessels will have to take corrective actions and will be subject to a close follow-up.

BALLAST WATER CONTROL and MANAGEMENT REGULATIONS

- Purpose of the ballast water regulations is to help ensure that ballast water is managed in such a manner so as to reduce the potential invasions from non-indigenous aquatic organisms and pathogens

- Transport Canada is proposing to amend the Ballast Water Control and Management Regulations to align them with the IMO's BWM Convention, which entered into force on September 8th, 2017



CANADA

CONSOLIDATION

CODIFICATION

Ballast Water Control and Management Regulations

Règlement sur le contrôle et la gestion de l'eau de ballast

SOR/2011-237

DORS/2011-237

Current to March 18, 2018

Last amended on February 13, 2017

À jour au 18 mars 2018

Dernière modification le 13 février 2017

Published by the Minister of Justice at the following address: http://laws-lois.justice.gc.ca

Publié par le ministre de la Justice à l'adresse suivante : http://lois-laws.justice.gc.ca

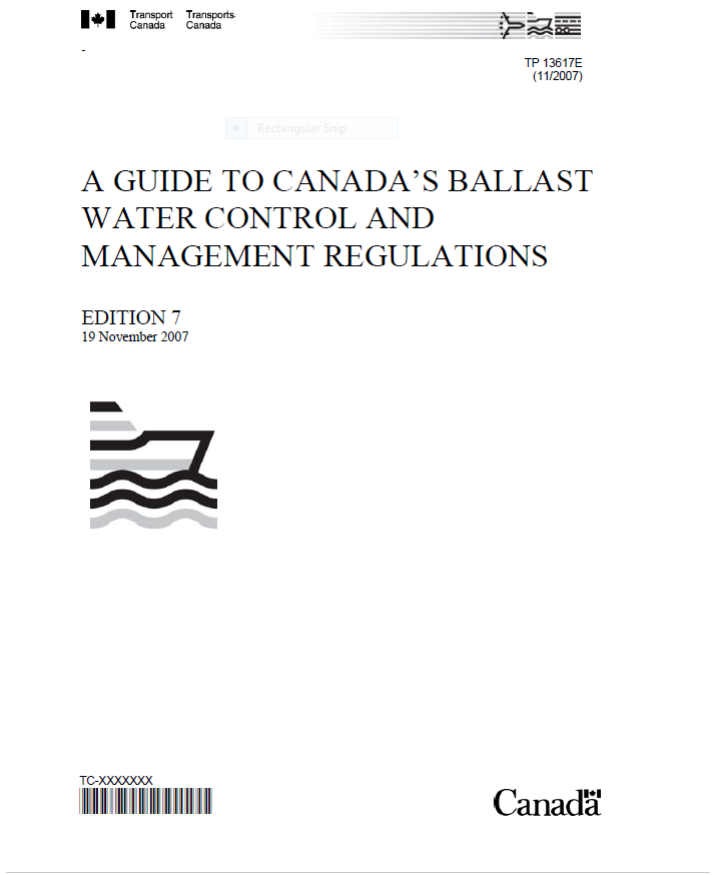
GUIDE TO CANADA'S BALLAST WATER REGULATIONS (TP 13617 E)

TP 13617 elaborates on the following:

- Preparation of Ballast Water Management Plans.
- The use of ballast water treatment systems.
- Provisions for reporting.
- Procedures and Standards when conducting Flushing/exchange (Under D 1) .

Must achieve at least:

- 95% volumetric exchange
- Pumping three times the volume (flow-through) meets the above requirement
- Salinity of at least 30 PPT or>


Transport Canada Transports Canada

TP 13617E
(11/2007)

A GUIDE TO CANADA'S BALLAST WATER CONTROL AND MANAGEMENT REGULATIONS

EDITION 7
19 November 2007

TC-XXXXXXX

Canada

(TP 13617) A GUIDE TO BALLAST WATER MANAGEMENT REGULATIONS

- TP 13617 is a Guide to the Ballast Water Management Regulations
- The Guide elaborates on the following:
  - Preparation of Ballast Water Management Plans
  - Procedures and considerations when conducting exchanges
  - The use of ballast water treatment systems
  - Provisions for reporting
  - Procedures for small pleasure craft and rescue vessels
  - NOBOB vessels

APPLICATION

Applies to: - Canadian ships everywhere, and,

- To all ships in waters under Canadian jurisdiction designed to carry ballast .

It does not apply to vessels:

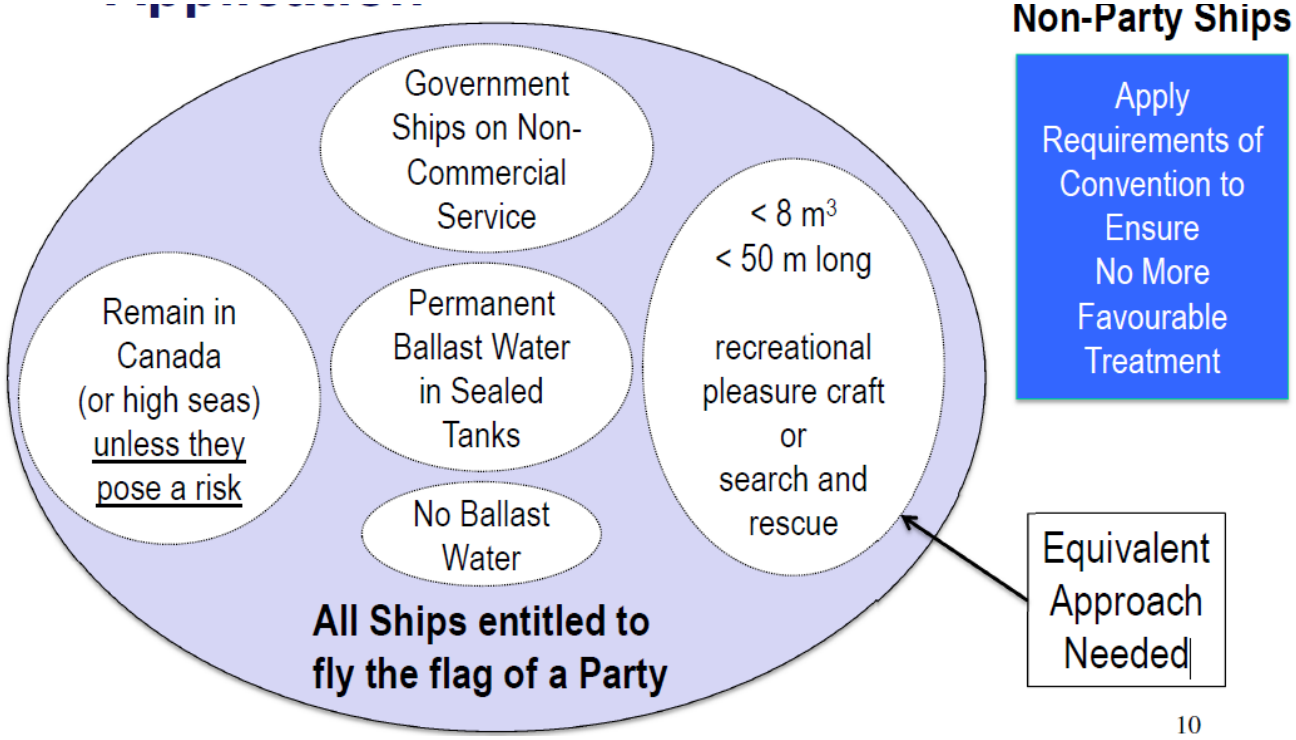
- Operated exclusively within waters under Canadian jurisdiction, and the US waters of Great Lakes

- Used in search and rescue less than 50 m length

- Pleasure craft , Max 50 m length and < 8 m^3

- Vessels that carry permanent ballast water

- Government vessels in non-commercial service



BALLAST WATER MANAGEMENT PLAN

- Required to be carried on board
- The plan must contain at least the following . . .
    - Detailed description of BW management processes
    - Detailed description of the crew BW procedures
    - Safety procedures with respect to BW management
    - Detailed description of disposal of sediment
    - Coordinating procedures with Canadian authorities
    - Design specifications of the Ballast Water system
    - Specifics for treatment, flow through or exchange
    - Responsible officer.
    - Ballast Water reporting form and methods of
    - Operational limits e.g. wave height for various speed

EXCEPTIONS / EXEMPTIONS

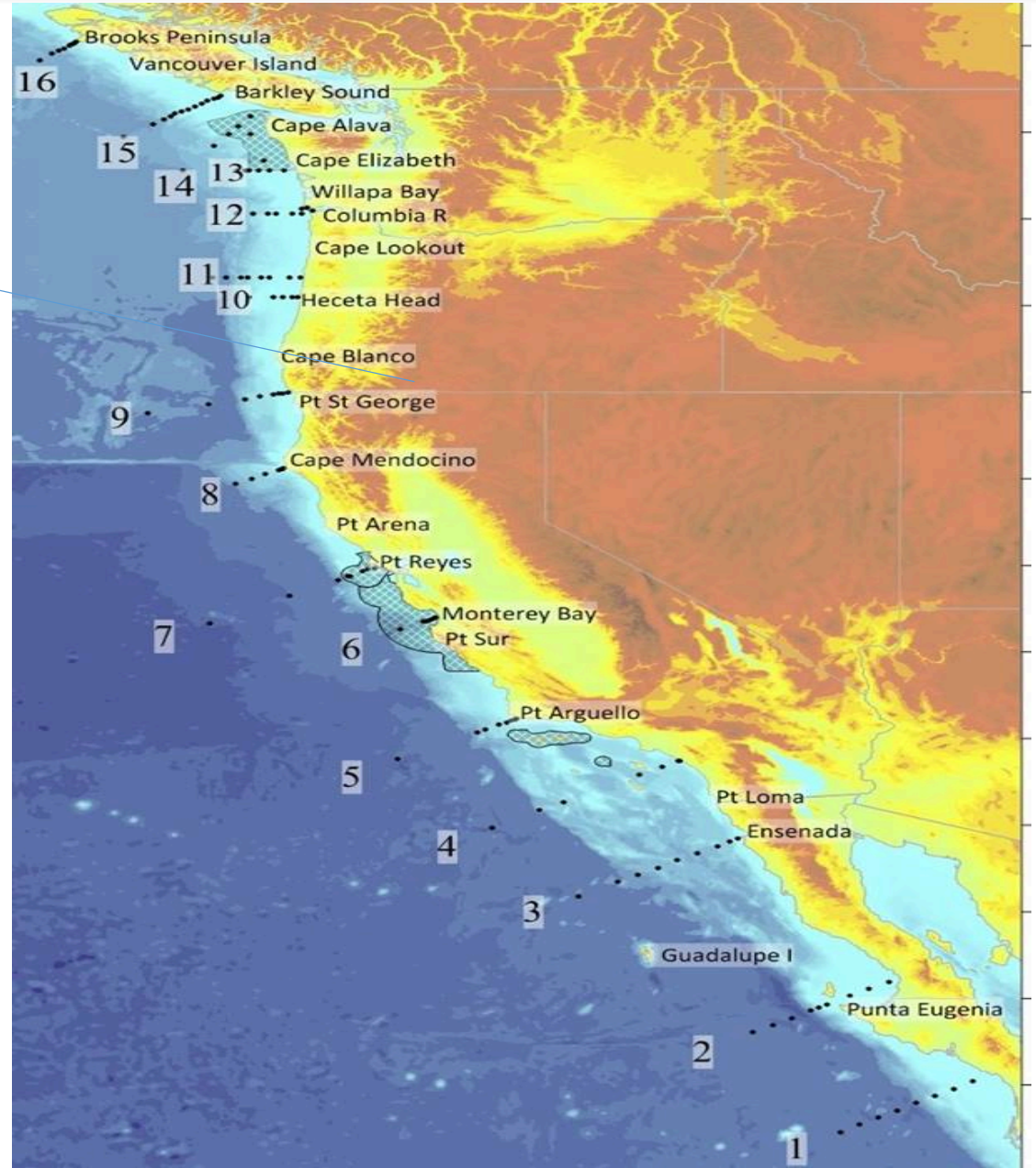
- The ship operate exclusively between ports, offshore terminals or anchorage areas situated on the west coast of North America **north of Cape Blanco**

Exceptions:

- Emergency situations, safety of ship and crew, discharge in same location as uptake

Exemptions:

- Ships on voyage or operating exclusively between specific ports
- For up to 5 years, subject to intermediate review
- Based on G7, Guidelines for Risk Assessment
- To be communicated to IMO
- To be recorded in the BW Record Book


Brooks Peninsula
Vancouver Island
Barkley Sound
Cape Alava
Cape Elizabeth
Willapa Bay
Columbia R
Cape Lookout
Heceta Head
Cape Blanco
Pt St George
Cape Mendocino
Pt Arena
Pt Reyes
Monterey Bay
Pt Sur
Pt Arguello
Pt Loma
Ensenada
Guadalupe I
Punta Eugenia
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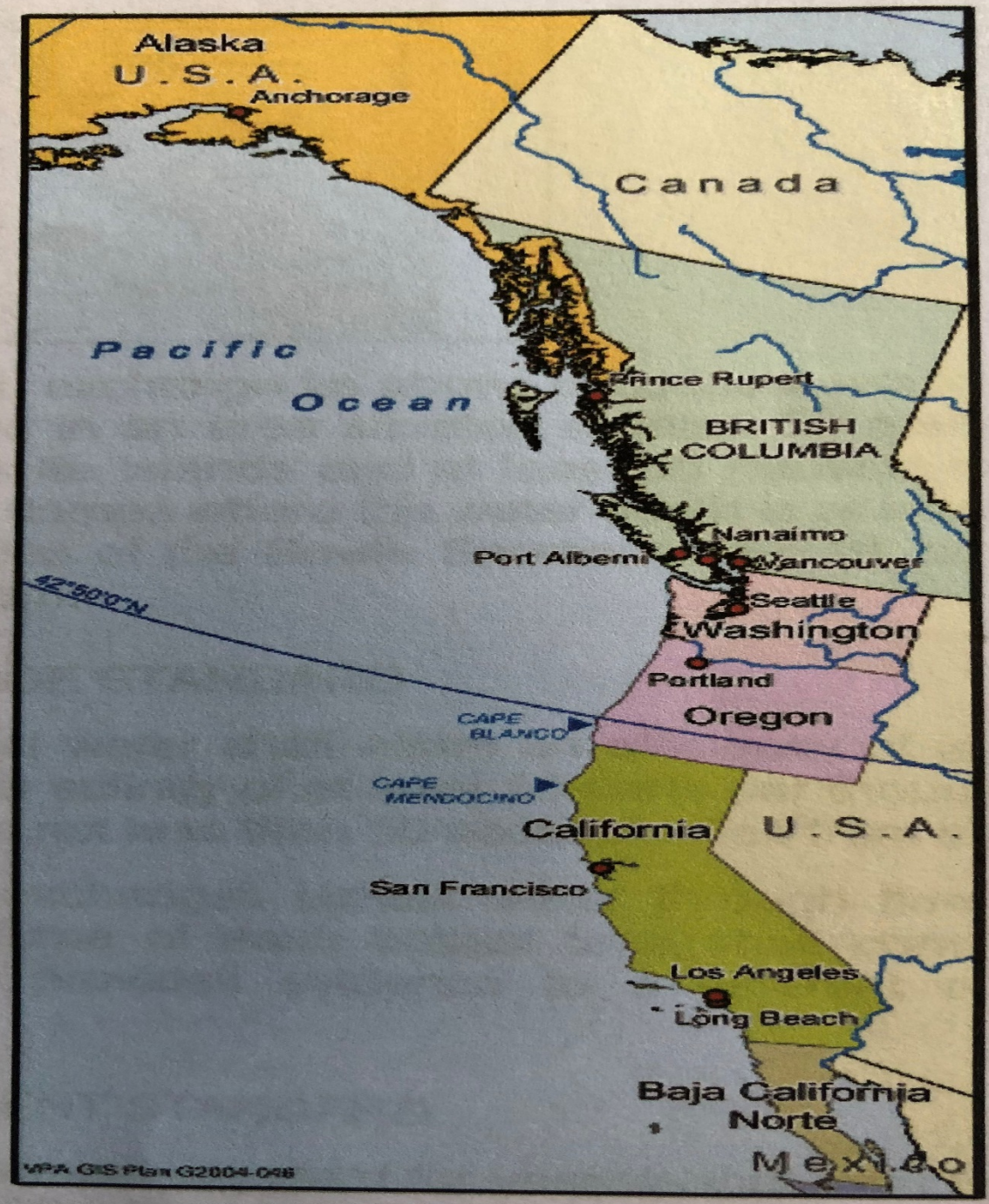
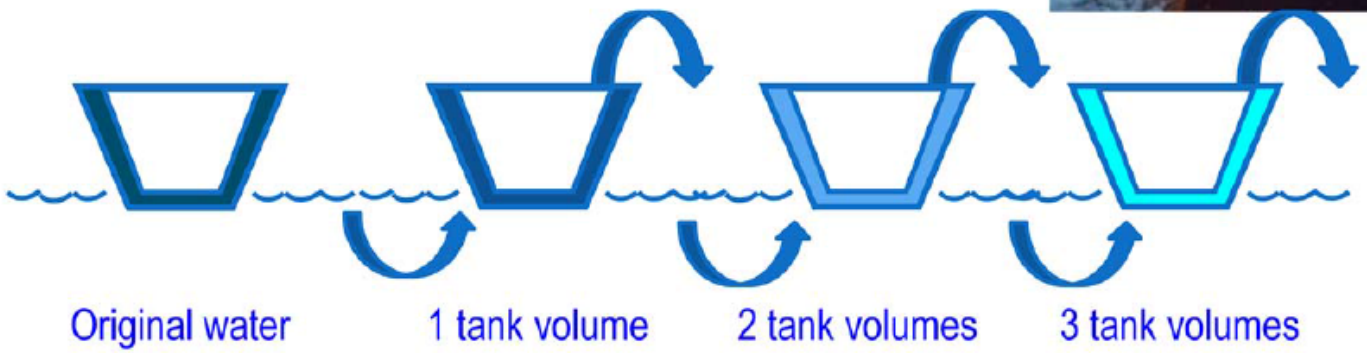

Alaska
U.S.A.
Anchorage
Canada
Pacific
Ocean
Prince Rupert
BRITISH
COLUMBIA
Nanaimo
Port Alberni
Vancouver
Seattle
Washington
42°50'0"N
Portland
Oregon
CAPE
BLANCO
CAPE
MENDOCINO
California
U.S.A.
San Francisco
Los Angeles
Long Beach
Baja California
Norte
Mexico
WPA GIS Plan G2004-048

SEQUENTIAL BWE (EMPTY REFILL)

- Ballast tank is first emptied, then refilled, to achieve at least 95% exchange of the original water

FLOW THROUGH BWE

- Replacement ballast water is pumped into the ballast tank bottom, and the excess water is allowed to exit the tank by the tank overflow or similar arrangement
- Three times the tank volume is pumped through the tank to achieve 95% volumetric exchange of the original water



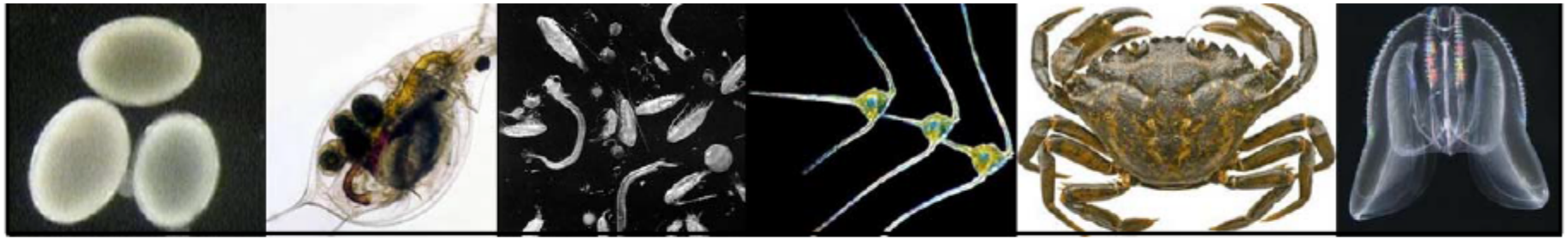
RATIONALE for EXCHANGE

1. Purges planktonic organisms from tanks
2. Reduces sediment accumulation (resting eggs and benthic taxa)
3. Reduces fitness of taxa remaining in tanks through salinity shock
4. Any saltwater species entrained from the ocean should have reduced fitness if released in freshwater/coastal habitats

LIMITATIONS OF BALLAST EXCHANGE

- Ship safety
- Volumetric exchange can be variable (80-100%) - influenced by tank structure, weather and crew
- Proportional reduction may be insufficient if initial density very high
  (1% survival could still be thousands of individuals)
- Applicable only for transoceanic ships
  (cannot curtail spread by domestic or coastal shipping)
- Less protective of brackish/marine ports than freshwater ports – reduced effect of osmotic shock

LIMITATIONS OF BALLAST WATER EXCHANGE



While BWE has been a 'good news' story for the Great Lakes, it is not a perfect solution. There are a number of limitations that make BWE less than 100% effective. In particular, there are concerns that BWE is less protective of Canada's coastal ports, since there is a reduced effect of salinity shock when the receiving ports are marine (rather than freshwater).

EXCHANGE - TRANSOCEANIC

- Ships that navigate beyond 200 nm where the water depth is at least 2000 m must exchange in those waters

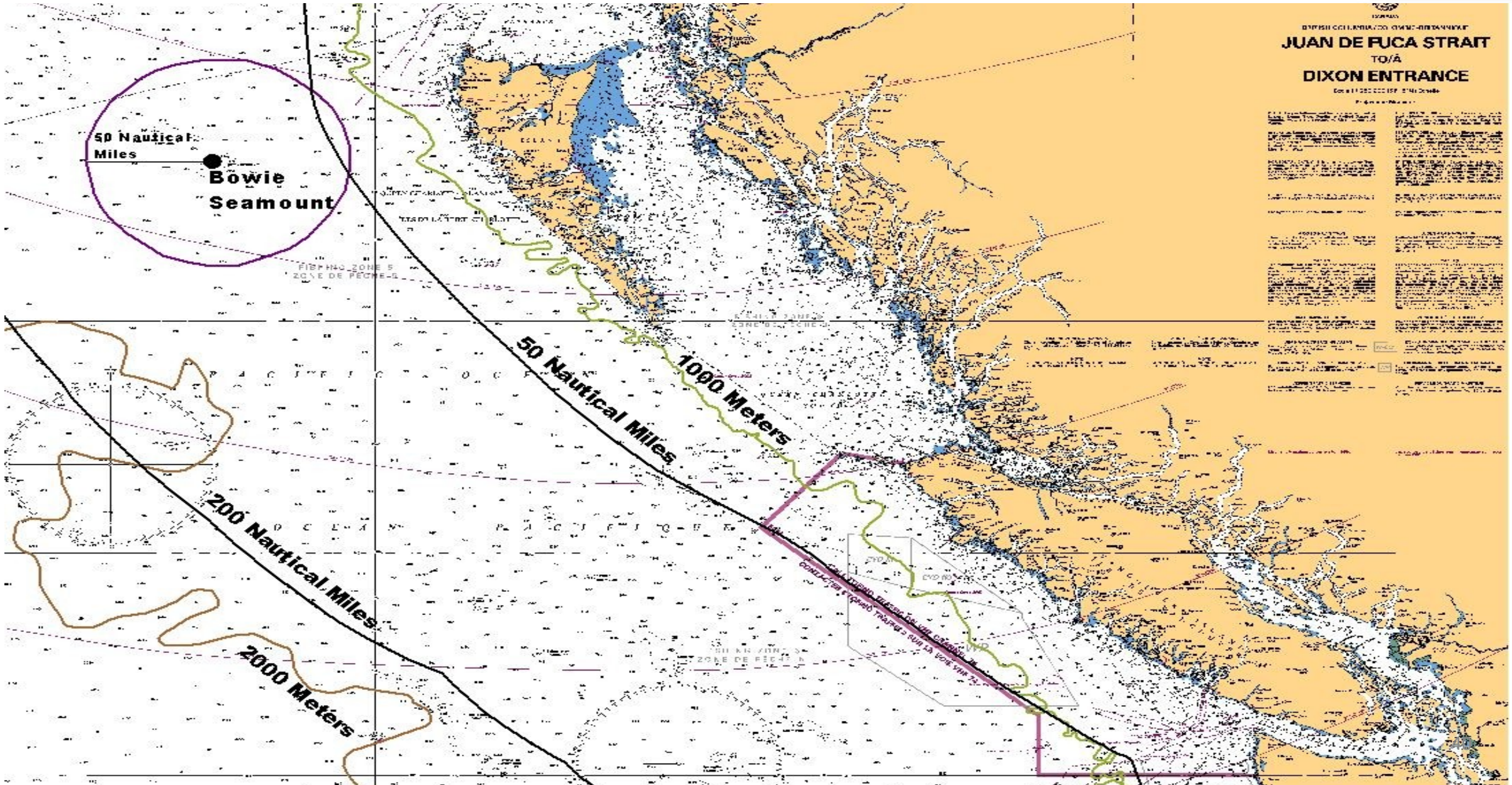
What if the above requirements cannot be met:

- In respect of a voyage to a port, offshore terminal or anchorage area on the west coast of Canada, an area at least 50 nautical miles west of Vancouver Island and the Queen Charlotte Islands and at least 50 nautical miles west of a line extending from Cape Scott to Cape St. James where the water depth is at least 500 m, with the exception of waters within 50 nautical miles of the Bowie Seamount (53°18’ north latitude and 135°40’ west longitude);

EXCHANGE – NON TRANSOCEANIC

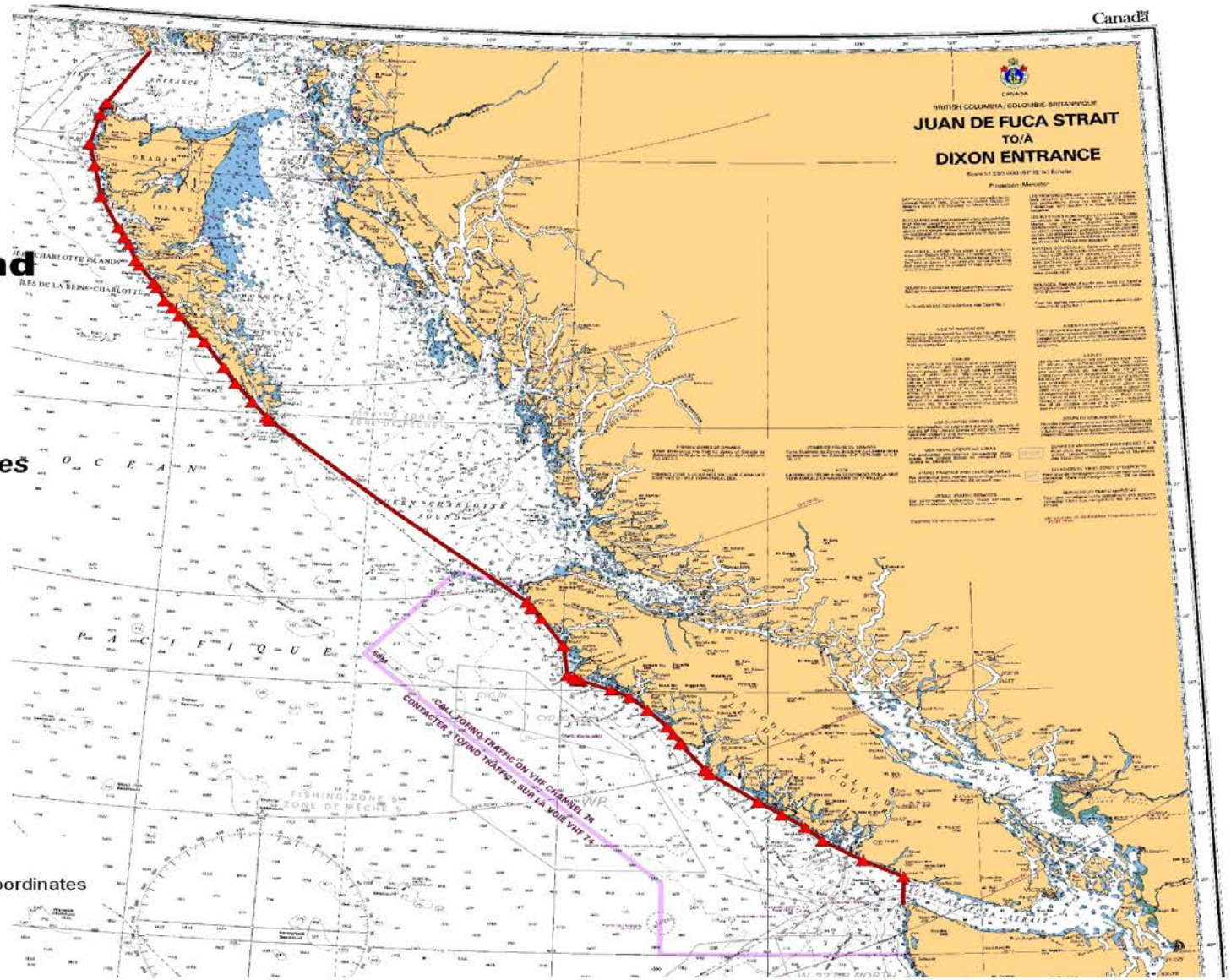
- Applies to ships that exchange ballast water and does not navigate beyond 200 nm from shore where the depth of water is at least 2000 m

- Those vessels cannot discharge BW unless it's been exchanged at least 50 nm from shore where the water depth is at least 500 m


JUAN DE FUCA STRAIT
TO/Á
DIXON ENTRANCE
50 Nautical Miles
Bowie Seamount
50 Nautical Miles
1000 Meters
200 Nautical Miles
2000 Meters

Pacific Coast Territorial Sea Coordinates and Baseline

As per the Territorial Sea Geographical Coordinates Order, Oceans Act



Transport Canada
Pacific Region

▲ Coastal Baseline

Territorial Sea Geographical Coordinates

Created by: Susie Harder
Date created: February 16, 2010
Map Projection: BC_Albers
Datum: NAD 83
Scale: 1:4 000 000
Basemap: Canadian Hydrographic Services (CHS)
Electronic Marine Chart No. 3000

Transport Canada - Marine Security Operations Centre (W)
Esquimalt, British Columbia (250) 363-4850

marsecw@tc.gc.ca

Vessels Entering Western Canada 03/Apr/2018

96 hour reports filed in the last 4 days

Vessels entered since last report are in **BOLD**

BRITISH COLUMBIA

IMO	VESSEL NAME	FLAG	VESSEL TYPE	NPOC	ETA	LPOC 1	DEPART DATE 1	LPOC 2	DEPART DATE 2	LPOC 3	DEPART DATE
9218131	**NORWEGIAN SUN**	**BAHAMAS (BHS)**	**PASSENGER/CRUISE**	**VICTORIA (VIC), CANAD**	**03-Apr-2018 08:00 UTC**	**LOS ANGELES (LAX), UNIT**	**31-Mar-2018**	**ENSENADA (ESE), MEXICO**	**30-Mar-2018**	**CABO SAN LUCAS (CSL), MEXI**	**28-Mar-2018**
9252553	NORTHERN MAGNITUDE	PORTUGAL (PRT)	CONTAINER SHIP (FULLY CELLU	PRINCE RUPERT (PRF	03-Apr-2018 08:00 UTC	BUSAN (PUS), KOREA, RE	24-Mar-2018	SHANGHAI (LOUJING) (SH	22-Mar-2018	CHINA UNKNOWN, CHINA (CH	21-Mar-2018
9767314	ALCOR	BAHAMAS (BHS)	BULK CARRIER	STEWART (STW), CAN/	03-Apr-2018 09:00 UTC	HAWK INLET (HWI), UNITE	31-Mar-2018	SKAGWAY (SGY), UNITED	30-Mar-2018	YEOSU (YOS), KOREA, REPUE	14-Mar-2018
9493016	ALONA	MALTA (MLT)	BULK CARRIER	VANCOUVER (VAN), CA	03-Apr-2018 11:00 UTC	RIZHAO (LANQIAO) (RZH),	18-Mar-2018	GLADSTONE (GLT), AUSTI	18-Feb-2018	RIZHAO (LANQIAO) (RZH), CHI	19-Jan-2018
9773480	ALASKA	PANAMA (PAN)	BULK CARRIER	NANAIMO (NNO), CANA	03-Apr-2018 12:00 UTC	TAICANG (TAG), CHINA (CI	15-Mar-2018	NANAIMO (NNO), CANADA	07-Feb-2018	XIUYU (XIU), CHINA (CHN)	08-Jan-2018
6701462	NORTHERN EAGLE	UNITED STATES OF	FISHING VESSEL	VANCOUVER (VAN), CA	03-Apr-2018 14:00 UTC	SEATTLE (SEA), UNITED S	03-Apr-2018	DUTCH HARBOR (DUT), U	18-Mar-2018	DUTCH HARBOR (DUT), UNITI	14-Mar-2018
9353539	**OVERSEAS LOS ANGELES**	**UNITED STATES OF A**	**CRUDE/OIL PRODUCTS TANKER**	**VANCOUVER (VAN), CA**	**03-Apr-2018 16:00 UTC**	**CHERRY POINT (CP4), UNI**	**03-Apr-2018**	**SAN FRANCISCO (SFO), UN**	**29-Mar-2018**	**CHERRY POINT (CP4), UNITED**	**23-Mar-2018**
9560352	SEATTLE BRIDGE	PANAMA (PAN)	CONTAINER SHIP (FULLY CELLU	VANCOUVER (VAN), CA	03-Apr-2018 22:00 UTC	TACOMA (TIW), UNITED ST	03-Apr-2018	TOKYO (TYO), JAPAN (JPN	22-Mar-2018	NAGOYA (NGO), JAPAN (JPN)	21-Mar-2018
9495727	ANEMOS	GREECE (GRC)	BULK CARRIER	VANCOUVER (VAN), CA	04-Apr-2018 03:00 UTC	PUSAN (PSN), KOREA, RE	18-Mar-2018	LIANYUNGANG (LYG), CHI	16-Mar-2018	NANTONG (NTG), CHINA (CHI	06-Mar-2018
9697430	NAVE PYXIS	PANAMA (PAN)	CHEMICAL/PRODUCTS TANKER	VANCOUVER (VAN), CA	04-Apr-2018 06:00 UTC	GUAYMAS (GYM), MEXICO	28-Mar-2018	MAZATLAN (MZT), MEXICO	25-Mar-2018	MANZANILLO (ZLO), MEXICO (I	23-Mar-2018
9316945	KEN TOKU	PANAMA (PAN)	BULK CARRIER	VANCOUVER (VAN), CA	04-Apr-2018 08:00 UTC	GUAYMAS (GYM), MEXICO	23-Mar-2018	NIIHAMA (IHA), JAPAN (JPN	17-Feb-2018	KASHIMA (KSM), JAPAN (JPN)	08-Feb-2018
9160798	SAGA BEIJA-FLOR	HONG KONG SPECI	GENERAL CARGO SHIP	KITIMAT (KTM), CANAD/	04-Apr-2018 17:00 UTC	LOS ANGELES (LAX), UNIT	30-Mar-2018	BEACH (EAC), UNITED ST/	28-Mar-2018	LOS ANGELES (LAX), UNITED	24-Mar-2018
9261449	IKARIA	LIBERIA (LBR)	CONTAINER SHIP (FULLY CELLU	VANCOUVER (VAN), CA	04-Apr-2018 17:00 UTC	KAOHSIUNG (KHH), TAIWA	14-Mar-2018	YANTIAN (YTN), CHINA (CH	12-Mar-2018	HONG KONG (HKG), HONG KO	11-Mar-2018
9462017	APL SOUTHAMPTON	SINGAPORE (SGP)	CONTAINER SHIP (FULLY CELLU	VANCOUVER (VAN), CA	04-Apr-2018 18:00 UTC	BUSAN (PUS), KOREA, RE	26-Feb-2018	SHANGHAI (LOUJING) (SH	23-Feb-2018	NINGBO (ZHOU SHAN) (NGB),	19-Mar-2018
9396141	STAR KINN	NORWAY (NOR)	OPEN HATCH CARGO SHIP	NEW WESTMINSTER (N	04-Apr-2018 19:00 UTC	LOS ANGELES (LAX), UNIT	01-Apr-2018	CORINTO (CIO), NICARAG	25-Mar-2018	CRISTOBAL (CTB), PANAMA (P	13-Mar-2018
9760055	CHRISTINA	MARSHALL ISLANDS	BULK CARRIER	VANCOUVER (VAN), CA	04-Apr-2018 20:00 UTC	VOSTOCHNYY PORT (VYP	19-Mar-2018	TAMANO (TAM), JAPAN (JP	15-Mar-2018		
9668879	ATROTOS HERACLES	PANAMA (PAN)	BULK CARRIER	PRINCE RUPERT (PRF	04-Apr-2018 23:00 UTC	YEOSU (YOS), KOREA, RE	22-Mar-2018	DANGJIN-GUN (TJI), KORE	19-Mar-2018	LYTTELTON (LYT), NEW ZEAL/	20-Feb-2018
9691618	PAUL OLDENDORFF	PORTUGAL (PRT)	BULK CARRIER	VANCOUVER (VAN), CA	05-Apr-2018 01:00 UTC	KASHIMA (KSM), JAPAN (JF	22-Mar-2018	TOKACHI (TOK), JAPAN (JF	14-Mar-2018	OTARU (OTR), JAPAN (JPN)	10-Mar-2018
9388297	SELECAO	LIBERIA (LBR)	CRUDE/OIL PRODUCTS TANKER	VANCOUVER (VAN), CA	05-Apr-2018 01:00 UTC	SAN FRANCISCO (SFO), U	03-Apr-2018	SAN FRANCISCO (SFO), U	31-Mar-2018	ESMERALDAS (ESM), ECUADO	13-Mar-2018
9551715	CENTAURUS DREAM	JAPAN (JPN)	BULK CARRIER	ROBERT'S BANK (RTB)	05-Apr-2018 01:00 UTC	ZHOUSHAN (ZOS), CHINA	14-Mar-2018	SAMARINDA (SRI), INDONI	14-Jan-2018	CIGADING (CIG), INDONESIA (	28-Dec-2017
9659921	ATLANTIC TRAMP	PANAMA (PAN)	BULK CARRIER	VANCOUVER (VAN), CA	05-Apr-2018 05:00 UTC	STOCKTON (SCK), UNITEI	29-Mar-2018	MURORAN (MUR), JAPAN (	09-Mar-2018	KASHIMA (KSM), JAPAN (JPN)	03-Mar-2018
9727144	TAI SUMMIT	PANAMA (PAN)	BULK CARRIER	VANCOUVER (VAN), CA	05-Apr-2018 18:00 UTC	KINUURA (KNU), JAPAN (J	22-Mar-2018	PANAMA CANAL (TRANSIT	10-Feb-2018	BATON ROUGE (BTR), UNITEI	02-Feb-2018
9738789	CLIPPER VICTORY	SINGAPORE (SGP)	BULK CARRIER	VANCOUVER (VAN), CA	06-Apr-2018 01:30 UTC	ZHOUSHAN (ZOS), CHINA	17-Mar-2018	GWANGYANG (KAN), KORI	03-Mar-2018	TABONEO (TAB), INDONESIA (	18-Feb-2018
9318113	ORCA 1	PANAMA (PAN)	CONTAINER SHIP (FULLY CELLU	VANCOUVER (VAN), CA	06-Apr-2018 02:00 UTC	PUSAN (PSN), KOREA, RE	26-Mar-2018	SHANGHAI (LOUJING) (SH	25-Mar-2018	NINGBO (ZHOU SHAN) (NGB),	23-Mar-2018
9472153	COSCO PRIDE	HONG KONG SPECI	CONTAINER SHIP (FULLY CELLU	PRINCE RUPERT (PRF	06-Apr-2018 11:00 UTC	YANGSHAN (YAN), CHINA (	26-Mar-2018	QINGDAO (TAO), CHINA (C	24-Mar-2018	TIANJIN (TSN), CHINA (CHN)	22-Mar-2018
9501370	ESSEN EXPRESS	GERMANY (DEU)	CONTAINER SHIP (FULLY CELLU	VANCOUVER (VAN), CA	06-Apr-2018 16:30 UTC	PUSAN (PSN), KOREA, RE	28-Mar-2018	SHANGHAI (LOUJING) (SH	26-Mar-2018	NINGBO PT (NBP), CHINA (CH	24-Mar-2018
9138111	**CSL SPIRIT**	**BAHAMAS (BHS)**	**BULK CARRIER, SELF-DISCHARGI**	**PORT MCNEILL (PMA),**	**07-Apr-2018 06:00 UTC**	**TACOMA (TIW), UNITED ST**	**05-Apr-2018**	**ISLA SAN MARCOS (SAN M**	**28-Mar-2018**	**PUERTO QUETZAL (PRQ), GUA**	**21-Mar-2018**
9336854	ATLANTIC YUCATAN	SINGAPORE (SGP)	BULK CARRIER	PRINCE RUPERT (PRF	07-Apr-2018 10:00 UTC	YEOSU (YOS), KOREA, RE	24-Mar-2018	ZHOUSHAN (ZOS), CHINA	22-Mar-2018	BAYUQUAN (BAY), CHINA (CHI	24-Feb-2018
9490301	**FUJI GALAXY**	**MARSHALL ISLANDS**	**CHEMICAL/PRODUCTS TANKER**	**VANCOUVER (VAN), CA**	**07-Apr-2018 14:30 UTC**	**LOS ANGELES (LAX), UNIT**	**02-Apr-2018**	**SAN FRANCISCO (SFO), UN**	**27-Mar-2018**	**BAYUQUAN (BAY), CHINA (CHN**	**07-Mar-2018**
9442536	SONGA HIROSE	CAYMAN ISLANDS ((	BULK CARRIER	VANCOUVER (VAN), CA	07-Apr-2018 20:00 UTC	HAKATA (HTD), JAPAN (JPI	23-Mar-2018	KOBE (UKB), JAPAN (JPN)	07-Mar-2018	NAGOYA (NGO), JAPAN (JPN)	28-Feb-2018
9583017	KING ISLAND	PANAMA (PAN)	BULK CARRIER	VANCOUVER (VAN), CA	08-Apr-2018 11:00 UTC	KOBE (UKB), JAPAN (JPN)	24-Mar-2018	BALBOA (FUERTE AMADOI	10-Feb-2018	ORLEANS (OLN), UNITED STA	01-Feb-2018
9534999	**OCEAN APHRODITE**	**HONG KONG SPECIA**	**BULK CARRIER**	**VANCOUVER (VAN), CA**	**08-Apr-2018 11:00 UTC**	**QINGDAO (TAO), CHINA (CI**	**20-Mar-2018**	**SINGAPORE (SIN), SINGAP**	**04-Mar-2018**	**TAKORADI (TKD), GHANA (GHA**	**31-Jan-2018**
9614995	BRILLIANT JOURNEY	PANAMA (PAN)	BULK CARRIER	VANCOUVER (VAN), CA	08-Apr-2018 14:00 UTC	BUSAN (PUS), KOREA, RE	25-Mar-2018	XINGANG (XGG), CHINA (C	22-Mar-2018	SINGAPORE (SIN), SINGAPOR	09-Mar-2018
9736420	AMERICAN BULKER	PANAMA (PAN)	BULK CARRIER	STEWART (STW), CAN/	08-Apr-2018 14:30 UTC	TAICANG (TAG), CHINA (CI	23-Mar-2018	INCHEON (INCHON) (INC)	16-Mar-2018	CROFTON (CRO), CANADA (C/	21-Feb-2018
8608054	AUTO ATLAS	PANAMA (PAN)	VEHICLES CARRIER	NEW WESTMINSTER (N	08-Apr-2018 16:00 UTC	ULSAN (USN), KOREA, RE	25-Mar-2018	MOKPO (MOK), KOREA, RE	23-Mar-2018	KWANGYANG (KWA), KOREA, I	22-Mar-2018
9313307	COVENTRY	LIBERIA (LBR)	BULK CARRIER	VANCOUVER (VAN), CA	08-Apr-2018 20:00 UTC	KASHIMA (KSM), JAPAN (JF	26-Mar-2018	LONGVIEW (JLG), UNITED	22-Feb-2018	VANCOUVER (VAN), CANADA (	09-Feb-2018
9748368	**LA STELLA**	**BELGIUM (BEL)**	**BULK CARRIER**	**KITIMAT (KTM), CANAD**	**08-Apr-2018 22:00 UTC**	**GLADSTONE (GLT), AUSTR**	**19-Mar-2018**	**GRESIK (GRE), INDONESIA**	**02-Mar-2018**	**DUMAI (PELINTUNG) (DUM), INI**	**23-Feb-2018**
9676864	ARIES LEADER	PANAMA (PAN)	VEHICLES CARRIER	ANNACIS ISLAND (ANI)	10-Apr-2018 07:01 UTC	HITACHINAKA (HIC), JAPAI	28-Mar-2018	KAWASAKI (KWS), JAPAN (	26-Mar-2018	SINGAPORE (SIN), SINGAPOR	16-Mar-2018
9782015	OTAGO BAY	HONG KONG SPECI	BULK CARRIER	VANCOUVER (VAN), CA	14-Apr-2018 12:00 UTC	NAKHODKA (NJK), RUSSI/	18-Mar-2018	TAICANG (TAG), CHINA (CI	12-Mar-2018	CAOFEIDIAN (CFD), CHINA (CI	02-Mar-2018

BALLAST WATER INVASIVE SPECIES REPORT

BALLAST	IMO	VESSEL NAME	BWTS MANUFACTURER	BWTS MODEL	NPOC	ETA	LPOC 1	VESSEL TYPE	No. of Trips
Y	7926174	HONOURABLE HENRY JACKMAN			PORT MCNEILL (PMA), CANAD	01-Apr-2018	REDWOOD (DWR), UNITED	BULK CARRIER	1
N	9722443	INDIGO LAKE			VANCOUVER (VAN), CANADA (C	01-Apr-2018	MANZANILLO (ZLO), MEXICO	BULK CARRIER	2
Y	9218428	OURANIA LUCK			VANCOUVER (VAN), CANADA (C	01-Apr-2018	BUSAN (PUS), KOREA, REPU	BULK CARRIER	3
N	9749441	ARPEGGIO			VANCOUVER (VAN), CANADA (C	01-Apr-2018	CRISTOBAL (CTB), PANAMA	CRUDE/OIL PRC	4
Y	9520974	CONON			VANCOUVER (VAN), CANADA (	01-Apr-2018	ZHENJIANG (ZHN), CHINA (C	BULK CARRIER	5
N	9250232	ATLANTIC HIGHWAY			NEW WESTMINSTER (NWE), CA	01-Apr-2018	PORTLAND (OREGON) (PDX	VEHICLES CARI	6
N	9247730	NYK APOLLO			VANCOUVER (VAN), CANADA (	01-Apr-2018	TACOMA (TIW), UNITED STA	CONTAINER SH	7
Y	9523299	BAHIA I	JFE	Ballast Ace	VANCOUVER (VAN), CANADA (C	01-Apr-2018	QINGDAO (TAO), CHINA (CHI	BULK CARRIER	8
Not discharging BW into Canadian waters	9609237	SAKURA GLORY			VANCOUVER (VAN), CANADA (C	01-Apr-2018	KASHIMA (KSM), JAPAN (JPN	BULK CARRIER	9
Y	9392157	GLOBAL MERMAID			STEWART (STW), CANADA (CA	01-Apr-2018	NIIGATA (KIJ), JAPAN (JPN)	BULK CARRIER	10
N	9448762	COSCO PHILIPPINES			PRINCE RUPERT (PRR), CANAD	02-Apr-2018	YANGSHAN (YAN), CHINA (CH	CONTAINER SHI	11
N	9651113	GLOVIS CHAMPION			NEW WESTMINSTER (NWE), CA	02-Apr-2018	VANCOUVER (VAN), UNITED	RO-RO CARGO	12
N	9687215	BUENA VENTURA	TechCross	ElectroClean	VANCOUVER (VAN), CANADA (C	02-Apr-2018	CEDROS (CED), MEXICO (ME	BULK CARRIER	13
N	9624768	AMELIA	Panasia	GloEnPatrol	PRINCE RUPERT (PRR), CANAD	02-Apr-2018	ULSAN (USN), KOREA, REPU	CHEMICAL TANI	14
Y	9381524	PEDHOULAS COMMANDER			PRINCE RUPERT (PRR), CANAD	02-Apr-2018	NANTONG (NTG), CHINA (CH	BULK CARRIER	15
N	9182356	COMET ACE			VANCOUVER (VAN), CANADA (C	02-Apr-2018	KANDA (KND), JAPAN (JPN)	VEHICLES CARI	16
Y	9570864	PIAVIA			ROBERT'S BANK (RTB), CANAD	02-Apr-2018	HITACHINAKA (HIC), JAPAN (J	BULK CARRIER	17
N	9720500	MSC SASHA	Panasia	GloEnPatrol	VANCOUVER (VAN), CANADA (C	02-Apr-2018	OAKLAND (KND), UNITED ST	CONTAINER SHI	18
Y	9728198	NORD POLARIS	JFE	Ballast Ace	VANCOUVER (VAN), CANADA (C	02-Apr-2018	TACOMA (TIW), UNITED STA	BULK CARRIER	19
N	9252553	NORTHERN MAGNITUDE			PRINCE RUPERT (PRR), CANAD	03-Apr-2018	BUSAN (PUS), KOREA, REPU	CONTAINER SHI	20
Y	9218131	NORWEGIAN SUN			VICTORIA (VIC), CANADA (CAN	03-Apr-2018	LOS ANGELES (LAX), UNITE	PASSENGER/CF	21
Y	9767314	ALCOR			STEWART (STW), CANADA (CAI	03-Apr-2018	HAWK INLET USA	BULK CARRIER	22
Y	9493016	ALONA			VANCOUVER (VAN), CANADA (C	03-Apr-2018	RIZHAO (LANQIAO) (RZH), CH	BULK CARRIER	23
Y	9495727	ANEMOS			VANCOUVER (VAN), CANADA (C	03-Apr-2018	LIANYUNGANG (CHN) CHINA	BULK CARRIER	24
Y	9773480	ALASKA			NANAIMO (NNO), CANADA (CA	03-Apr-2018	TAICANG (TAG), CHINA (CHI	BULK CARRIER	25
N	6701462	NORTHERN EAGLE			VANCOUVER (VAN), CANADA (C	03-Apr-2018	SEATTLE (SEA), UNITED STA	FISHING VESSEI	26
N	9353539	OVERSEAS LOS ANGELES			VANCOUVER (VAN), CANADA (	03-Apr-2018	CHERRY POINT (CP4), UNIT	CRUDE/OIL PRC	27
N	9560352	SEATTLE BRIDGE			VANCOUVER (VAN), CANADA (C	03-Apr-2018	TACOMA (TIW), UNITED STA	CONTAINER SHI	28
N	9462017	APL SOUTHAMPTON	TechCross	ElectroClean	VANCOUVER (VAN), CANADA (C	04-Apr-2018	PUSAN (PSN), KOREA	CONTAINER SHI	29
Y	9551715	CENTAURUS DREAM			ROBERT'S BANK (RTB), CANAD	04-Apr-2018	ZHOUSHAN (ZOS), CHINA (CH	BULK CARRIER	30
Y - scanned BWRF	9760055	CHRISTINA			VANCOUVER (VAN), CANADA (C	04-Apr-2018	VOSTOCHNY (VST), RUSSIA	BULK CARRIER	31
N	9697430	NAVE PYXIS			VANCOUVER (VAN), CANADA (C	04-Apr-2018	GUAYMAS (GYM), MEXICO (M	CHEMICAL/PRO	32
Y	9316945	KEN TOKU			VANCOUVER (VAN), CANADA (C	04-Apr-2018	GUAYMAS (GYM), MEXICO (M	BULK CARRIER	33
N	9261449	IKARIA			VANCOUVER (VAN), CANADA (C	04-Apr-2018	KAOHSIUNG (KHH), TAIWAN,	CONTAINER SHI	34
Y	9160798	SAGA BEIJA-FLOR	Optimarin		KITIMAT (KTM), CANADA (CAN)	04-Apr-2018	LOS ANGELES (LAX), UNITED	GENERAL CARC	35
Y	9396141	STAR KINN			NEW WESTMINSTER (NWE), CA	04-Apr-2018	LOS ANGELES (LAX), UNITE	OPEN HATCH C	36
Y	9668879	ATROTOS HERACLES			PRINCE RUPERT (PRR), CANAD	04-Apr-2018	YEOSU (YOS), KOREA, REP	BULK CARRIER	37
Y	9691618	PAUL OLDENDORFF			VANCOUVER (VAN), CANADA (C	05-Apr-2018	KASHIMA (KSM), JAPAN (JPN	BULK CARRIER	38
Y	9388297	SELECAO			VANCOUVER (VAN), CANADA (	05-Apr-2018	SAN FRANCISCO (SFO), UN	CRUDE/OIL PRC	39
W on board but no BW management on BWF	9659921	ATLANTIC TRAMP			VANCOUVER (VAN), CANADA (	05-Apr-2018	STOCKTON (SCK), UNITED S	BULK CARRIER	40
N	9727144	TAI SUMMIT			VANCOUVER (VAN), CANADA (C	05-Apr-2018	KINUURA (KNU), JAPAN (JPN)	BULK CARRIER	41

RISK MATRIX

- Master to Provide Information:
  - Nature of the ballast water,
  - Operations previously performed.
  - Prevailing sea conditions.
  - Harmful aquatic organisms and pathogens.
  - Remove or render harmless.
  - Feasibility (design and operation).
  - Consequences (ship and of persons on board).

BALLAST WATER INVASION PROBABILITY TOOL (DFO)

Ballast Water invasion probability (BWIP) tool requires data input

- Information is available on Ballast Water Reporting forms
- Tool ranks ships from most risky to least risky using best available science
- Inspectors can prioritize inspections based on best science
- Tool provides simple way to use available information to guide decision making
- Tested using data from past Non Indigenous Species (NIS) establishments to ensure risk ratings are providing valuable information.

BALLAST WATER RISK ASSESSMENT

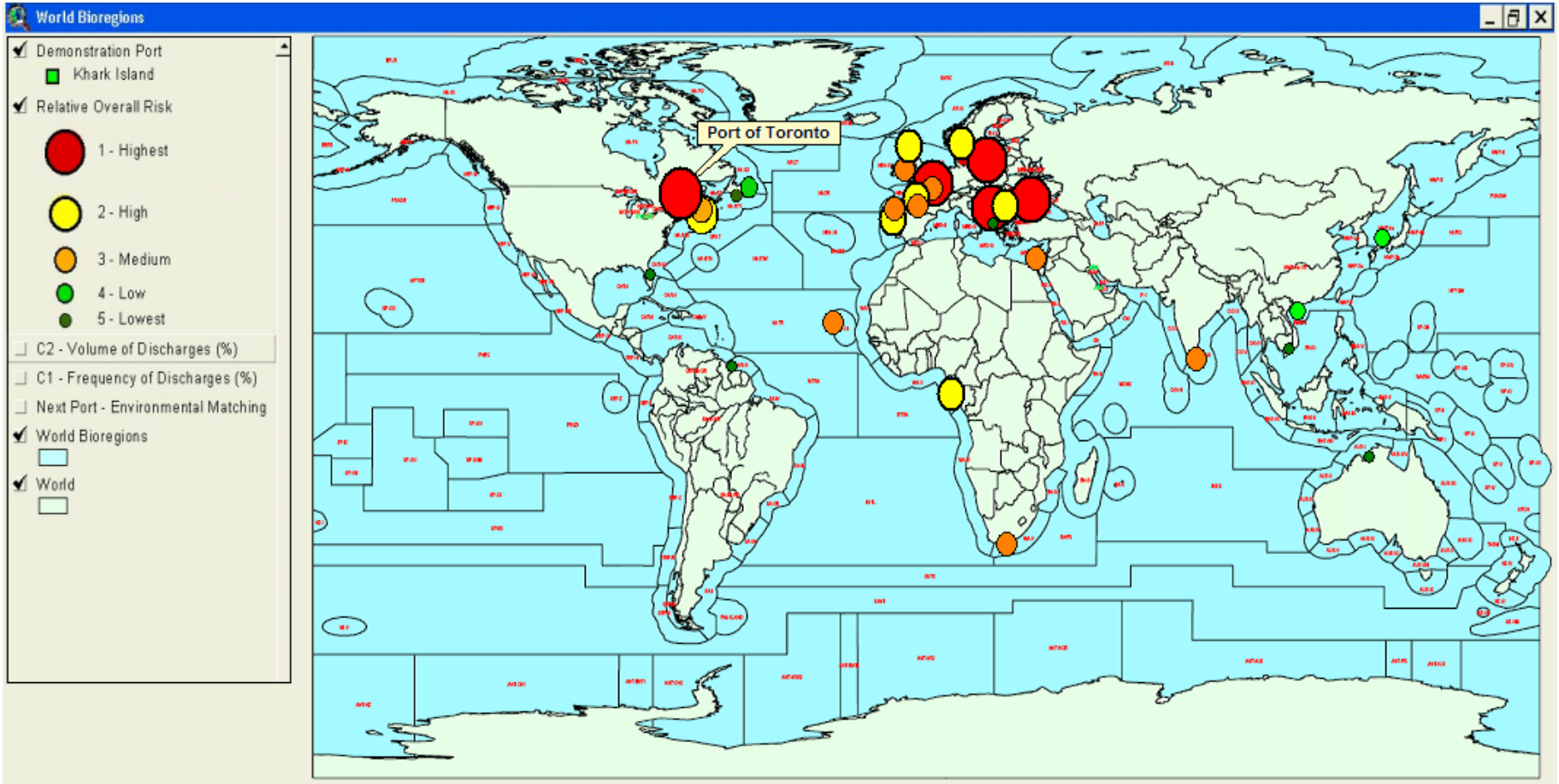
Ballast water risk assessment for VEWC for June 2017 - only vessels carrying and discharging ballast water in waters under Canadian jurisdiction

Indicates vessel has a BWTS on board.

Vessel Name	Ballast source	Ballast destination	Environmental Distance	Risk level
SITC Huashan, Tank 1	Zhoushan	Vancouver(CAN)	1.238	High risk
Nadine Venture, Tank 1	Hitachinaka	Vancouver(CAN)	1.773	Moderate risk
Anangel Transporter, T	Jingtang	Roberts Bank	0.809	High risk
Anangel Transporter, T	Tobata	Roberts Bank	1.817	Moderate risk
Anangel Transporter, T	44.17 , 150.31	Roberts Bank	1.34	High risk
Start Lysefjord, Tank 1	Changshu	Port Mellon	3.656	Low risk
Start Lysefjord, Tank 2	Changshu	Crofton	3.935	Low risk
Start Lysefjord, Tank 3	Changshu	Harmac	3.83	Low risk
Global Effort, Tank 1	Chiba	Vancouver(CAN)	2.062	Moderate risk
Global Effort, Tank 2	Naoetsu	Vancouver(CAN)	1.354	High risk
Global Effort, Tank 3	Ube	Vancouver(CAN)	1.433	High risk
NBA Magritte, Tank 1	Tachibana	Vancouver(CAN)	1.46	High risk
Silver Gertrude, Tank 1	Los Angeles	Vancouver(CAN)	1.459	High risk
Global Trinity, Tank 1	Tokachi	Vancouver(CAN)	1.265	High risk
Global Trinity, Tank 2	Nagoya	Vancouver(CAN)	1.374	High risk
Global Trinity, Tank 3	Kashima	Vancouver(CAN)	1.452	High risk
Leon, Tank 1	Ishinomaki	Vancouver(CAN)	1.308	High risk
Big Fish, Tank 1	Samcheon Po	Roberts Bank	1.289	High risk
Big Fish, Tank 2	Incheon	Roberts Bank	0.932	High risk
Flag Lama, Tank 1	Dalian	Vancouver(CAN)	1.022	High risk
Flag Lama, Tank 2	52.09 , -149.36	Vancouver(CAN)	1.342	High risk
Madeira, Tank 1	Shanhaiguan	Roberts Bank	0.944	High risk
African Raven, Tank 1	Kimitsu	Crofton	1.391	High risk
American Bulker, Tank	Kunsan	Port Alberni	3.789	Low risk
American Bulker, Tank	Incheon	Port Alberni	3.581	Low risk
Radiance of the Seas, T	58.16 , -137.05	Vancouver(CAN)	1.143	High risk
Radiance of the Seas, T	51.4 , -128.58	Vancouver(CAN)	1.053	High risk
Radiance of the Seas, T	52.07 , -129.35	Vancouver(CAN)	1.063	High risk
Radiance of the Seas, T	52.3 , -130.06	Vancouver(CAN)	1.074	High risk
Radiance of the Seas, T	-40.02 , 160.34	Vancouver(CAN)	1.899	Moderate risk
Radiance of the Seas, T	-25.51 , -152.46	Vancouver(CAN)	2.549	Moderate risk
Radiance of the Seas, T	52.51 , -130.32	Vancouver(CAN)	1.074	High risk
Radiance of the Seas, T	53.02 , -130.45	Vancouver(CAN)	1.074	High risk
Radiance of the Seas, T	51.32 , -128.48	Vancouver(CAN)	1.053	High risk
Nieuw Amsterdam, Tar	19.56 , -82.4	Vancouver(CAN)	2.922	Low risk
Nieuw Amsterdam, Tar	24.51 , -113.23	Vancouver(CAN)	1.958	Moderate risk

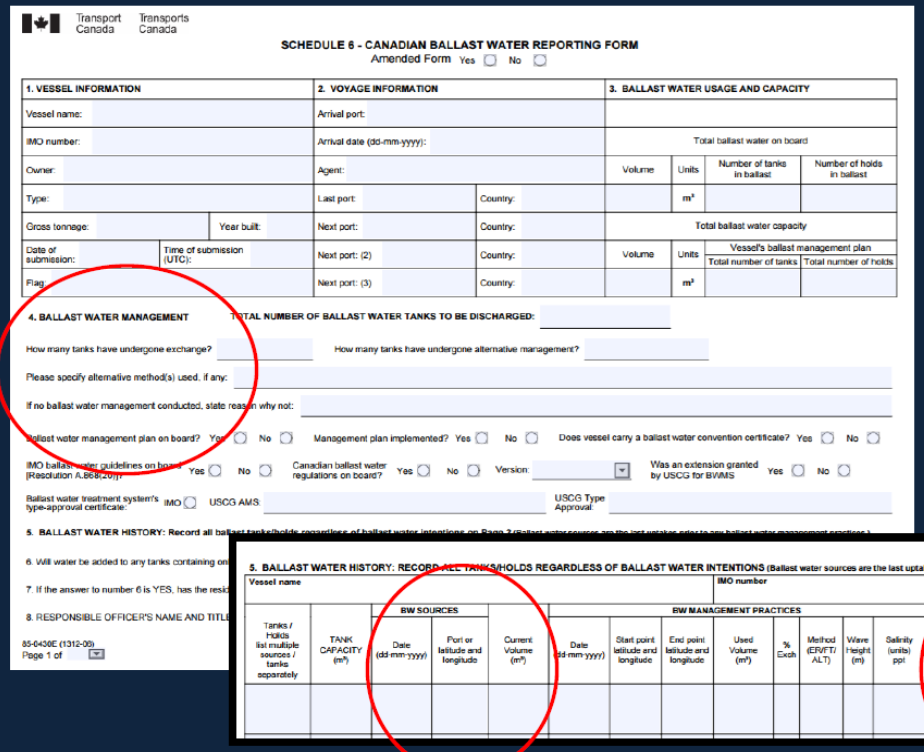
Very low risk	1
Low risk	11
Moderate risk	11
High risk	43
Very high risk	0
Total	66

EXAMPLES OF RISK ASSESSMENT



BALLAST WATER REPORTING FORM

Ballast Water Reporting Form



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SCHEDULE 6 - CANADIAN BALLAST WATER REPORTING FORM

Amended Form Yes ☐ No ☐

1. VESSEL INFORMATION		2. VOYAGE INFORMATION		3. BALLAST WATER USAGE AND CAPACITY			
Vessel name:		Arrival port:					
IMO number:		Arrival date (dd-mm-yyyy):		Total ballast water on board			
Owner:		Agent:		Volume	Units	Number of tanks in ballast	Number of holds in ballast
Type:		Last port:	Country:		m³		
Gross tonnage:	Year built:	Next port:	Country:	Total ballast water capacity			
Date of submission:	Time of submission (UTC):	Next port: (2)	Country:	Volume	Units	Vessel's ballast management plan	
						Total number of tanks	Total number of holds
Flag:		Next port: (3)	Country:		m³		

4. BALLAST WATER MANAGEMENT TOTAL NUMBER OF BALLAST WATER TANKS TO BE DISCHARGED:

How many tanks have undergone exchange? How many tanks have undergone alternative management?

Please specify alternative method(s) used, if any:

If no ballast water management conducted, state reason why not:

Ballast water management plan on board? Yes ☐ No ☐ Management plan implemented? Yes ☐ No ☐ Does vessel carry a ballast water convention certificate? Yes ☐ No ☐

IMO ballast water guidelines on board (Resolution A.868(20))? Yes ☐ No ☐ Canadian ballast water regulations on board? Yes ☐ No ☐ Version: Was an extension granted by USCG for BWMS Yes ☐ No ☐

Ballast water treatment system's type-approval certificate: IMO ☐ USCG AMS: USCG Type Approval:

5. BALLAST WATER HISTORY: Record all ballast tank/holds regardless of ballast water intentions (Ballast water sources are the last uptakes prior to any ballast water management practices.)

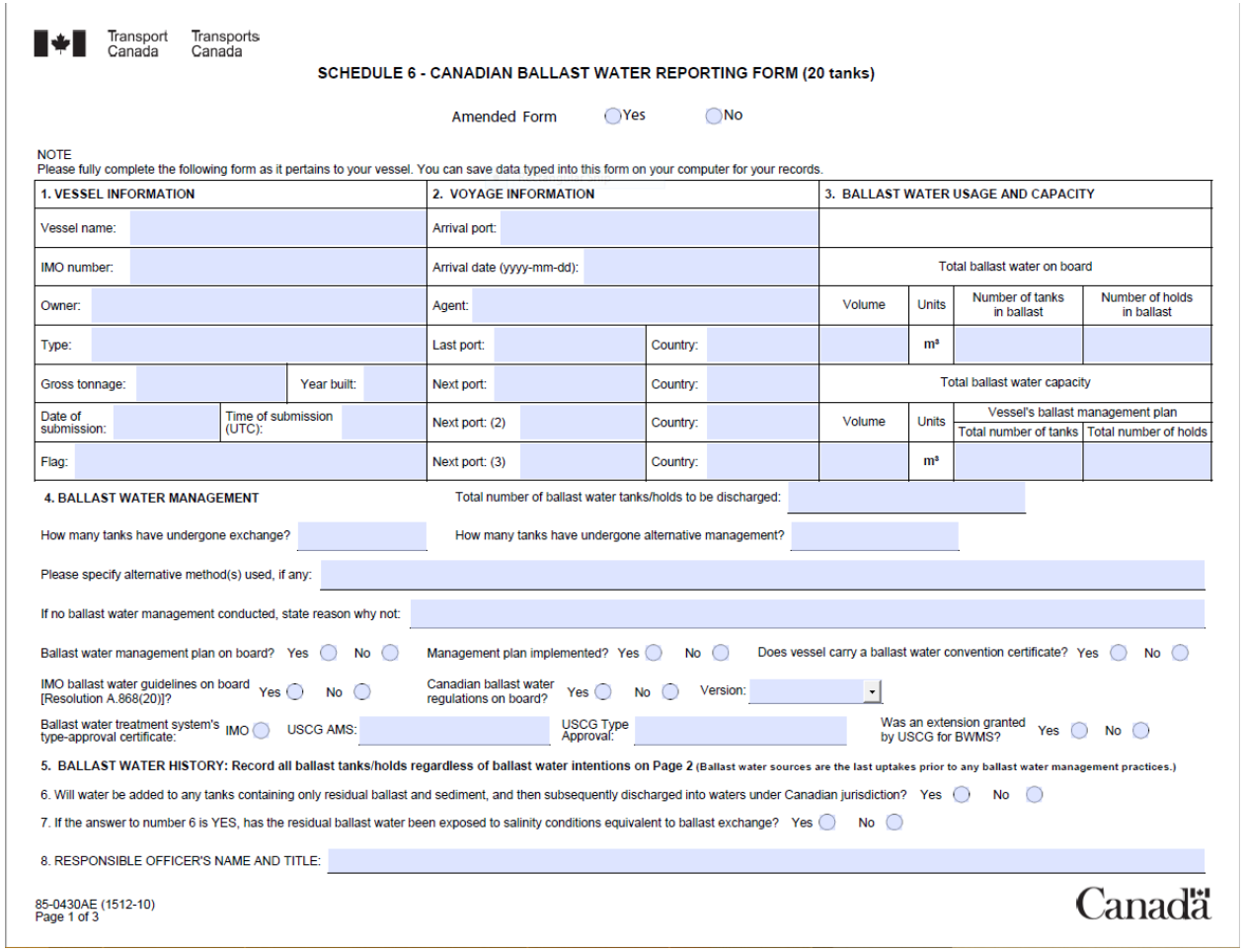
Vessel name | IMO number | Arrival date (dd-mm-yyyy)

Tanks / Holds (list multiple sources / tanks separately)	TANK CAPACITY (m³)	BW SOURCES			BW MANAGEMENT PRACTICES								PROPOSED BW DISCHARGE			
		Date (dd-mm-yyyy)	Port or latitude and longitude	Current Volume (m³)	Date (dd-mm-yyyy)	Start point latitude and longitude	End point latitude and longitude	Used Volume (m³)	% Exch	Method (ER/FT/ ALT)	Wave Height (m)	Salinity (units) ppt	Date (dd-mm-yyyy)	Port or latitude and longitude	Volume (m³)	Salinity (units) ppt

85-6430E (1312-09) Page 1 of

Transport Canada receives ballast water data from reporting forms required for incoming ships

BALLAST WATER REPORTING FORM



Transport Canada Transports Canada

SCHEDULE 6 - CANADIAN BALLAST WATER REPORTING FORM (20 tanks)

Amended Form ◯Yes ◯No

NOTE
Please fully complete the following form as it pertains to your vessel. You can save data typed into this form on your computer for your records.

1. VESSEL INFORMATION		2. VOYAGE INFORMATION		3. BALLAST WATER USAGE AND CAPACITY			
Vessel name:		Arrival port:					
IMO number:		Arrival date (yyyy-mm-dd):		Total ballast water on board			
Owner:		Agent:		Volume	Units	Number of tanks in ballast	Number of holds in ballast
Type:		Last port:	Country:		m³		
Gross tonnage:	Year built:	Next port:	Country:	Total ballast water capacity			
Date of submission:	Time of submission (UTC):	Next port: (2)	Country:	Volume	Units	Vessel's ballast management plan	
						Total number of tanks	Total number of holds
Flag:		Next port: (3)	Country:		m³		

4. BALLAST WATER MANAGEMENT

Total number of ballast water tanks/holds to be discharged:

How many tanks have undergone exchange?

How many tanks have undergone alternative management?

Please specify alternative method(s) used, if any:

If no ballast water management conducted, state reason why not:

Ballast water management plan on board? Yes ◯ No ◯ Management plan implemented? Yes ◯ No ◯ Does vessel carry a ballast water convention certificate? Yes ◯ No ◯

IMO ballast water guidelines on board [Resolution A.868(20)]? Yes ◯ No ◯ Canadian ballast water regulations on board? Yes ◯ No ◯ Version:

Ballast water treatment system's type-approval certificate: IMO ◯ USCG AMS: USCG Type Approval: Was an extension granted by USCG for BWMS? Yes ◯ No ◯

5. BALLAST WATER HISTORY: Record all ballast tanks/holds regardless of ballast water intentions on Page 2 (Ballast water sources are the last uptakes prior to any ballast water management practices.)

6. Will water be added to any tanks containing only residual ballast and sediment, and then subsequently discharged into waters under Canadian jurisdiction? Yes ◯ No ◯

7. If the answer to number 6 is YES, has the residual ballast water been exposed to salinity conditions equivalent to ballast exchange? Yes ◯ No ◯

8. RESPONSIBLE OFFICER'S NAME AND TITLE:

85-0430AE (1512-10)
Page 1 of 3

Canada

BALLAST WATER RECORD OF TANKS

5. BALLAST WATER HISTORY: RECORD ALL TANKS/HOLDS REGARDLESS OF BALLAST WATER INTENTIONS (Ballast water sources are the last uptakes prior to any ballast water management practices.)

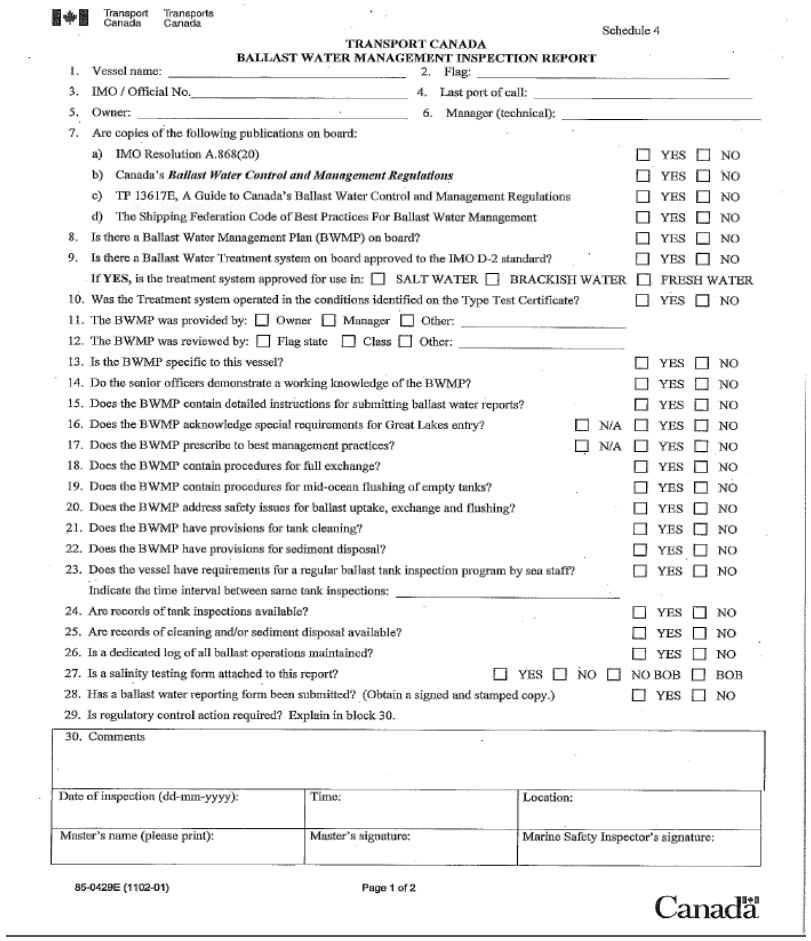
Vessel name	IMO number	Arrival date (yyyy-mm-dd)

		BW SOURCES			BW MANAGEMENT PRACTICES								PROPOSED BW DISCHARGE			
Tanks / Holds list multiple sources / tanks separately	TANK CAPACITY (m^3)	Date (yyyy-mm-dd)	Port or latitude and longitude	Volume (m^3) On Arrival	Date (yyyy-mm-dd)	Start point latitude and longitude	End point latitude and longitude	Used Volume (m^3)	% Exch	Method (ER/FT/ ALT)	Wave Height (m)	Salinity (units) ppt	Date (yyyy-mm-dd)	Port or latitude and longitude	Volume (m^3)	Salinity (units) ppt

85-0430AE (1512-10)
Page 2 of 3

Canada

BALLAST INSPECTION REPORT



Transport Canada Transports Canada

Schedule 4

TRANSPORT CANADA
BALLAST WATER MANAGEMENT INSPECTION REPORT

1. Vessel name: _____ 2. Flag: _____
3. IMO / Official No. _____ 4. Last port of call: _____
5. Owner: _____ 6. Manager (technical): _____
7. Are copies of the following publications on board:
   a) IMO Resolution A.868(20) ☐ YES ☐ NO
   b) Canada's ***Ballast Water Control and Management Regulations*** ☐ YES ☐ NO
   c) TP 13617E, A Guide to Canada's Ballast Water Control and Management Regulations ☐ YES ☐ NO
   d) The Shipping Federation Code of Best Practices For Ballast Water Management ☐ YES ☐ NO
8. Is there a Ballast Water Management Plan (BWMP) on board? ☐ YES ☐ NO
9. Is there a Ballast Water Treatment system on board approved to the IMO D-2 standard? ☐ YES ☐ NO
   If **YES,** is the treatment system approved for use in: ☐ SALT WATER ☐ BRACKISH WATER ☐ FRESH WATER
10. Was the Treatment system operated in the conditions identified on the Type Test Certificate? ☐ YES ☐ NO
11. The BWMP was provided by: ☐ Owner ☐ Manager ☐ Other: _____
12. The BWMP was reviewed by: ☐ Flag state ☐ Class ☐ Other: _____
13. Is the BWMP specific to this vessel? ☐ YES ☐ NO
14. Do the senior officers demonstrate a working knowledge of the BWMP? ☐ YES ☐ NO
15. Does the BWMP contain detailed instructions for submitting ballast water reports? ☐ YES ☐ NO
16. Does the BWMP acknowledge special requirements for Great Lakes entry? ☐ N/A ☐ YES ☐ NO
17. Does the BWMP prescribe to best management practices? ☐ N/A ☐ YES ☐ NO
18. Does the BWMP contain procedures for full exchange? ☐ YES ☐ NO
19. Does the BWMP contain procedures for mid-ocean flushing of empty tanks? ☐ YES ☐ NO
20. Does the BWMP address safety issues for ballast uptake, exchange and flushing? ☐ YES ☐ NO
21. Does the BWMP have provisions for tank cleaning? ☐ YES ☐ NO
22. Does the BWMP have provisions for sediment disposal? ☐ YES ☐ NO
23. Does the vessel have requirements for a regular ballast tank inspection program by sea staff? ☐ YES ☐ NO
    Indicate the time interval between same tank inspections: _____
24. Are records of tank inspections available? ☐ YES ☐ NO
25. Are records of cleaning and/or sediment disposal available? ☐ YES ☐ NO
26. Is a dedicated log of all ballast operations maintained? ☐ YES ☐ NO
27. Is a salinity testing form attached to this report? ☐ YES ☐ NO ☐ NO BOB ☐ BOB
28. Has a ballast water reporting form been submitted? (Obtain a signed and stamped copy.) ☐ YES ☐ NO
29. Is regulatory control action required? Explain in block 30.

30. Comments

Date of inspection (dd-mm-yyyy):	Time:	Location:
Master's name (please print):	Master's signature:	Marine Safety Inspector's signature:

85-0429E (1102-01) Page 1 of 2 Canada

BALLAST WATER TESTING FORM

CANADIAN BALLAST WATER TANK TESTING FORM

VESSEL NAME: _____ IMO #: _____ LPOC: _____

INSPECTION LOCATION _____ DATE: _____ TIME ON: _____ TIME OFF: _____ BWRF (Date/Time) _____

NEXT PORTS OF CALL in Canada or the Great Lakes basin: (1) _____ (2) _____ (3) _____ (4) _____

Inspectors are required to fill-in columns 1-4. Remaining columns to be filled-in only if the origin of water or sediment is of concern (poor exchange, mud, dry or NA)

Tank ID & type	Salinity of sample (PPT)	Depth of sounding (m)	Condition of ballast	Treatment as Reported	Origin of tank contents	If High Risk indicate cause with number(s)	Ballast Mgmt intentions while in Canadian waters (Tank specific)

TOTAL # Ballast Tanks ____ #Pumpable ____ #Unpumpable____ #High Risk Unpumpable Tanks ____ Recommended for Follow-up? Y / N (explain below)

Comments: (label with tank ID for specifics) _____

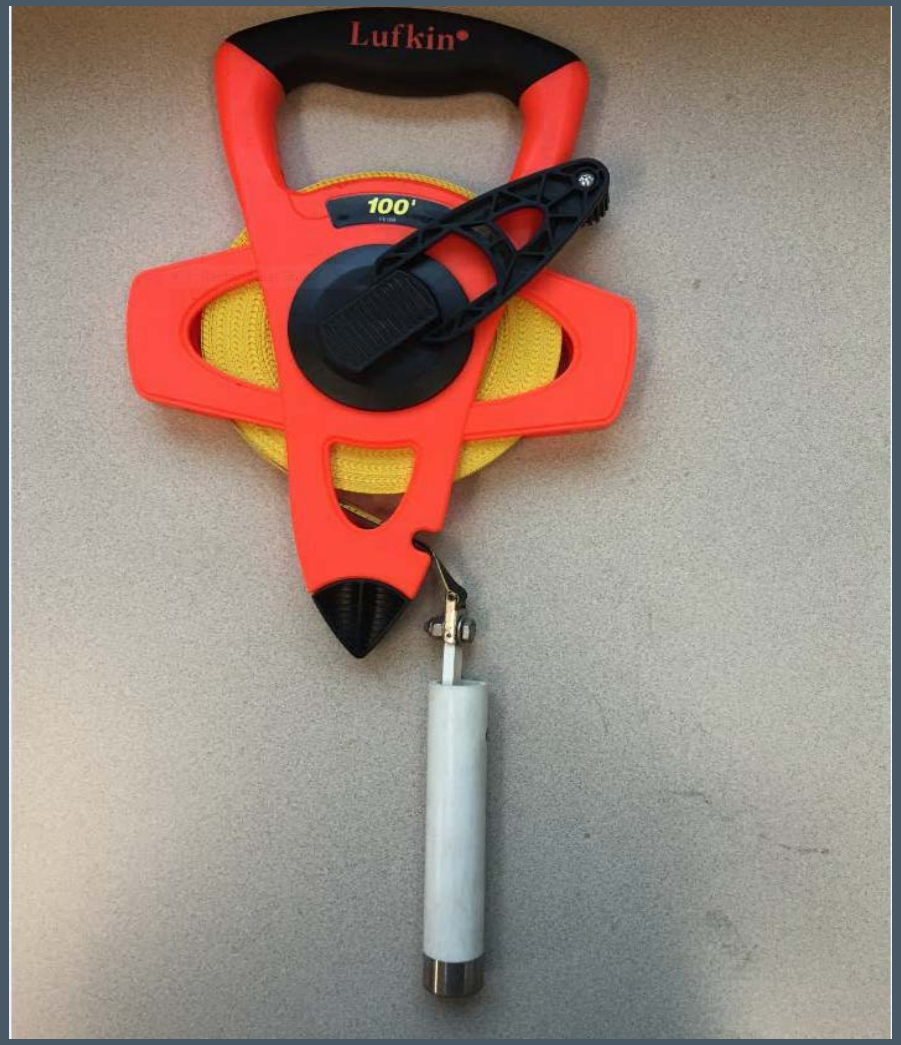
Inspector (TCMS): _____ MASTER: _____

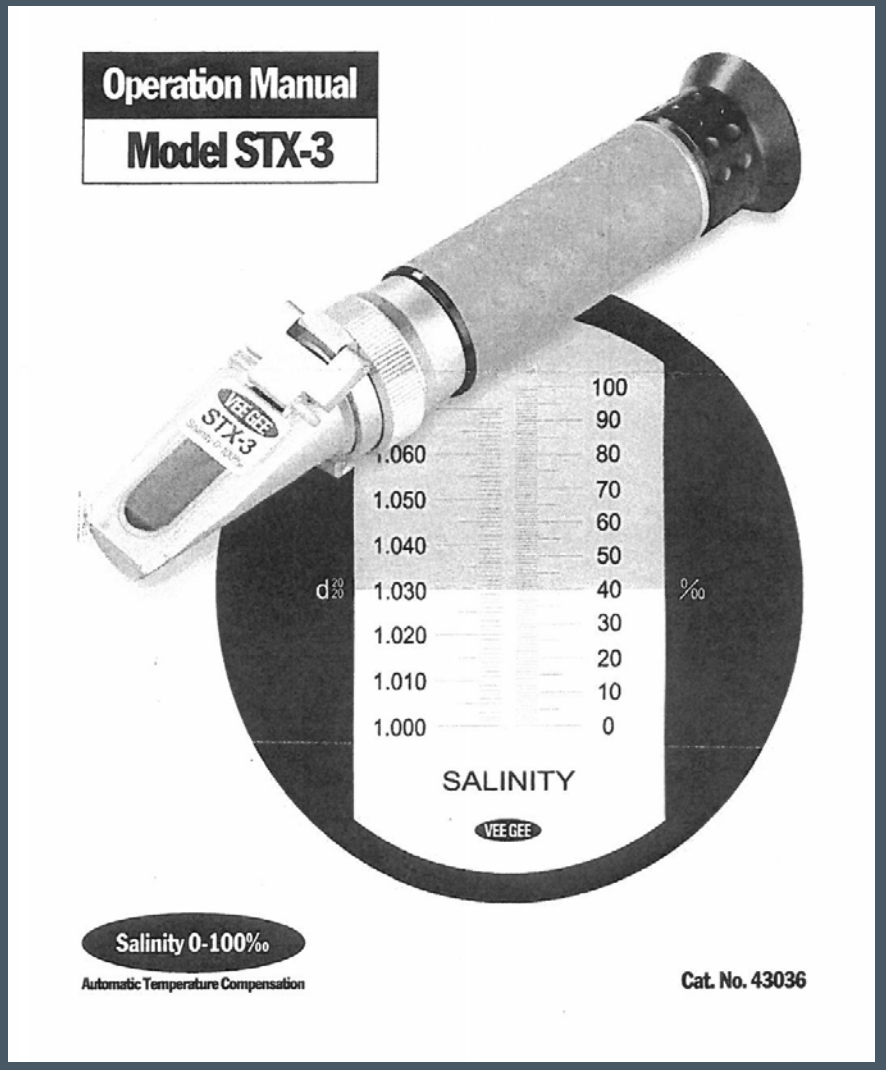
See Legend on Reverse ****Note – Insert Continuation Form**** Rev. November 24, 2009

COLLECTING A SAMPLE

- Guidelines for Sampling (G2):
- The sampling protocol should result in samples that are representative of the whole discharge of ballast water from any single tank or any combination of tanks being discharged
- Samples should be taken from the discharge line, as near to the point of discharge as practicable, during ballast water discharge

SAMPLING / ANALYSIS D - 1



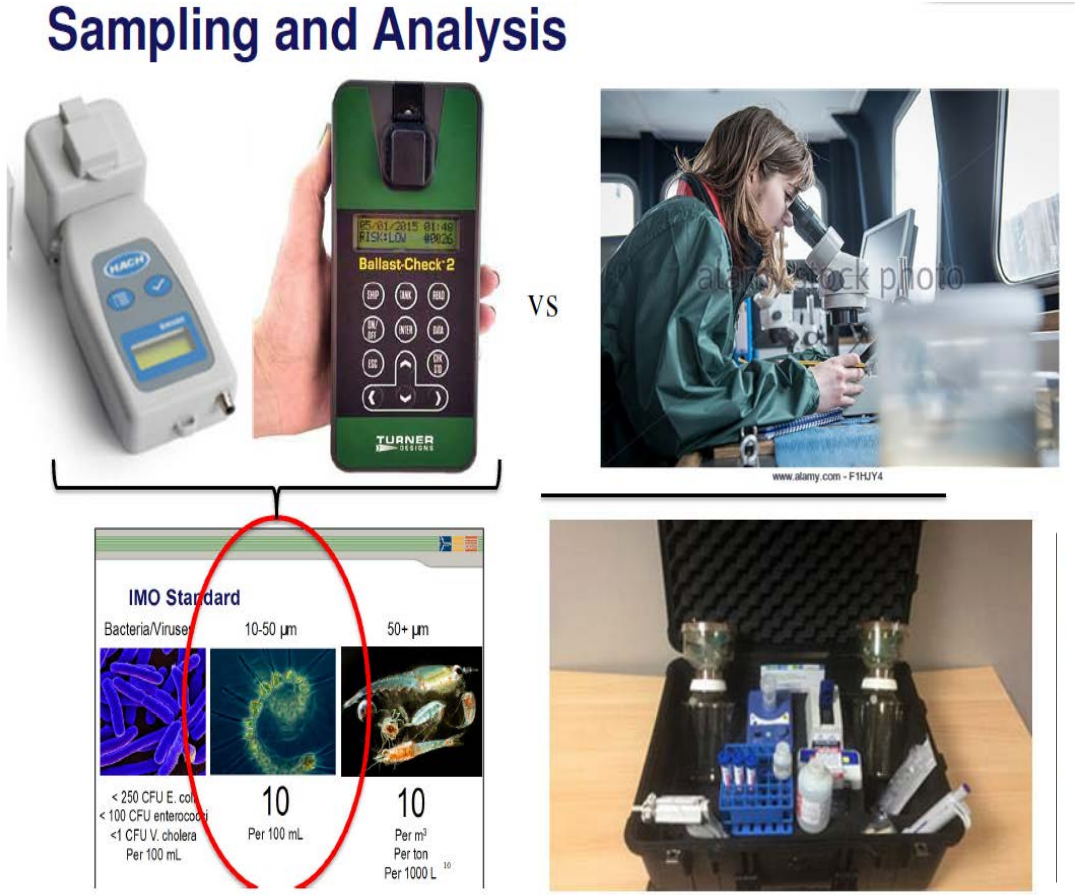


INDIRECT SAMPLING For PSCO

- D-2 Technology
- Onboard alarms on BWTS
- Indirect measure
- Total UVT
- Residual Chlorine / Oxidant
- Electrolytic Voltage
- D-1 Salinity

SAMPLING / ANALYSIS D - 2

- Multiple tools now available for indicative analysis
- Most are based on fluorometry (measure photosynthetic activity by microscopic plants) – indicative of the 10-50 um size class
- Able to detect gross non-compliance
- Results need to put into context considering tool limitations (error)



- The unit is simple to use: Fill the sample cuvette with ballast water, press the button and in about 2 minutes the result is displayed as Low Risk/High Risk/Fail.
- Press the button again to see a Ballast Water Index result – the BWI can be converted to an estimated number of individuals/ml – so it's relatable to the discharge limits. Press the button again to see Fv
- Result – A measure of cell health. DFO has put together step-by-step instructions to use the device and is preparing guidance to help understand what the results mean so that good decisions can be made based on the device output.

Hach BW680 PAM fluorometer

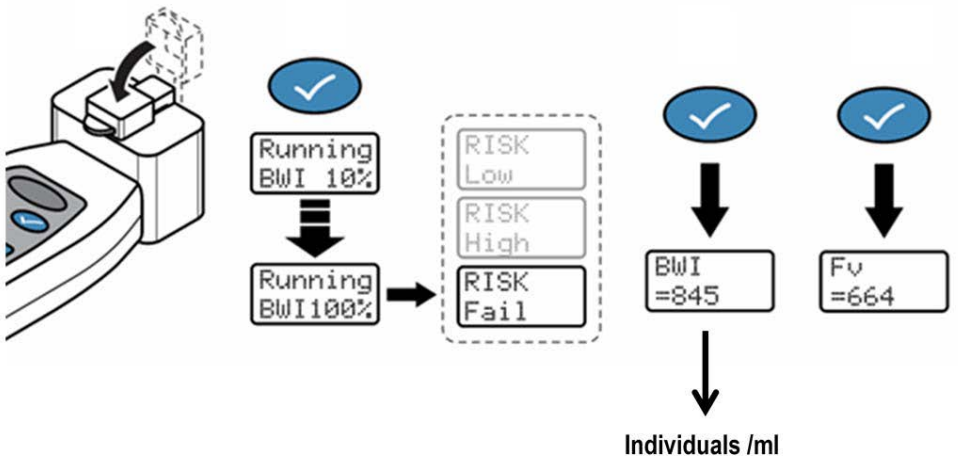


Image Credits: BW680 user manual

ENSURING ENVIRONMENTAL PROTECTION (PSC)

- **The PSC procedure can be described as a four-stage inspection:**

- Initial inspection (Documentation)
- More detailed inspection(On Board Ship)

Sampling Of Ballast Water Tanks (Look for Evidence of exchange)

- Indicative analysis – can be done by inspectors-PSC
- Detailed analysis – delegation to technical Experts

INITIAL INSPECTION

An initial inspection will be to examine the following:

- Check that a valid IBWMC certificate is on board
- Check the approved Ballast Water Management Plan (BWMP) is onboard
- Check the Ballast Water Record Book (BWRB) is on board
- Check that an officer has been nominated to be responsible for the Ballast Water Management System (BWMS) and that the officers and crew are familiar with essential BWM procedures, including the operation of BWMS

MORE DETAILED INSPECTION

A more detailed inspection should include:

- Ballast water management procedure on board the vessel
- Details of specific operational or safety restrictions which effect the ship and or the crew including procedures for safe tank entry
- Details of specific safety aspects of ballast water management system
- Procedures for the disposal of sediments at sea and to shore
- List and/or diagram indicating the locations of sampling and access points in pipelines and ballast water tanks
- Outline the duties of the designated officer as set forth in BWMP
- Details of the record-keeping requirements of the convention in accordance with BWMP

SAMPLING

Ballast water performance standard (Regulation D-2) can be performed in two ways:

- An indicative analysis of ballast water may be undertaken to determine whether a ship is likely to comply with the Convention or not
- A detailed analysis. These are used to determine the viable organism concentration for each of the categories in the D-2 standard

COMPLIANCE AND ENFORCEMENT REGIME

Compliance and Enforcement

Article 8: Violations

Any violation of the requirements of this Convention:

shall be prohibited and sanctions shall be established by the flag state, wherever the violation occurs.

shall be prohibited and sanctions shall be established under the law of each Party.

shall be adequate in severity to discourage violations

Article 9: Inspections

Initial inspection includes: certificate, record book & sampling/analysis

Detailed inspection if ship condition does not match certificate or unfamiliar with (or not doing) procedures

Inspections may be done on request of any other Party if evidence provided

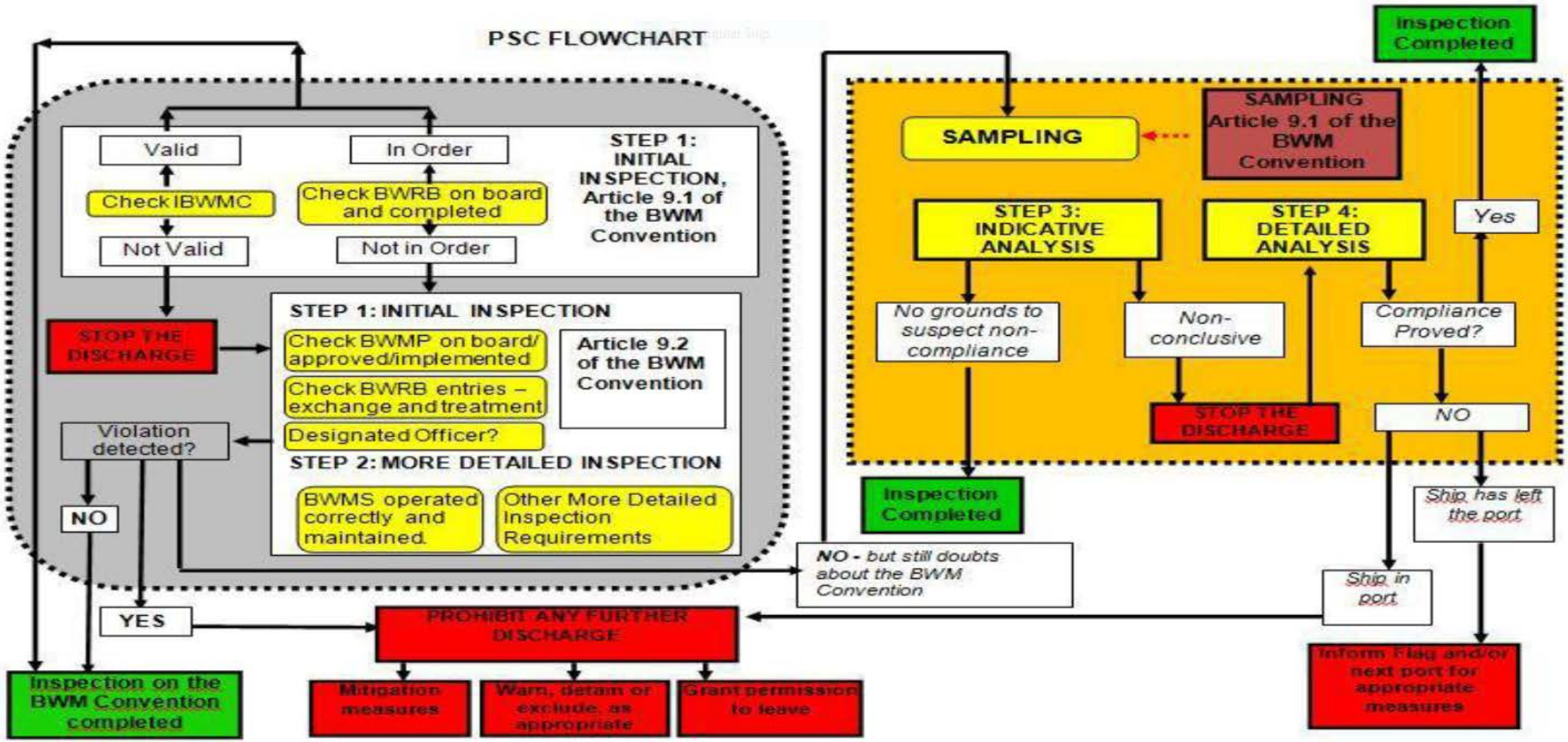
Article 10: Control

Warn, Sanction, Detain, Exclude

may grant such a ship permission to leave the port or offshore terminal for the purpose of discharging Ballast Water or proceeding to the nearest appropriate repair yard or reception facility available, provided doing so does not present a threat of harm to the environment, human health, property or resources

Inspecting Party Must Stop Discharge On Deficiences or Non-Compliant Samples!

PSC Flowchart



CONTROL ACTIONS

If the indicative analysis are not in compliance with the Convention

PSCO shall implement one or more of the following:

- Retention of all ballast water on board
- Require the vessel to undertake any repairs required to the BWMS
- Permit the vessel to proceed to exchange ballast water in a location acceptable to the Administration Allow the vessel to discharge ballast to an appropriate shore reception facility or
- Allow the vessel to treat the ballast water or a portion of it on board in accordance with a method approved by the Port Administration

EXCEPTIONAL CIRCUMSTANCES

Applies to ships unable to manage BW D – 1 / D – 2 due to equipment failure or for safety considerations.

- Must inform Minister of Transport with information at least 96 hours or ASAP before entry into territorial sea.
- The master must ensure that alternative measures are implemented in consultation with the Port State.
- Risk assessment will be carried out.
- Await instructions from Transport Canada.
- Port State to report information re EBP

CONTROL ACTIONS

- If a ship has violated the BWM Convention, the PSCO may take steps to **warn, detain** or **exclude** the ship or grant such a ship **permission to leave to discharge ballast water elsewhere** or **seek repairs** or **reception facility**.

- Non-Penalization under trial period (and experience building phase -> MEPC71

- Port States should refrain from applying criminal sanctions or detaining the ship, based on sampling during the trial period. This does not prevent the port State from taking preventive measures to protect its environment, human health, property or resources

LETTER OF WARNING

Transport Canada Marine Safety | Transports Canada Sécurité maritime

Our File Notre reference
8800-09/ ----

Letter of Warning

Date (YYYY/MM/DD): _____

Port of Inspection: _____

This warning letter is to serve notice on:

The Master or Operator of _____ IMO No. _____

During the inspection of your ballast water management procedures and or/Ballast Water Management Plan, the undersigned inspector has noticed non-compliance with the provision(s) of the Ballast Water Control and Management Regualtions, made under Part 9 of the Canada Shipping Act 2001, as the following:

_____

_____

_____

This Letter of Warning for non-compliance with the "Ballast Water Control and Management Regulations", and the circumstances to which it refers, will form part of the compliance history of your vessel, and will be taken into consideration in case of future violations. You may contest this letter of warning within seven days from the date it was issued to the following address:

Transport Canada - Marine Safety Office at: _____

Phone No.: _____ Fax No. _____

Received by: _____

Marine Safety Inspector: _____ Name: _____

Signature: _____ Signature: _____

Under *"Canada Shipping Act, 2001"* Part 9, Section 191. (1) Every person who, or vessel that, contravenes any of the following commits an offence:
(d) a provision of the regulations (*"Ballast Water Control and Management Regulations"*) made under this Part (Part 9 of CSA 2001), under subsection (2) is liable on summary conviction to a fine of not more than $1,000,000 or to imprisonment for a term of not more than 18 months, or to both.

Canada

LETTER OF RETENTION

Transport Canada Marine Safety | Transports Canada Sécurité maritime

Our File Notre reference
8800-09/----

Letter of Retention

Date (YYYY/MM/DD): _____

Port of Inspection: _____

To: The master or/operator of _____ IMO No. _____

The undersigned Marine Safety Inspector notifying you that during the examination of your ballast water and or/review of your ballast water report, the ballast water in the following tanks, or holds found not in compliance with the provision(s) of the Ballast Water Control and Management Regualtions, made under Part 9 of the Canada Shipping Act 2001, as the following:

_____

_____

_____

Pursuant to Section 4(d), of the Ballast Water Control and Management Regualtions, you are hereby advised not to discharge ballast water from these tanks or holds in Canadian waters unless the ballast water management option(s), in accordance with these Regualtions, has been undertaken, and this Letter of Retention has been rescinded. Until such time, any internal ballast water transfers or addition of on top of the retained ballast water shall be documented in the vessel's logbook, and be conducted in consultation with the Transport Canada Marine Safety Office which has issued this direction. You may contest this Letter of Retention within seven days from the date it was issued to the following address:

Transport Canada - Marine Safety Office at _____

Phone No.: _____ Fax No. _____

Received by: _____

Marine Safety Inspector: _____ Name: _____

Signature: _____ Signature: _____

Under *"Canada Shipping Act 2001"* Part 9, Section 191. (1) Every person who, or vessel that, contravenes any of the following commits an offence:
(d) a provision of the regulations (*"Ballast Water Control and Management Regulations"*) made under this Part (Part 9 of CSA 2001), under subsection (2) is liable on summary conviction to a fine of not more than $1,000,000 or to imprisonment for a term of not more than 18 months, or to both.

Canada

Ballast Water Statistics Pacific Region
Year 2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Year Total
Reports Received from Ships	282	255	294	483	304	343	405	395	391	299	287	293	4031
Ballast Water Inspections	22	30	30	32	28	38	42	39	45	28	42	48	424
Salinity Testing	11	14	10	9	5	7	11	10	5	8	15	12	117
Verbal Warning												0	0
Letter of Warning (LOW)							2	1			1	0	4
Letter of Retention (LOR)				1								0	1
Administrative Monetary Penalty (AMP)												0	0
Prosecution												0	0
Inspector												CG	

Ballast Water Statistics Pacific Region

Year 2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Year Total
Reports Received from Ships	291	288	315	310	378	405	400	433	361	319	291		3791
Water Inspections	27	40	32	38	38	36	33	60	50	27	22		403
Salinity Testing	11	12	13	15	16	11	13	26	18	8	4		147
Verbal Warning					1								1
Letter of Warning (LOW)	2					1	1		1				5
Letter of Retention (LOR)									1				1
Administrative Monetary Penalty (AMP)													0
Prosecution													0

BALLAST WATER STATISTICS (2017)

Ballast Water Statistics Pacific Region
Year 2017

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Year Total
Reports Received from Ships	287	268	283	317	412	291	451	395	334	348	334	293	4013
Water Inspections	38	37	58	46	53	63	68	58	38	39	24	29	551
Salinity Testing	14	20	27	15	21	22	35	20	15	15	10	9	223
Verbal Warning													0
Letter of Warning (LOW)					1	1	3			1	1		7
Letter of Retention (LOR)					1					1			2
Administrative Monetary Penalty (AMP)													0
Prosecution													0
BWTS INSPECTED			8										
BWTS DATA			20										

1. Isnpected - details obtail of lay outs and sampling points with photoies
2. BWTS Data - Information from ships type, make details.

4

ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

NEI Treatment Systems, LLC
Attn: Mr. John D. Bradley
Chief Executive Officer
249 E. Ocean Boulevard, Suite 500
Long Beach, CA 90802

ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE

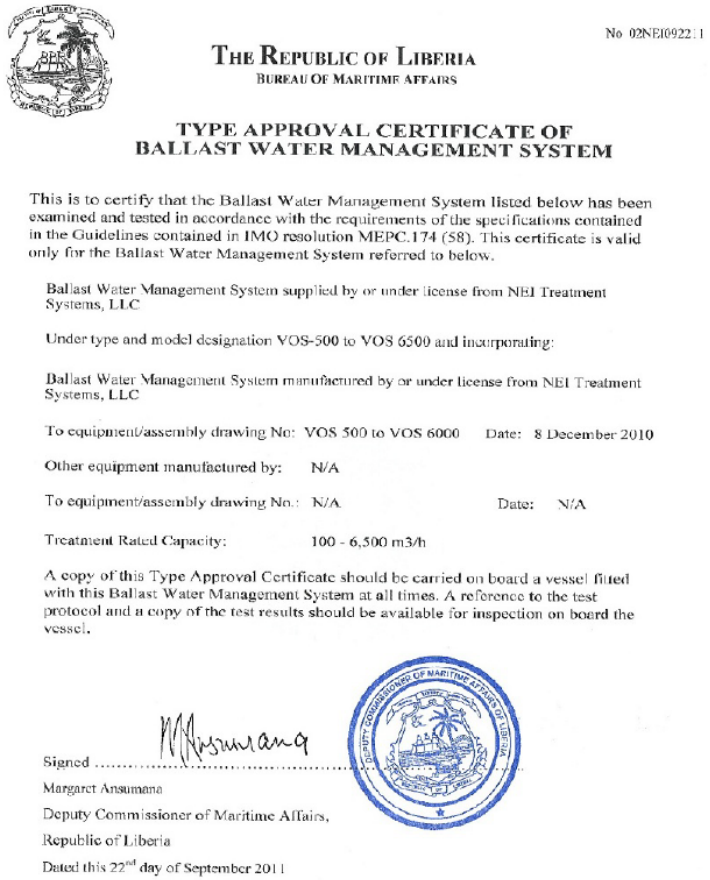
The Coast Guard has completed its review of the Alternate Management System (AMS) application submitted by NEI Treatment Systems, LLC, for the Venturi Oxygen System (VOS) ballast water treatment system (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 for VOS models VOS-500 to -6000 with ballast water treatment rated capacities of 100 to 6,500 cubic meters/hour (m3/hr), as type approved by the Netherlands Ministry of Transport, Public Works, and Water Management, and as detailed in type approval certificate No. 6698/2011 issued on July 18, 2011, and expiring July 18, 2016. AMS acceptance is based on this type approval certificate issued by the Netherlands Ministry of Transport, Public Works, and Water Management.

VOS models have also been issued type approval certificates from the following:

- The Bureau of Maritime Affairs of the Republic of Liberia under type approval certificate No. 2NEI092211 issued September 22, 2011, for VOS models VOS-500 to -6000;
- The Office of the Maritime Administrator of the Marshall Islands under an un-numbered type approval certificate issued August 6, 2011, for VOS models VOS-500 to -6000;
- The Panama Maritime Authority under type approval certificate No. TA-0001 issued February 11, 2010, for the VOS-2500 model with a treatment rated capacity of 2,500 m3/hr;
- The Government of Malta under an un-numbered type approval certificate issued January 19, 2010, for the VOS-2500 model with a treatment rated capacity of 2,500 m3/hr.

The VOS BWTSs are assigned the following AMS identification number:

TYPE APPROVAL CERTIFICATE



No 02NEI0922.1

THE REPUBLIC OF LIBERIA
BUREAU OF MARITIME AFFAIRS

TYPE APPROVAL CERTIFICATE OF BALLAST WATER MANAGEMENT SYSTEM

This is to certify that the Ballast Water Management System listed below has been examined and tested in accordance with the requirements of the specifications contained in the Guidelines contained in IMO resolution MEPC.174 (58). This certificate is valid only for the Ballast Water Management System referred to below.

Ballast Water Management System supplied by or under license from NEI Treatment Systems, LLC

Under type and model designation VOS-500 to VOS 6500 and incorporating:

Ballast Water Management System manufactured by or under license from NEI Treatment Systems, LLC

To equipment/assembly drawing No: VOS 500 to VOS 6000 Date: 8 December 2010

Other equipment manufactured by: N/A

To equipment/assembly drawing No.: N/A Date: N/A

Treatment Rated Capacity: 100 - 6,500 m3/h

A copy of this Type Approval Certificate should be carried on board a vessel fitted with this Ballast Water Management System at all times. A reference to the test protocol and a copy of the test results should be available for inspection on board the vessel.

Signed .....

Margaret Ansumana

Deputy Commissioner of Maritime Affairs,

Republic of Liberia

Dated this 22nd day of September 2011

TYPE APPROVAL COMPLIANCE CERTIFICATE

BALLAST WATER MANAGEMENT SYSTEM

TYPE APPROVAL COMPLIANCE CERTIFICATE

This is to certify that the Ballast Water Management System listed below was examined and tested in accordance with the requirements of the specifications contained in the Guidelines contained in IMO Resolution MEPC.174 (58). This Type Approval Compliance Certificate is valid only for the Ballast Water Management System referred to below.

Ballast Water Management System supplied by or under licence from:	NEI Treatment Systems, LLC
Under type and model designation	VOS-2500
and incorporating:	
Ballast Water Management System manufactured by or under licence from:	NEI Treatment Systems, LLC
To equipment/assembly drawing No.:	07-2500-101 *Date:* 29 August 2007
Other equipment manufactured by:	--
To equipment/assembly drawing No.:	-- *Date:* --
Treatment Rated Capacity:	2,500 m³/h

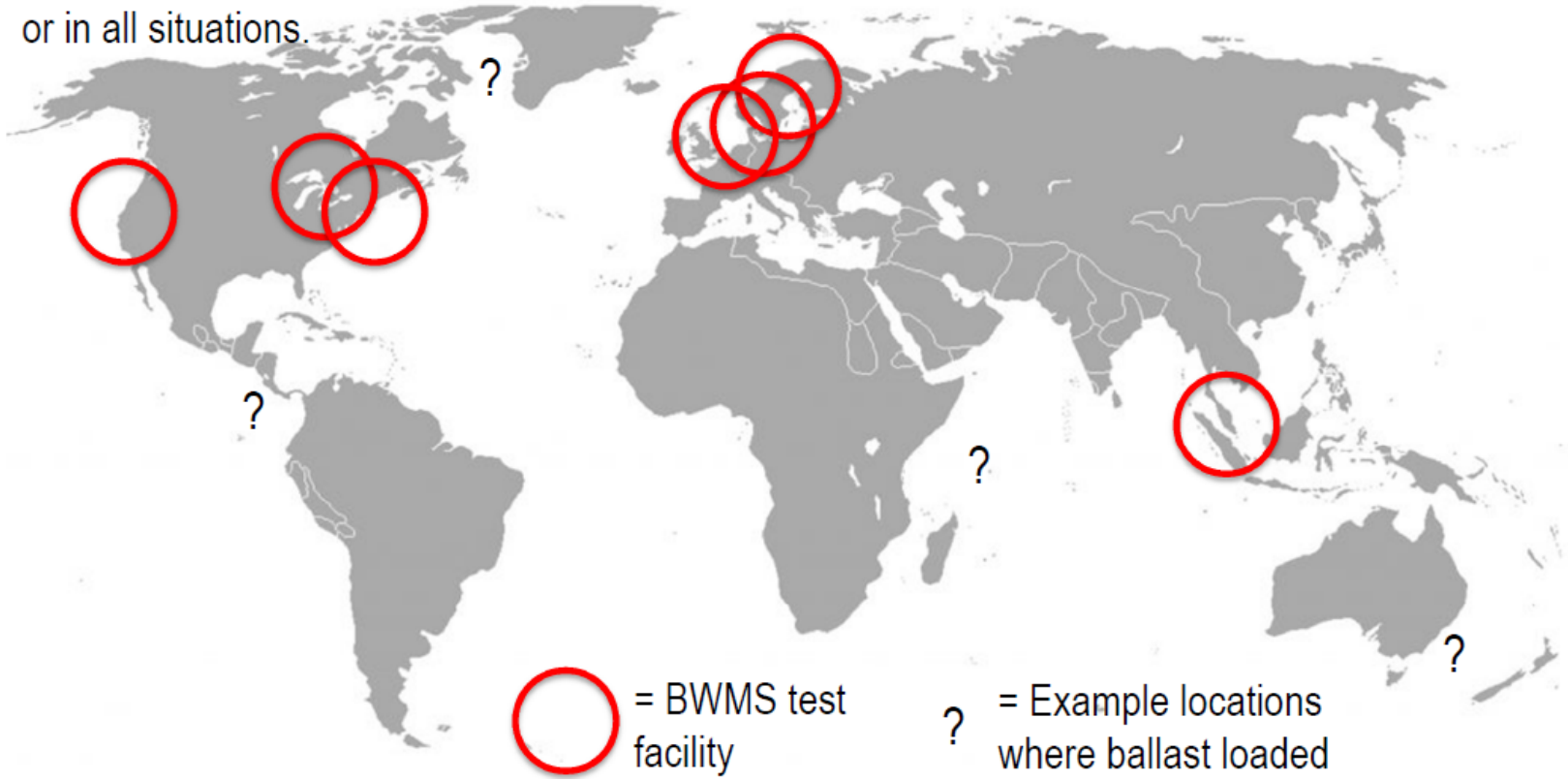
A copy of this Type Approval Compliance Certificate should be carried on board a vessel fitted with this Ballast Water Management System at all times. A reference to the test protocol and a copy of the test results should be available for inspection on board the vessel.

No Limiting Conditions imposed.

This Type Approval Compliance Certificate is based on the Type Approval Certificate No. 02 NEI 070809 issued by the Republic of Liberia on 8 July 2009.

TYPE APPROVAL

Organisms differ worldwide and BWMS cannot be tested everywhere. Approval screens out BWMS that can't meet D-2 where tested. Approval does not mean a BWMS will work on all ships or in all situations.



INTERNATIONAL BALLAST WATER MANAGEMENT CERTIFICATE (Flag State)

INTERNATIONAL BALLAST WATER MANAGEMENT CERTIFICATE

PANAMA MARITIME AUTHORITY

Issued under the provisions of the International Convention for the Control and Management of Ships Ballast Water and Sediments (hereinafter referred to as "the Convention") under the authority of the Goverment of

BWMC-001542

THE REPUBLIC OF PANAMA

By The Merchant Marine General Directorate of the Panama Maritime Authority

Particulars of ship

Name of Ship	Call Sign	IMO Number	Port of Registry
GLOBAL ECHO	3FBK5	9633288	PANAMA

Gross Tonnage	Date of Construction	Ballast Water Capacity
17019.00	September 06, 2010	15847.41 m3

Detail of Ballast Water Management Method(s) used

Method of Ballast Water Management Used
Sequential Method

Name of Manufacturer	Date Installed (If Applicable)
N/A	N/A

The principal Ballast Water Management method(s) employed on this ship is/are

[X] In accordance with regulation D-1 [ ] In accordance with regulation D-4

[ ] In accordance with regulation D-2 (Describe): N/A

THIS IS TO CERTIFY:

1. That the ship has been surveyed in accordance with regulation E-1 of the Annex to the Convention; and
2. That the survey shows that Ballast Water Management on the ship complies with the Annex to the Convention.

This certificate is valid until **June 28, 2022** subject to surveys in accordance with regulation E-1 of the Annex to the Convention.

Completion date of the survey on which this certificate is based: **June 29, 2017**

Issued : **September 08, 2017** at **SEGUMAR - PANAMA**
(Date of issue) *(Place of issue of certificate)*

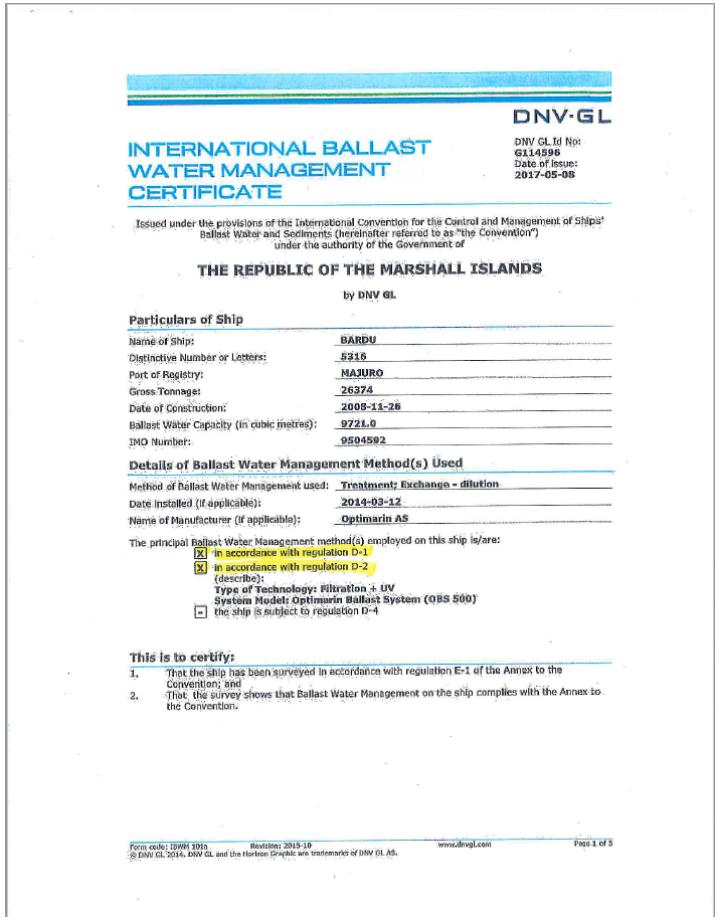
Arnulfo A. González S.

ENG. ARNULFO GONZALEZ
TECHNICAL OFFICER

UTN:BWMC-001542

(page 1 of 4)

INTERNATIONAL BALLAST WATER MANAGEMENT CERTIFICATE (DNV - GL)



DNV·GL

INTERNATIONAL BALLAST WATER MANAGEMENT CERTIFICATE

DNV GL Id No: G114596
Date of issue: 2017-05-08

Issued under the provisions of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (hereinafter referred to as "the Convention") under the authority of the Government of

THE REPUBLIC OF THE MARSHALL ISLANDS

by DNV GL

Particulars of Ship

Name of Ship:	BARDU
Distinctive Number or Letters:	5316
Port of Registry:	MAJURO
Gross Tonnage:	26374
Date of Construction:	2008-11-26
Ballast Water Capacity (in cubic metres):	9721.0
IMO Number:	9504592

Details of Ballast Water Management Method(s) Used

Method of Ballast Water Management used:	Treatment: Exchange - dilution
Date installed (if applicable):	2014-03-12
Name of Manufacturer (if applicable):	Optimarin AS

The principal Ballast Water Management method(s) employed on this ship is/are:

[X] in accordance with regulation D-1
[X] in accordance with regulation D-2
(describe):
Type of Technology: Filtration + UV
System Model: Optimarin Ballast System (OBS 500)
[ ] the ship is subject to regulation D-4

This is to certify:

1. That the ship has been surveyed in accordance with regulation E-1 of the Annex to the Convention; and
2. That the survey shows that Ballast Water Management on the ship complies with the Annex to the Convention.

Form code: IBWM 101a Revision: 2015-10 www.dnvgl.com Page 1 of 5
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CERTIFICATE OF COMPLIANCE WITH BWMC

DNV·GL

CERTIFICATE OF COMPLIANCE WITH THE INTERNATIONAL BALLAST WATER MANAGEMENT CONVENTION

DNV GL Id No:
31983
Date of issue:
2017-03-10

Issued under the provisions of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (hereinafter referred to as "the Convention")
under the authority of the Government of

THE HONG KONG SPECIAL ADMINISTRATIVE REGION OF THE PEOPLE'S REPUBLIC OF CHINA

by **DNV GL**

Particulars of Ship

Name of Ship:	**SEASPAN ZAMBEZI**
Distinctive Number or Letters:	**HK-4073**
Port of Registry:	**HONG KONG**
Gross Tonnage:	**112967**
Date of Construction:	**2013-09-26**
Ballast Water Capacity (in cubic metres):	**31530.4**
IMO Number:	**9630406**

Details of Ballast Water Management Method(s) Used

Method of Ballast Water Management used:	**Treatment**
Date installed (if applicable):	**2014-06-30**
Name of Manufacturer (if applicable):	**RWO GmbH Marine Water Technology**

The principal Ballast Water Management method(s) employed on this ship is/are:

- [-] in accordance with regulation D-1
- [X] in accordance with regulation D-2
  (describe):
  Type of Technology: Filtration + Electrolysis
  System Model: CleanBallast 1000
- [-] the ship is subject to regulation D-4

This is to certify:

1. That the ship has been surveyed in accordance with regulation E-1 of the Annex to the Convention; and
2. That the survey shows that Ballast Water Management on the ship complies with the Annex to the Convention.

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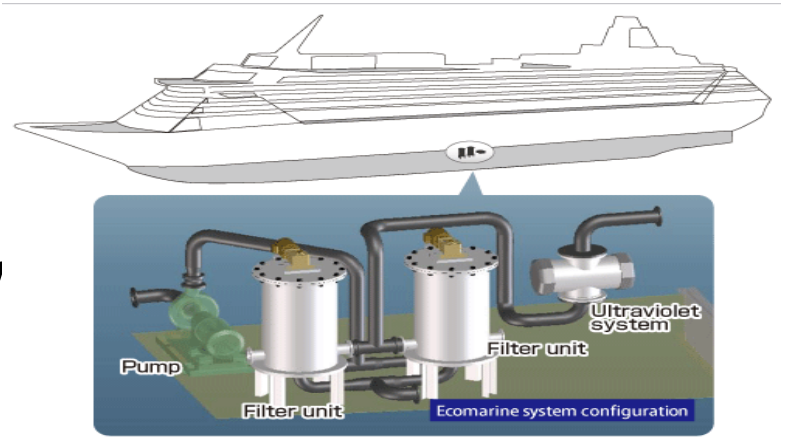
RATIONALE FOR TREATMENT SYSTEMS



- Quantitative discharge standard
- Less influence of weather, ship structure, crew
- More uniform protection across habitat types
- Currently ~66 different treatment systems, based on 11 treatment processes: Filtration, Ultraviolet Light, ozone, Biocides, Electro-chlorination
- Most have multiple treatment steps: Filtration+UV
- All treatment systems must be type approved by the International Maritime Organization (and USCG)

TYPE OF TREATMENT

Mechanical treatment:

- Filtration, cyclonic separation and electro-mechanical separation

Physical treatment:

- Ultraviolet irradiation (UV), Cavitation / De-oxygenation and ultrasound

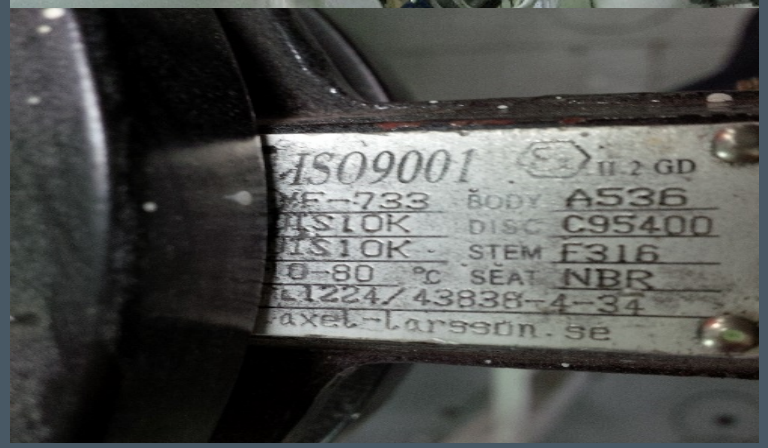
Chemical treatment:

- Active Substances Ozone generation, Electro chlorination

BALLAST WATER TREATMENT SYSTEM

SAMPLING POINTS

SAMPLE POINTS



Sampling / Analysis D-2

- Taken from BW during discharge
- Representative of the whole discharge
- Sampling Ports supplied by shipyards often not consistent with Protocols under Guidelines G(2)

STATUS OF SAMPLING PROGRAM

- Samples collected on 17 ships with 9 different BWMS as of October 2017

Manufacturer	Model	Uptake Action	Discharge Action
Alfa Laval	Pure Ballast 3.0	Filtration+UV	UV
Hyde Marine	Guardian	Filtration+UV	UV
JFE	Ballast ACE	Filtration+Chlorine	Neutralizer
MAHLE	Ocean Protection Sysytem	Filtration(2)+UV	UV
Panasia	GloEn Patrol	Filtration+UV	UV
RWO	Clean Ballast	Filtration+Electrolysis	Electrolysis
Headway Marine	Ocean Guard	Filtration+AEOP	AEOP+Neutralizer
NK-03	Blue Ballast System	Ozone	Neutralizer
TechCross	Electro-clean	Electro+Chlorination	Neutralizer

BALLAST WATER SYSTEM INFORMATION

Ballast Water System Information

1. Vessel Name: ---------- 2. Arrival / Departure Time: ----------

3. IMO Number: ---------- 4. Make / M'frer BWTS: ----------

5. Model of BWTS: ---------- 6. Type Approval Certificate: ----------

7. Type of water the system can operate in.

(a) Fresh Water (b) Brackisk Water (c) Salt Water

8. Is the System Operational. YES NO

9. Is the Crew trained & familiarized to operate the BWTS plant. YES NO

10. Diameter of Ballast pipe, at the location of the sample port (inch or mm)

11. Information about the sample port:

- Describe the sample port – flange is blanked off or ball valve is present

- Diameter of the flange

- Type of flange (a) DIN (b) ANSI (c) JIS standard)

- Size of ball valve if present and thread type (a) NPT (b) BSP

12. Location accessibility:

- Ideal (accessible by personal with a clear area of approx 1 x 1 x 2.5 m (Width Length Height)

- Challenging (below deck plating, accessible only by ladder, or located with minimal clearance)

13. Pictures of sample port and location of sampling points in pipelines & tanks, if possible.

14. Comments

LIST OF BALLAST WATER SYSTEMS

MANUFACURER	MODEL
Y - unspecified	Y - unpsecified
No BWTS on board	No BWTS on board
Alfa-Laval AB	PureBallast
Ahead Ocean Technology (Dalian) Co., Ltd.	AHEAD-BWMS
AQUA Eng. Co., Ltd.	AquaStar BWMS
AURAMARINE LTD.	CrystalBallast Ballast Water Management System
Azienda Chimica Genovese (ACG)	ECOLCELL BTs Ballast Water Management System
Bawat A/S	Bawat BWMS
BIO-UV SAS	BIO-SEA
BIO-UV SAS	BIO-SEA® Ballast Water Treatment System
Cathelco LTD	Cathelco Ballast Water Management System - A2
Coldharbour Marine Ltd.	Coldharbour GLDTM Ballast Water Management System, incorporating types SeaGuardianTM IGG500 to IGG6000
COSCO Shipbuilding Industrial Campany	Blue Ocean Shield
Daliam Marine University	DMU OH BWMS
DESMI Ocean Guard A/S	DESMI Ocean Guard Ballast Water Treatment System
DESMI Ocean Guard A/S	Ray CleanTM BWTS
Ecochlor, INC.	Ecochlor BWT system
Ecomarine Technology Research Association	ECOMARINE EC BWTS
Elite Marine Ballast Water Treatment System Corp.	Seascape Ballast Water Management System
Envirotech and Consultancy Pte. Ltd.	BlueSeas BWMS
Envirotech and Consultancy Pte. Ltd.	BlueWorld BWMS
ERMA FIRST	ERMA FIRST BWMS
Evonik Industries AG	Evonik Ballast Water Treatment System with PERACLEAN Ocean
Evoqua Water Technologies LLC	SeaCURE BWMS SC-1500/1
GEA Westfalia Separator Group Gmbh	Ballast Master ultraV
GEA Westfalia Separator Group Gmbh	Ballast Master ecoP
Hanla IMS Co., Ltd.	EcoGuardian System
Hitachi Plant Technologies, Ltd.	ClearBallast
HWASEUNG R&A Co. Ltd.	HS-BALLAST
Hyde Marine Inc.	Hyde GUARDIAN
JFE Engineering Corporation	JFE BallastAce (NEO-CHLOR MARINE)
Jiangsu Nanji Machinery Co., Ltd.	NiBallast BWMS
Jiangsu Nanji Machinery Co., Ltd.	NiBallast Ballast Water Management System
Jiujiang Precision Measuring Technology Research Institute	OceanDoctor
KADALNEER TECHNOLOGIES PTE.LTD.	VARUNA
KALF Engineering Pte. Ltd.	ElysisGuard
Knutsen Ballatvann AS	KBAL Ballast Water Management System
Korea Top Marine (KT Marine) Co., Ltd.	MARINOMATE (ex. KTM-BWMS)
Kuraray Co., Ltd.	MICROFADE
Kurita Water Industries Ltd.	KURITA
Kwang San Co. Ltd.	En-Ballast System

BALLAST WATER TREATMENT SYSTEM REPORT

BALLAST	IMO	VESSEL NAME	BWMS on board	VESSEL TYPE	NPOC	ETA	LPOC 1
Y	9714812	SBI TETHYS	Ocean Guard HMT - 1000x2	BULK CARRIER	VANCOUVER (VAN), CANADA (CAN)	01-Feb-2017 10:00 UTC	NAKHODKA (NJK), RUSSIAN FEDEF
Y	9693408	TRADE UNITY	TechCross Electro Clean System (450B + 1000B)	BULK CARRIER	PRINCE RUPERT (PRR), CANADA (CAN)	05-Feb-2017 07:30 UTC	ULSAN (USN), KOREA, REPUBLIC C
N	9605231	MSC ARBATAX	Alfa Laval PureBallast	CONTAINER SHIP (FULLY CELLULAR)	VANCOUVER (VAN), CANADA (CAN)	06-Feb-2017 04:00 UTC	OAKLAND (KND), UNITED STATES (
Y	9748253	DREAM ISLAND	Alfa Laval PureBallast 3.0 Model 600	BULK CARRIER	PRINCE RUPERT (PRR), CANADA (CAN)	06-Feb-2017 07:00 UTC	LANSHAN (LSN), CHINA (CHN)
N	9229398	NEW CENTURY 1	Alfa Laval Pureblast 3.0/3.0X	CAR CARRIER	NEW WESTMINSTER (NWE), CANADA (CAN)	08-Feb-2017 16:00 UTC	PORTLAND (OREGON) (PDX), UNITE (USA)
Y	9613850	SAGA FRIGG	Optimarin AS	GENERAL CARGO SHIP	VANCOUVER (VAN), CANADA (CAN)	09-Feb-2017 10:00 UTC	LOS ANGELES (LAX), UNITED STAT
Y	9758777	NANCY PETERKIN / BARGE: KIRBY 185-01	ALFA Laval Pureballast 3.0 BW, Model 1000	ARTICULATED PUSHER TUG	VANCOUVER (VAN), CANADA (CAN)	10-Feb-2017 01:00 UTC	ANACORTES (OTS), UNITED STATE
Y	9782247	FIRST SKY	Kuraray Microfade 001	BULK CARRIER	VANCOUVER (VAN), CANADA (CAN)	10-Feb-2017 22:00 UTC	TADOTSU (TAD), JAPAN (JPN)
N	9613848	SAGA FALCON	Optimarin Ball Sys 1	GENERAL CARGO SHIP	VANCOUVER (VAN), CANADA (CAN)	11-Feb-2017 18:00 UTC	ULSAN (USN), KOREA, REPUBLIC C
N	9472127	COSCO FORTUNE	EVOqua Seacure 0001	CONTAINER SHIP (FULLY CELLULAR)	PRINCE RUPERT (PRR), CANADA (CAN)	12-Feb-17	YANGSHAN (CHINA)
N	9515474	IRIS ACE	Miura HK-400	VEHICLES CARRIER	NEW WESTMINSTER (NWE), CANADA (CAN)	13-Feb-2017 06:00 UTC	HITACHI (HTC), JAPAN (JPN)
N	9603594	BALAO	Optimarin	CONTAINER SHIP (FULLY CELLULAR)	VANCOUVER (VAN), CANADA (CAN)	16-Feb-2017 09:30 UTC	SUVA (SUV), FIJI, THE REPUBLIC OI
Y	9665841	ORIENT BECRUX	Panasia GloEnPatrol	BULK CARRIER	NANAIMO (NNO), CANADA (CAN)	18-Feb-2017 16:30 UTC	VOSTOCHNYY PORT (VYP), RUSSIA
No data	9687215	BUENA VENTURA	TechCross Electro Clean System (450B + 1000B)	BULK CARRIER	VANCOUVER (VAN), CANADA (CAN)	20-Feb-2017 04:00 UTC	LONG BEACH (LB3), UNITED STATE
N	9720512	MSC MICHELA	Panasia - GP -001	CONTAINER SHIP (FULLY CELLULAR)	ROBERT'S BANK (RTB), CANADA (CAN)	20-Feb-2017 19:30 UTC	OAKLAND (KND), UNITED STATES (
Y	9701231	CAMILA	TechCross Electro Clean System (450B + 1000B)	BULK CARRIER	PRINCE RUPERT (PRR), CANADA (CAN)	21-Feb-2017 12:00 UTC	TAICANG (TAG), CHINA (CHN)
N	9477880	OOCL CANADA	Headway - Ocean Guard	CONTAINER SHIP (FULLY CELLULAR)	VANCOUVER (VAN), CANADA (CAN)	22-Feb-2017 02:00 UTC	SEATTLE (SEA), UNITED STATES O
Y	9719355	TS DELTA	COSCO Bos05	NA	STEWART (STW), CANADA (CAN)	22-Feb-2017 06:00 UTC	CHIBA (CHB), JAPAN (JPN)
N	9737149	GLOBAL AGLAIA	Alfa Laval	BULK CARRIER	NEW WESTMINSTER (NWE), CANADA (CAN)	24-Feb-2017 06:00 UTC	ENSENADA (ESE), MEXICO (MEX)
N	9720524	MSC CLEA	Panasia GloEnPatrol	CONTAINER SHIP (FULLY	VANCOUVER (VAN), CANADA	27-Feb-2017 15:00	OAKLAND (KND), UNITED STATES (

DETAINABLE DEFICIENCIES

The following non-exhaustive list of deficiencies should be considered to be of such nature that may warrant the **Detention** of a ship:

- Absence of a IBWMC
- Absence of a BWMP
- Absence of a BWRB
- Indication that the vessel or its equipments do not correspond substantially with the particulars of the IBWMC and/or BWMP
- The designated personnel are not familiar with essential shipboard procedures relating to ballast water management

DETAINABLE DEFICIENCIES

- No ballast water management procedures have been implemented on board.
- No Designated Officer has been nominated.
- The ship has not complied with the BWMP for management and treatment of ballast water
- Absence, serious deterioration or failure of proper operation of equipment required under the BWMP
- Result of non-compliance by sampling
- Ballast water has been discharged other than in accordance with the regulations of the BWM Convention
- (Regulation A-2)

DEFICIENCIES CODES

- 14801-BWMP-Missing/not approved/incorrect/not updated/incorrect language
- 14802-BWRB–Missing/not properly filled/incorrect language
- 14803–Construction dates applicable for BWM–Not as required
- 14804-BallastWaterExchange–Not carried out as required/not as required/inoperative/not properly maintained
- 14805-Sedimentremoval–not carried out/not as required

DEFICIENCIES CODES

- 14806-Crewtrainingandfamiliarization–Lack of familiarity
- 14807–Performance standard not met-Insufficient/missing/not approved
- 14808–Proto type ballast water treatment-Not approved/expired
- 14809-Conditionsforexemption–Invalid/expired/incorrect/
- missing/not properly filled
- 14810–Ballast Water discharge violation in port-Not as required/expired/incorrect/missing exemption
- 14811-BWMS–malfunction/not properly maintained
- 14899-Other

CONCLUSION

- The joint efforts and Cooperation of all Stakeholders will contribute to:
  - Proper ballast water management practices;
  - The protection of our waters from the introduction of harmful aquatic organisms and pathogens; and
  - Prevent delays and constraints to ships.

REFERENCES

PMOU - Port State Control Committee Instruction 48/2015/13

TMOU - Guidance to Port State Control Officers for verifying Compliance with the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

MEPC 71

THANK YOU FOR YOUR ATTENTION