



BWM - Confitarma Information day

Present stand and US operation challenges - Rome 21 May 2019

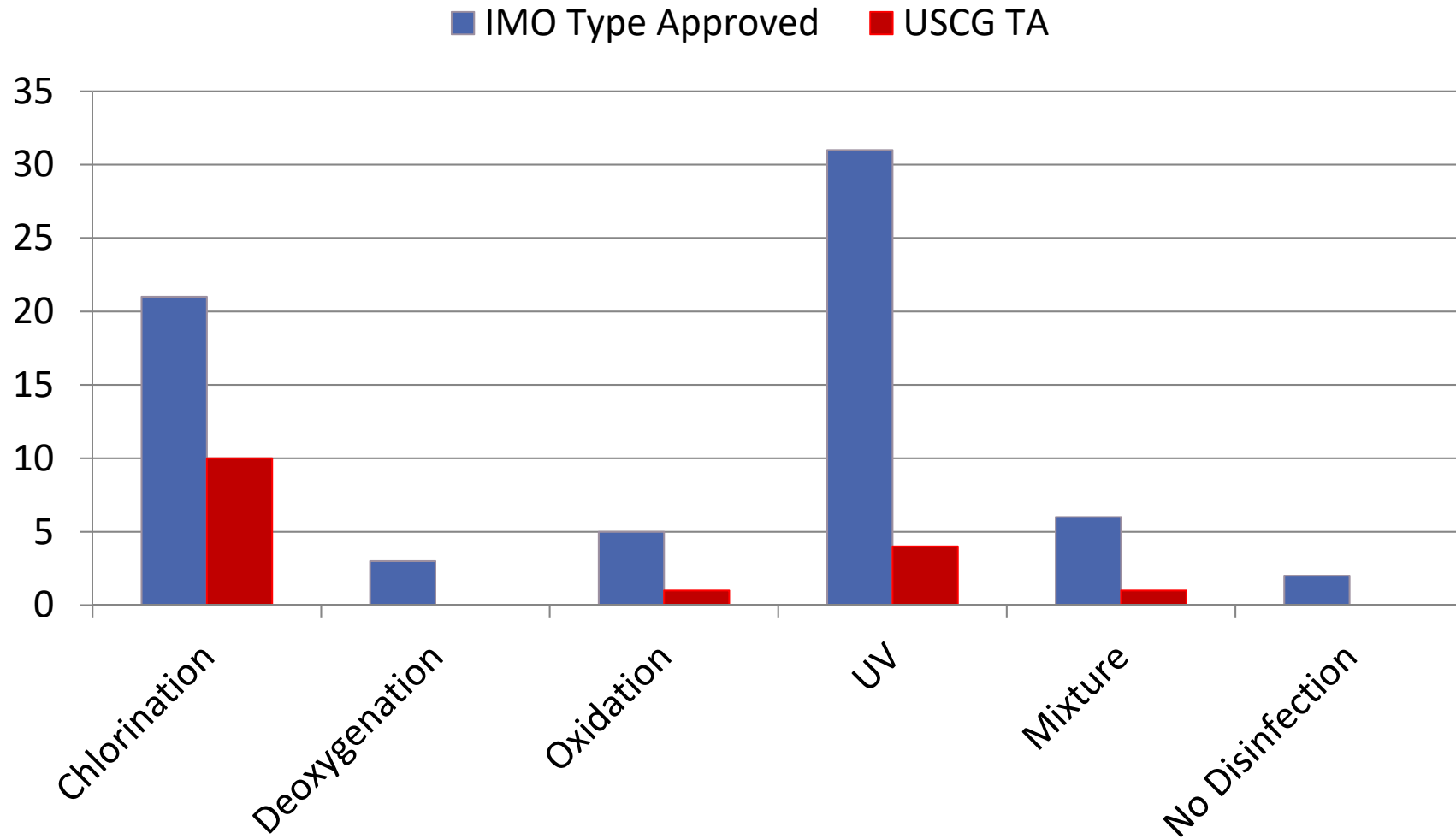
General Information

Category	IMO Type Approved	New BWMS Guidelines Approved	USCG Type Approved
No. of BWMS	68	7	16
BWMS requiring treatment during intake and de-ballasting	61	6	14
In Tank BWMS	2	1	1
BWMS using active substances	30	4	12
BWMS requiring storage of chemicals	27	5	13
BWMS with waste products	3	1	2
Maximum Capacity	16,200 m ³ /h 200,000 m ³		

Note:

BWMS listed under “New BWMS Guidelines Approved and USCG Type approved are included in the overall IMO Type Approval, and the information excludes BWMS no longer on the market.

Disinfection Technology



USCG Type approved by March 2019

USCG Type Approved BWMS – 31 March 2019 (in order of approval)

Optimarin Ballast System (Optimarin – Norway)

PureBallast 3 (Alfa Laval – Sweden)

OceanSaver MKII (TeamTec – Norway)

BalClor BWMS (SunRui – China)

Ecochlor BWTS (Ecochlor – USA)

ERMA FIRST FIT (ERMA FIRST – Greece)

Electro-Cleen™ System (Techcross, Inc. - Republic of Korea)

Purimar BWMS (Samsung – Republic of Korea)

BIO-SEA B BWMS (BIO-UV – France)

Aquarius®-EC BWMS (Wärtsilä Water Systems, Ltd. – England)

HiBallast BWMS (Hyundai Heavy Industries Co., Ltd – Republic of Korea)

OceanGuard BWMS (Headway Technology Co., Ltd. – China)

BallastAce (JFE Engineering Corp. – Japan)

GloEn-Patrol BWMS (Panasia Co., Ltd – Republic of Korea)

BALPURE BWMS (De Nora – USA)

inTank™ (Envirocleanse – USA)

Key to Details

- The following slides contain details on BWMS from treatment rated capacities to holding times to service networks. Some other important details include:
 - US Flag - While not necessary for other Flags, approval may be indicative of a higher level of component quality.
 - Filtration - Indicates filtration is required
 - Treatment or Neutralization Upon Discharge - Indicates if installation and operation requires a step prior to discharge.
 - Service Network
 - **Limited** - Limited information available and slow response times
 - **Developing** - Newer company in this area with growing network
 - **Centralized** - Established companies that have created specific locations to service vessels and increase locations with sales
 - **Worldwide** - Established marine equipment company

UV Based BWTS details

BWMS	Treatment Rated Capacity (m ³ /h)	US Flag	Filtration	Treatment prior to Discharge	Service Network
BIO-SEA B BWMS	55 – 1.400	No	Yes	Yes	Developing
GloEn-Patrol BWMS	50 – 6,000	Yes	Yes	Yes	Centralized
Optimarin Ballast System	167 – 3,000	Yes	Yes	Yes	Centralized
PureBallast 3	150 – 3,000	Yes	Yes	Yes	Worldwide

UV Based BWTS holding time

BWMS	Hold Time	UV Intensity (UVI)		
BIO-SEA B BWMS	FW: None BW: 72 hours MW: 24 hours	> 690 W/m ²		
GloEn-Patrol BWMS	> 48 hours	> 900 W/m ² at 100% TRC > 600 W/m ² at 50% TRC		
Optimarin Ballast System	> 3 days > 24 hours at 50% TRC	> 600 W/m ²		
PureBallast 3	> 72 hours	UV Reactor Size	Minimum UVI at 50% TRC	Minimum UVI at 100% TRC
		170 m ³ /h		
		300 m ³ /h	530 W/m ²	820 W/m ²
		600 m ³ /h		
		1000 m ³ /h	772 W/m ²	1383 W/m ²
Notes:				
FW – Freshwater (0 – 1 PSU); BW – Brackish Water (10 – 20 PSU); MW – Marine Water (28 – 36 PSU)				

Side Stream EC based BWTS details

BWMS	Treatment Rated Capacity (m ³ /h)	US Flag	Filtration	Neutralization (Required Prior to Discharge)	Service Network
Aquarius[®]-EC BWMS	250 – 4,000	No	Yes	Yes	Worldwide
BalClor BWMS	50 – 80,000	No	Yes	Yes	Limited
BALPURE BWMS	400 – 7,500	Yes	Yes	Yes	Limited
HiBallast BWMS	75 – 10,000	Yes	Yes	Yes	Limited
OceanSaver MKII	200 – 7,200	No	Yes	Yes	Worldwide
Purimar BWMS	250 – 10,000	No	Yes	Yes	Limited

Side Stream EC based BWMS holding time

BWMS	Salinity – Electrolytic Feed Salinity	Hold Time	Treatment Concentration
Aquarius®-EC BWMS	> 15 °C > 15 PSU	24 hours	10 mg/l TRO
BALPURE® BWMS	15 – 50 °C 18 – 36 PSU	> 24 hours	7 – 15 mg/l TRO
BalClor BWMS	> 5 °C > 15 PSU	None	> 7.5 mg/l TRO
HiBallast BWMS	> 4 °C > 15 PSU	FW: > 48 hours BW: > 72 hours MW: > 72 hours	8 mg/l TRO
OceanSaver MKII	> 17 °C > 20 PSU	None	> 1.7 mg/l TRO
Purimar BWMS	4 - 40 °C > 10 PSU	FW: 24 hours BW: None MW: None	2.5 – 3 mg/l TRO

Other EC based BWTS details

BWMS	Treatment Rated Capacity (m ³ /h)	US Flag	Filtration	Neutralization (Required Prior to Discharge)	Service Network
Full-Stream EC-Based BWMS					
Electro-Clean™ System	150 – 12,000	Yes	No	Yes	Limited
ERMA FIRST FIT	100 – 3,740	Yes	Yes	Yes	Centralized
OceanGuard BWMS	65 – 5,200	No	Yes	Yes	Developing
In Tank EC-Based BWMS					
inTank™	Up to 120,000 m ³	Yes	No	Yes	Developing

Other EC based BWTS holding time

BWMS	Salinity – Electrolytic Feed Salinity	Hold Time	Treatment Concentration
Full-Stream EC-Based BWMS			
Electro-Cleen™ System	1.5 PSU	120 hours	> 9 mg/l TRO
ERMA FIRST FIT	> -2 °C > 0.9 PSU	None	> 6 mg/l TRO
OceanGuard BWMS	> 0.85 PSU	FW: > 120 hours BW: > 24 hours MW: > 24 hours	2.0 mg/l
In Tank BWMS			
inTank™ (Envirocleanse – USA)	Conductivity > 22 mS/cm	> 24 hours	2 – 5 mg/l TRO (varies with hold time)

Chemical addition based BWTS details

BWMS	Technology	Treatment Capacity (m ³ /h)	Filter	US Flag	Neutralization (Required Prior to Discharge)	Service Network
BallastAce[®]	Filtration & Chemical Injection (excludes NEO-CHLOR MARINE granules)	500 – 3,500	Yes	No	Yes	Limited
Ecochlor[®] BWTS	Filtration & Chlorine Dioxide Treatment	500 – 16,200	Yes	Yes	No	Centralized

Chemical addition based BWTS holding time

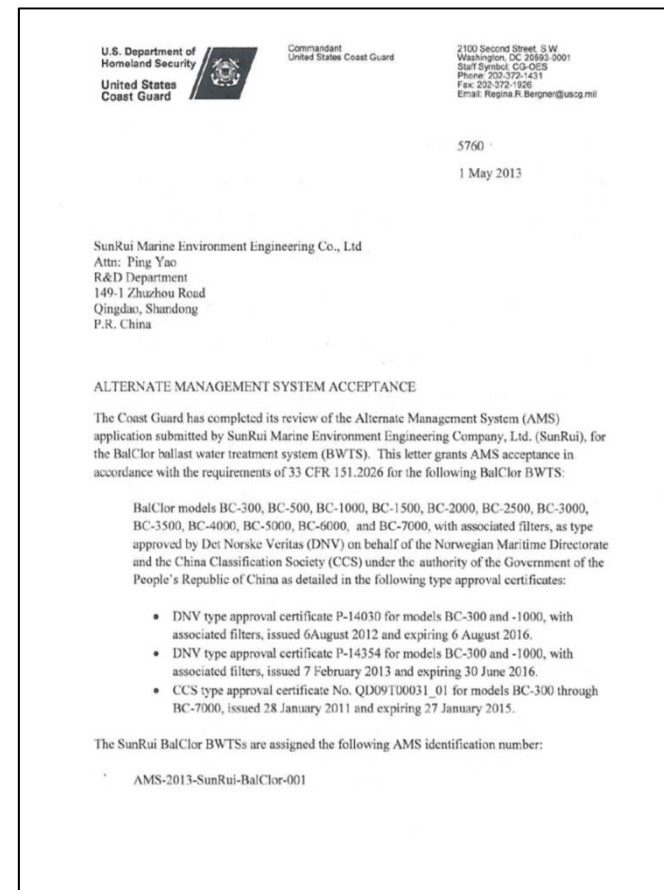
BWMS	Salinity Limitations	Hold Time	Treatment Concentration
BallastAce[®]	None	> 24 hours	10 mg/l TRO
Ecochlor[®] BWTS	None	24 hours minimum (Discharge must meet 0.2 mg/l ClO ₂ MADC)	4.25 mg/l ClO ₂

USCG TA application under review

BWMS	Submission	Treatment Sequence	TRC Range
NK-O3 BlueBallast II BWMS (NK BWM Co., Ltd. – Korea)	30-Aug-18	In-tank Ozonation	200 – 8,000 m ³ /h
NK-O3 BlueBallast II Plus BWMS (NK BWM Co., Ltd. – Korea)	27-Sep-18	In-tank Ozonation	200 – 8,000 m ³ /h
CompactClean BWMS (DESMI Ocean Guard A/S – Denmark)	18-Oct-18	Uptake: Filtration + UV Disinfection Discharge: UV Disinfection	135 – 3,000 m ³ /h
Aquarius® - UV BWMS (Wärtsilä Water Systems, Ltd. – England)	19-Oct-18	Uptake: Filtration + UV Disinfection Discharge: UV Disinfection	50 – 1,000 m ³ /h
Evolution BWMS (Cathelco Ltd. – UK)	19-Oct-18	Uptake: Filtration + UV Disinfection Discharge: UV Disinfection	34 – 1,500 m ³ /h
LUV U1 (Semb-Eco Pte, Ltd. – Singapore)	27-Nov-18	Uptake: Filtration + UV Disinfection Discharge: UV Disinfection	500 m ³ /h
HK-S(E) (Miura Co., Ltd - Japan)	23-Jan-19	Uptake: Filtration + UV Disinfection Discharge: UV Disinfection	200 – 900 m ³ /h

AMS expiration

- The USCG accepted BWMS approved under the BWM Convention as Alternate Management Systems (AMS).
- Vessels are able to use the installed AMS for 5 years after the vessel's compliance date. After that period, the BWMS needed to be updated to a USCG type approved model.
- Approved extension dates are vessel compliance dates.
- Many vessels will be able to operate the AMS version for about 10 years due to time installed and granted extensions.
- For some "new vessels", the 5-year period may be expiring in 2019 and 2020.
- Discussing with the USCG options - such as extensions - for vessels with AMS expiring and the system is still undergoing testing or for which major modifications are needed.



Transition from AMS to USCG TA model

- BWMS manufacturer should contact owner or ship and provide:
 - List of upgrades needed
 - Timeline for upgrades to occur
- BWMS manufacturer should inspect vessel.
- After upgrades are made, BWMS should:
 - Place nameplate with USCG type approved information on BWMS
 - Provide USCG type approved model
- Ship or owner should *not* be making and applying the nameplates



Thank you!

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