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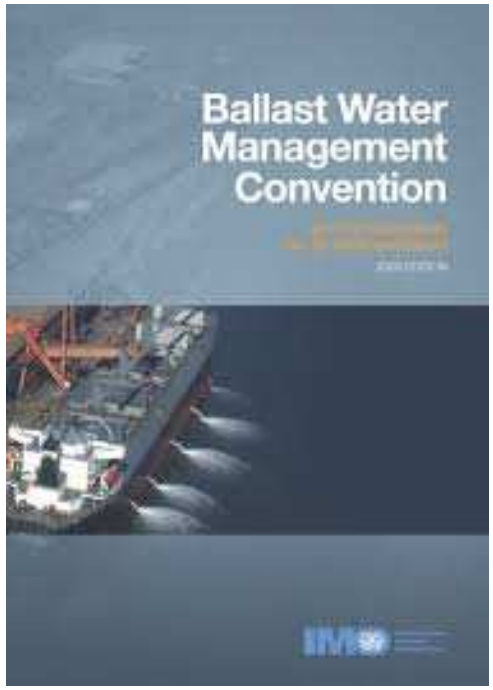
From planning to survey to sign-off to compliance for the life-cycle of your ship.



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Your Integration / Service Partner

Ballast Water Management in the USA

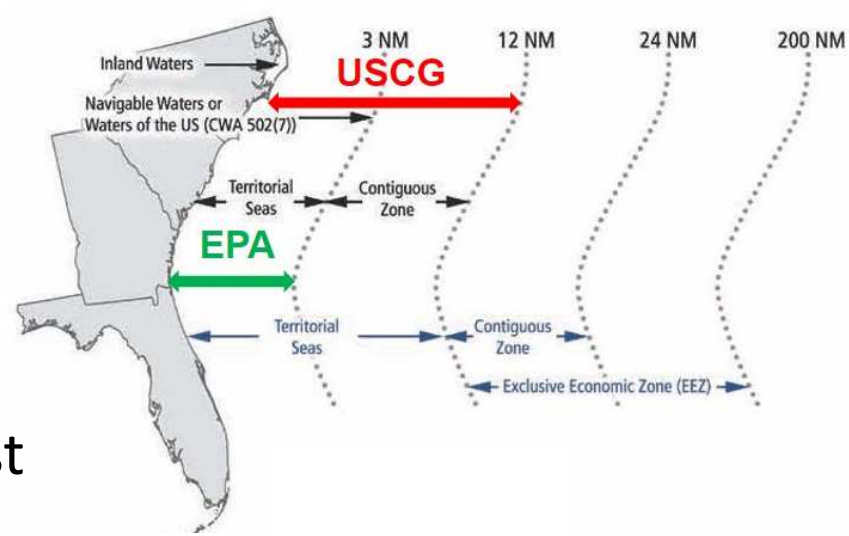
Debra DiCianna, Senior Compliance Engineer

Overview

- Ballast Water Management (BWM) requirements in the USA
- Comparison of USA and BWM Convention type approval
- Type Approved BWMS
- USCG Extensions and Compliance Strategy Plans
- Next Steps – Preparing for Compliance

US BWM Requirements

- The United States has not ratified the BWM Convention and has established independent ballast water regulations
- In the US, ships must be in compliance with:
  - USCG Ballast Water Regulations;
  - US EPA Vessel General Permit (VGP); and
  - Individual State requirements – 16 States have ballast water requirements (California is the most stringent)
- BWMS require new testing and type approval by the USCG
- General requirements for Ballast Water Management (BWM) practices, reporting, and recordkeeping.



USCG BWM Options

U.S. Drinking Water

No Discharge

BWM Options

USCG Type Approved BWMS

Temporary Options

BWE

USCG Extensions

USCG Accepted AMS

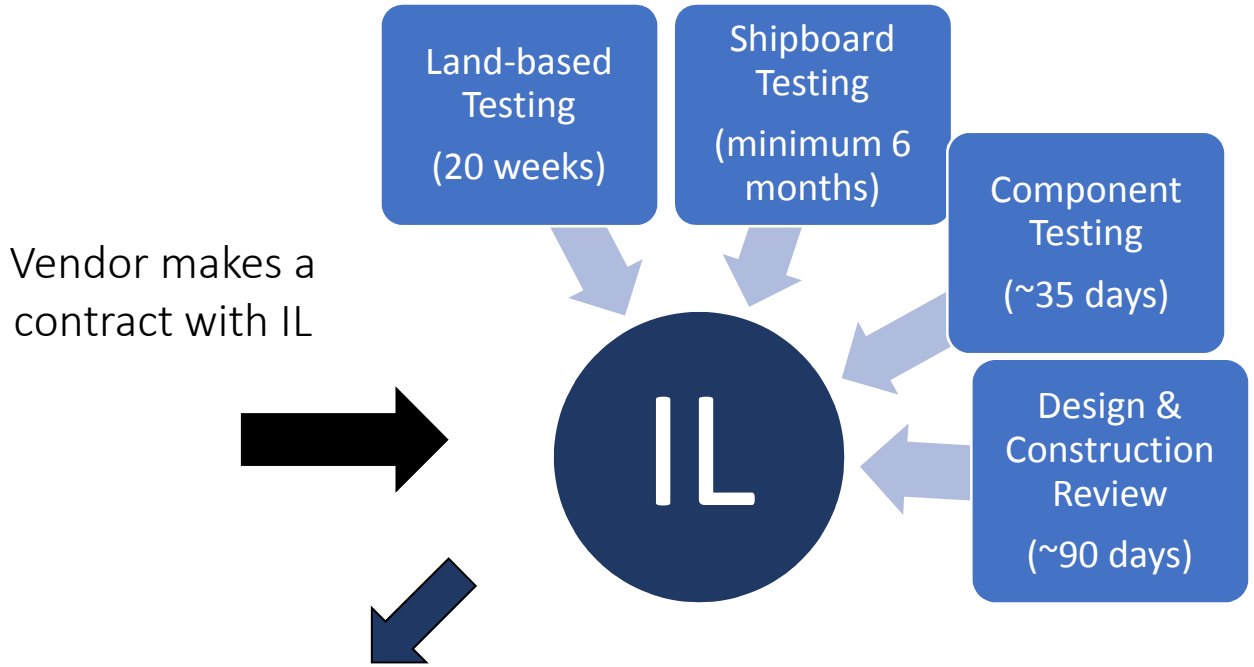
On-shore Treatment

US BWM Regulations

Vessel	Ballast Capacity	Compliance Date
New	All	Delivery
Existing	< 1,500 m^3	First Scheduled Drydocking after 1 January 2016
	1,500 – 5,000 m^3	First Scheduled Drydocking after 1 January 2014
	> 5,000 m^3	First Scheduled Drydocking after 1 January 2016
Notes: New vessel – constructed on or after 1 December 2013 CG-OES Policy Letter No. 13-01, Revision 2 (16 November 2015) - "An underwater inspection in lieu of drydocking (UWILD) is not considered the "first scheduled drydocking".		

- Compliance dates are based on vessel drydocking
- USCG granting extensions due to shipowner limitations on applicable USCG type approved BWMS

USCG Type Approval



Vendor makes a contract with IL

Testing may occur in parallel, but the same exact model needs to be used for all testing.

IL Review and Test Report Generation
(~90 days)

USCG Marine Safety Center Review
(~90 days)

USCG Type Approval Awarded

Approximately 18 – 24 months

Note: Process is confidential until award of USCG type approval

Land-based Test Comparison

	USCG and ETV Protocol	Newly Revised IMO G8 (Resolution MEPC.279(70) (To be mandatory code)
Test Cycles	5 consecutive, valid and successful replicate test cycles for any salinity in which approval is requested.	5 consecutive successful test cycles in each salinity
Sample Frequency/Location	• Before Treatment • After Treatment • After 1 day holding time or required treatment time	• Update • Treatment • Storage • Discharge New regrowth testing procedures
Augmentation	ETV identifies procedures for augmentation. No salinity amendments.	Test water should be natural. Any augmentation with DOC, POC, or TSS to be approved by Administration.
Scaling	Downsizing addressed. No details on upsizing.	Administration to verify that any scaled model. At a minimum, the shipboard test should allow for further validation - preferably selected at the upper limit of the rated capacity of the BWMS.

Land-based Test Comparison (con't)

		USCG and ETV Protocol	Newly Revised IMO G8 (Resolution MEPC.279(70)
Sample Volume	Organisms ≥ 50 µm	10 m^3	Influent: 1 m^3 Effluent: 3 m^3
	50 µm > Organisms ≥ 10 µm	3 m^3	10 L
	Bacteria	1000 mL	500 mL
Salinity Definitions	Freshwater	<1 PSU	<1 PSU
	Brackish Water	10 – 20 PSU	10 – 20 PSU
	Saltwater	28 – 36 PSU	28 – 36 PSU (Test separated by 10 PSU)
Challenge Conditions	DOC	6 mg/L	> 1 mg/ to > 5 mg/l
	POC	4 mg/L	> 1 mg/ to > 5 mg/l
	TSS	24 mg/l	> 1 mg/ to > 50 mg/l

Note: Blue colored text are new changes in testing requirements.

Shipboard Testing Comparison

	USCG and ETV Protocol	Newly Revised IMO G8 (Resolution MEPC.279(70)
Duration and Number of samples	Not less than 6 months. 5 consecutive valid test cycles.	Not less than 6 months. The 6-month period starts and ends with completion of a successful test cycle or invalid test cycle that meets Regulation D-2. The 3 consecutive tests should be "suitably separated".
Scaling	Not addressed.	Shipboard test should allow for further validation - preferably selected at the upper limit of the rated capacity of the BWMS.

BWMS Update

	Actions
MEPC 70	October 2016 – Adopts 2016 Guidelines for approval of ballast water management system (G8) (Resolution MEPC.279(70))
USCG BWMS Type Approval (TA)	December 2016 – Optimarin, Alfa Laval PureBallast 3, and OceanSaver MkII March 2017 – USCG posting official type approval certificates on Ballast Water homeport webpage (http://homeport.uscg.mil/ballastwater) May 2017 – USCG revises Alfa Laval PureBallast 3 to include additional UV reactors
USCG BWMS TA Packages Submitted	January 27, 2017 – BalClor™ March 31, 2017 – Ecochlor® Ballast Water Treatment System April 11, 2017 - ERMA FIRST
USCG Actions	March 6, 2017 – Marine Safety Information Bulletin Ballast Water Management (BWM) Extension Program Update (OES MSIB No.: 003/17) USCG increasing denials of extension applications

Type Approved BWMS

Ballast Water Management Systems	Number of Systems
Available or in-development	100+
Type Approval Certificate verifying compliance with MEPC.174(58)	69*
Type Approved BWMS – Explosion Proof	8
IMO Final Approval	9
IMO Basic Approval	17
USCG Type Approval	3
USCG Accepted Alternate Management System (AMS)	58 BWMS by 53 manufacturers

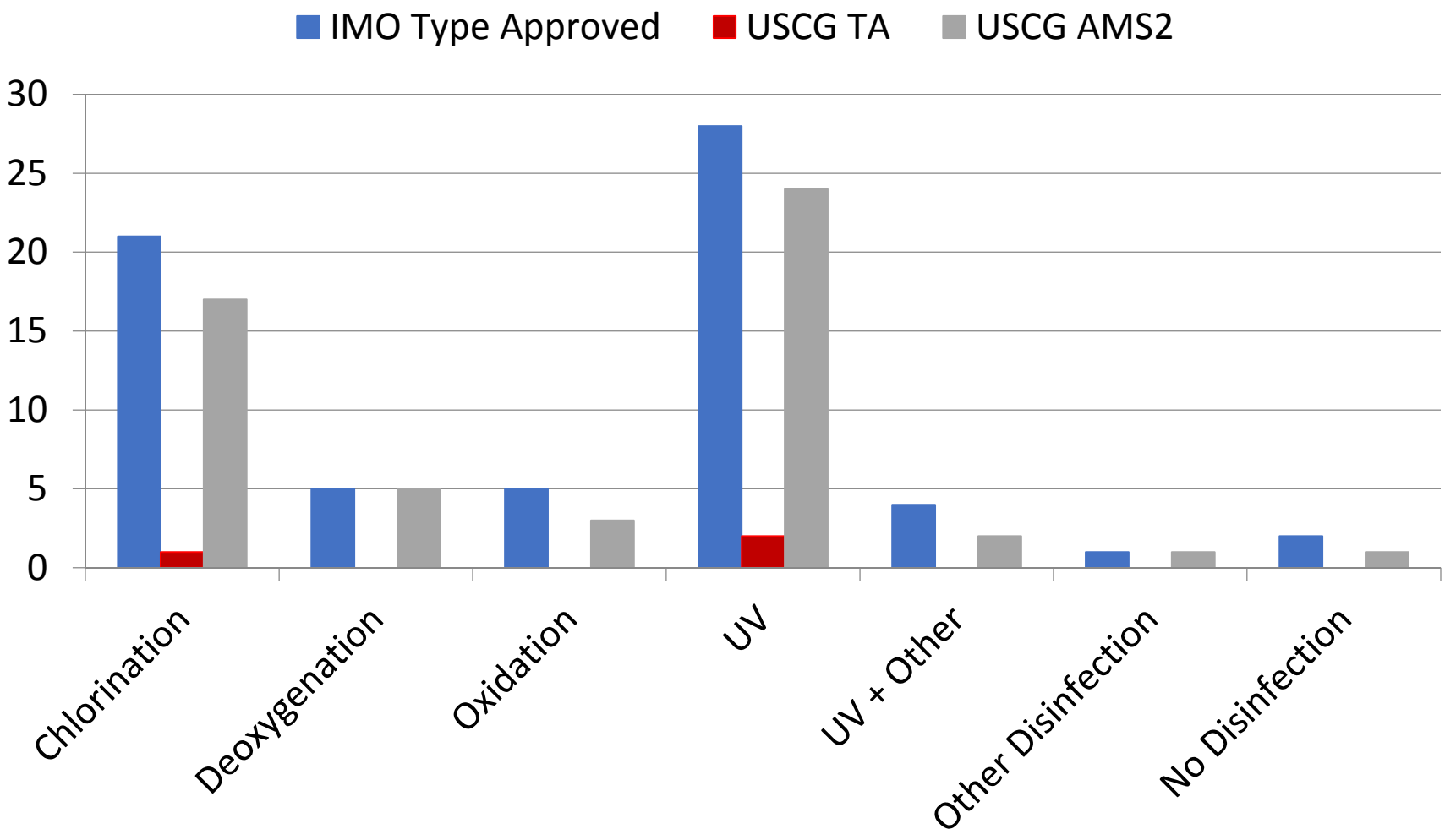
* The number reflects verified approvals for a BWMS manufacturer – not the number of specific models approved and excludes 1 system removed from the market

General Information

Category	All Type Approved BWMS	USCG Type Approved	USCG AMS
No. of BWMS	69*	3	58
Explosion Proof Models	8	3[a]	8
BWMS requiring treatment during intake and de-ballasting	63	3	55
BWMS using active substances	31	1	24
BWMS requiring storage of chemicals	28	1	23
BWMS with waste products	3	1	1
Maximum Capacity (m^3/h)*	16,200	7,200	16,200

Notes:
*Excludes one BWMS no longer available
[a]Only one BWMS is approved for installation in a hazardous area of a US-flagged vessel.

Disinfection Technologies



USCG Accepted Alternate Management System (AMS)

- If installed prior to USCG Type Approved BWMS, AMS may be used for 5-years from the vessel's specific compliance date.

USCG Accepted AMS – 58 BWMS by 53 Manufacturers		
Ahead	Ecochlor®	NK-O3 BlueBallast®
Aquarius™-EC	EcoGuardian	Ocean Protection System
Aquarius™-UV	ECOMARINE	OceanDoctor
AquaStar™*	Electro-Cleen™*	OceanGuard™
ARA PLASMA	ERMA FIRST	OceanSaver® MKII
BalClor™	FineBallast MF	Optimarin*
BallastMaster UltraV	GloEn-Patrol™*	OxyClean
BALPURE®	HiBallast*	PACT Marine BWTS
Bawat	Hyde GUARDIAN™	PureBallast
BIO-SEA®	HY™-BWMS	(Models 250 - 2500, 2.0(Ex), 3.0/3.1(EX))
BioViolet	JFE BallastAce®	Purimar™ *
Blue Ocean Shield	(using NEO-CHLOR MARINE™	RayClean™
Blue Zone™	and TG Ballastcleaner)	SeaCURE™
BSKY™	KBAL	Seascape
Cathelco	MARINOMATE	Sky-System
CleanBallast®	MICROFADE™	Smart Ballast
Coldharbour GLD	Miura BWMS	Trojan Marinex
CrystalBallast®	MMC BWMS	YP BWMS
Cyeco BWMS	NEI VOS	USCG list (1 May 2017)
EcoBallast™	NiBallast™	* EX model included

Comparison of USCG TA BWMS

	Optimarin	PureBallast 3	OceanSaver MkII
Model for Shipboard Testing	1000 m^3/h	1000 m^3/h	2 x 2000 m^3/h
Salinity Augmentation	None	None	Augmentation Needed 20 PSU; 17°C
Holding Time	3 days	72 hours	None
Waste Requiring Disposal	Used UV Lamps	Used UV Lamps	Electrolytic Cell Cleaning Fluid
Approximate Model Comparison			
Footprint – 500 m^3/h	Filter = 0.60 m^2 UV = 1.63 m^2	Filter = 0.39 m^2 UV = 0.65 m^2 CIP = 0.64 m^2	Filter = 0.72 m^2 C2E = 4.84 m^2
Footprint – 3000 m^3/h	Filter = 2.06 m^2 UV = 3.22 m^2	Filter = 1.67 m^2 UV = 2.93 m^2 CIP = 0.64 m^2	Filter = 4.62 m^2 C2E = 9.90 m^2

BWM Convention vs. USCG TA Certificates

	Optimarin	PureBallast 3	OceanSaver MkII
Changes to Disinfection Process	• Operate at full power • Increased minimum UV intensity (UVI)	• Operate at full power • Increased UVI • Flow reduction when UVI at upper and lower limit	Increased Total Residual Oxidant (TRO) concentration – from 2.5 mg/l to > 3 mg/l
Holding Time	3 days	72 hours	No Change
Filters	Limited to Boll & Kirch (testing planned for Filtrex and FilterSafe)	Limited to Filtrex	MossHydro and FilterSafe (FilterSafe Turbo - limited flow rate)

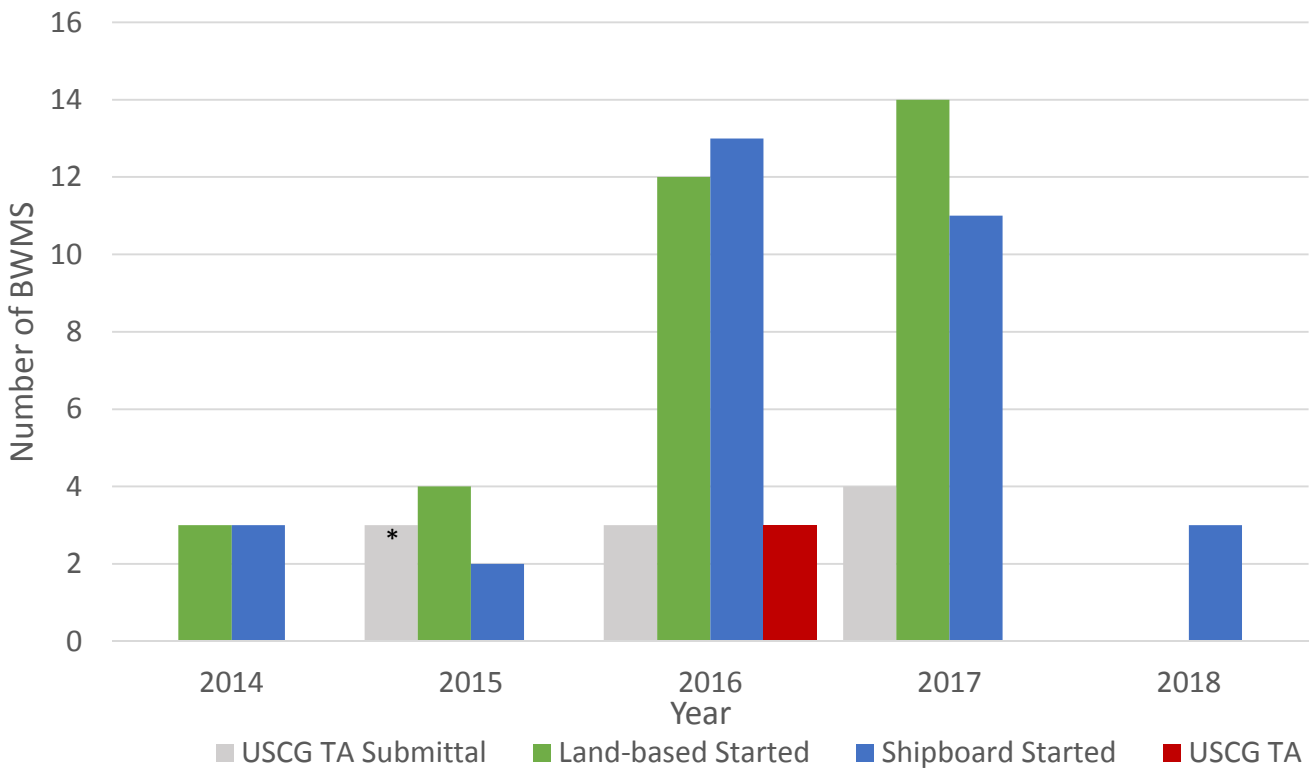
Further USCG TA Testing

	Vendor Identified Additional Areas for Testing
Optimarin	• Reduced holding time • Additional filters – FilterSafe and Filtrex • Explosion proof components for US. Flagged vessels • Revised G8 (MEPC.279(70)
PureBallast 3	• Revised G8 (MEPC.279(70)
OceanSaver MkII	• Revised G8 (MEPC.279(70)

USCG TA Applications Under Review

	BalClor	Ecochlor®	ERMA FIRST
Treatment Sequence	Uptake: Filtration and electrochlorination Discharge: Neutralization	Uptake: Filtration and Chlorine Dioxide Treatment	Uptake: Filtration, Full-flow electrolysis Discharge: Neutralization
Manufacturer	SunRui China	Ecochlor, Inc. USA	ERMA FIRST ESK Engineering Solutions S.A. Greece

Progress in USCG TA Testing



Note: * MPN Method used for counting organisms – USCG denied request

Source: Survey of BWMS Vendors
(data as of 20 April 2017)

2017 USCG Testing Outlook

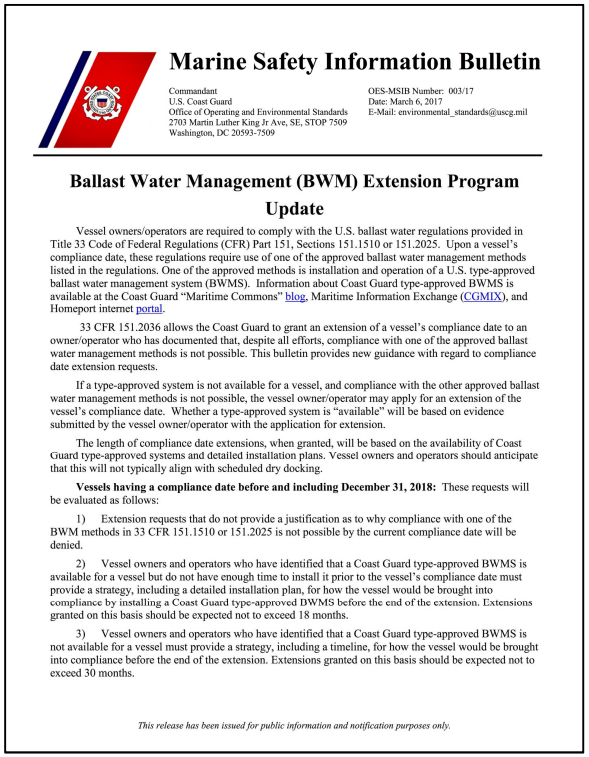
- One additional BWMS vendor may be submitting USCG type approval package
- Many BWMS state that USCG testing is starting in 2017
- Many UV-based BWMS are conducting new testing to CMFDA/FDA

Testing to Revised G8

- Discussed with DNV-GL process of type approving USCG type approved BWMS to revised G8 (Resolution MEPC.279(70))
  - On-going effort
  - Need revision of G9 to respond to freshwater testing of active substances
  - Need to align temperature range testing
- Scaling
  - Revised G8 may be more stringent than USCG type approval
    - "4.16 At a minimum, the shipboard test unit should be of a capacity that allows for further validation of the mathematical modelling and/or calculations for scaling, and preferably selected at the upper limit of the rated capacity of the BWMS, unless otherwise approved by the Administration."

USCG Extensions

- Extensions will no longer be to drydocking dates
- Need to submit comprehensive compliance plan with timeline that outlines steps to be undertaken.
- Compliance strategy plan to describe:
  - Availability of BWMS and drydocking facilities
  - Technical issues
  - Feasibility studies
  - Detailed design
  - Class approval



Marine Safety Information Bulletin

Commandant
U.S. Coast Guard
Office of Operating and Environmental Standards
2703 Martin Luther King Jr Ave, SE, STOP 7509
Washington, DC 20593-7509

OES-MSIB Number: 003/17
Date: March 6, 2017
E-Mail: environmental_standards@uscg.mil

Ballast Water Management (BWM) Extension Program Update

Vessel owners/operators are required to comply with the U.S. ballast water regulations provided in Title 33 Code of Federal Regulations (CFR) Part 151, Sections 151.1510 or 151.2025. Upon a vessel's compliance date, these regulations require use of one of the approved ballast water management methods listed in the regulations. One of the approved methods is installation and operation of a U.S. type-approved ballast water management system (BWMS). Information about Coast Guard type-approved BWMS is available at the Coast Guard "Maritime Commons" blog, Maritime Information Exchange (CGMIX), and Homeport internet portal.

33 CFR 151.2036 allows the Coast Guard to grant an extension of a vessel's compliance date to an owner/operator who has documented that, despite all efforts, compliance with one of the approved ballast water management methods is not possible. This bulletin provides new guidance with regard to compliance date extension requests.

If a type-approved system is not available for a vessel, and compliance with the other approved ballast water management methods is not possible, the vessel owner/operator may apply for an extension of the vessel's compliance date. Whether a type-approved system is "available" will be based on evidence submitted by the vessel owner/operator with the application for extension.

The length of compliance date extensions, when granted, will be based on the availability of Coast Guard type-approved systems and detailed installation plans. Vessel owners and operators should anticipate that this will not typically align with scheduled dry docking.

Vessels having a compliance date before and including December 31, 2018: These requests will be evaluated as follows:

1) Extension requests that do not provide a justification as to why compliance with one of the BWM methods in 33 CFR 151.1510 or 151.2025 is not possible by the current compliance date will be denied.

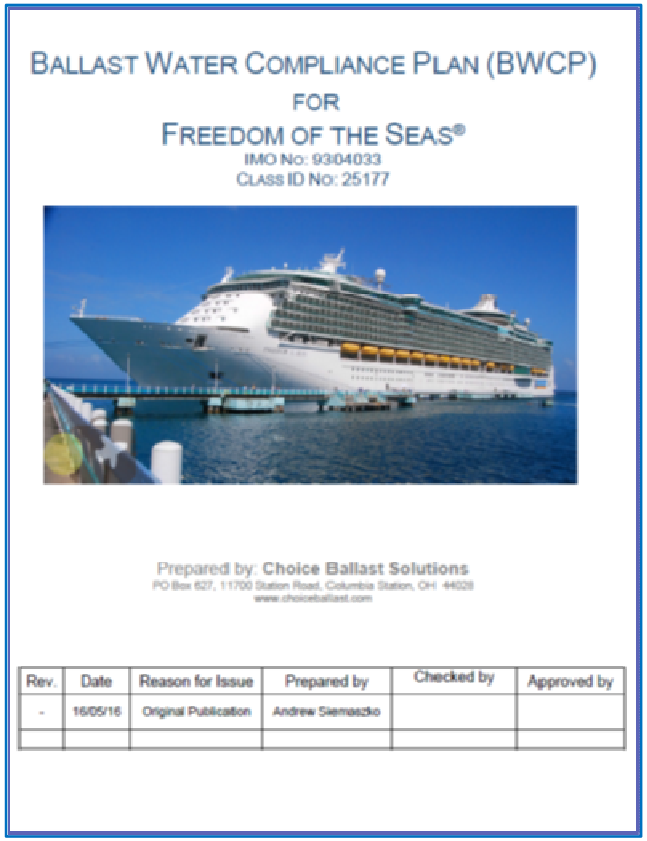
2) Vessel owners and operators who have identified that a Coast Guard type-approved BWMS is available for a vessel but do not have enough time to install it prior to the vessel's compliance date must provide a strategy, including a detailed installation plan, for how the vessel would be brought into compliance by installing a Coast Guard type-approved BWMS before the end of the extension. Extensions granted on this basis should be expected not to exceed 18 months.

3) Vessel owners and operators who have identified that a Coast Guard type-approved BWMS is not available for a vessel must provide a strategy, including a timeline, for how the vessel would be brought into compliance before the end of the extension. Extensions granted on this basis should be expected not to exceed 30 months.

This release has been issued for public information and notification purposes only.

Important Next Steps

- Ensure BWMP is on board the vessel.
- Be prepared for the unexpected
- Develop a compliance strategy
  - BWMS design and installation needs to be carefully prepared
  - Contingencies for non-performance need to be addressed
- Document:
  - All discussions with BWMS vendors, engineering firms, and drydocks
  - Operational issues with BWMS
- Keep up-to-date with all developments
- Team with trusted partners
- Comprehensive BWMS design, installation and commissioning requires 18 to 24 months.


BALLAST WATER COMPLIANCE PLAN (BWCP)
FOR
FREEDOM OF THE SEAS®
IMO No: 9304033
CLASS ID No: 25177

Prepared by: Choice Ballast Solutions

Rev.	Date	Reason for Issue	Prepared by	Checked by	Approved by
-	16/05/16	Original Publication	Andrew Siemaszko		

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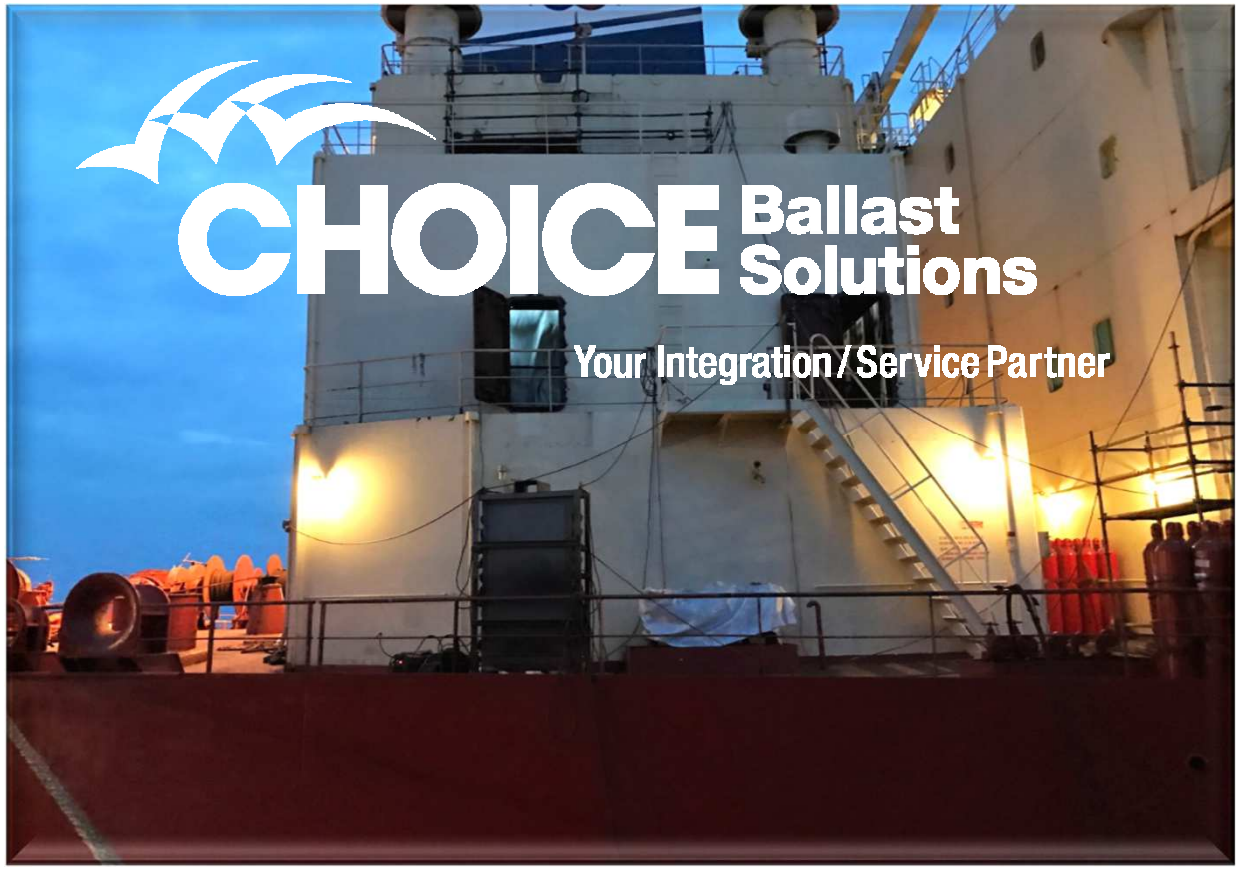

Choice Ballast provides:

- Fleet Evaluation,
- BWMS Selection,
- Compliance/Regulatory Planning,
- Feasibility Studies, Surveys,
- 3D Laser Scanning,
- Design Engineering,
- Detailed Design,
- Project Management,
- Installation Oversight,
- BWM Plans and
- Vessel Support Services

Thank you!

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