



ABS Guide for Ballast Water Treatment

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GREAT LAKES BALLAST WATER COLLABORATIVE MEETING

Regulatory Developments

- International Regulatory Status (IMO)
 - BWM Convention enters into force 12 months after ratification by 30 States with 35% world's GT
 - As of 1 July 2012, 35 Member States representing approx. 27.95% GT has ratified the Convention:
 - Albania, Antigua and Barbuda, Barbados, Brazil, Canada, Cook Islands, Croatia, Egypt, France, Islamic Republic of Iran, Kenya, Kiribati, Republic of Korea, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mexico, Mongolia, Montenegro, the Netherlands, Nigeria, Niue, Norway, Palau, the Russian Federation, Saint Kitts and Nevis, Sierra Leone, South Africa, Spain, Sweden, Syrian Arab Republic, Trinidad and Tobago, and Tuvalu



IMO BWMS Type Approvals (G8)

Type Approved Systems	Methods (TA Certification)
NEI VOS-500 - NEI VOS (300-6800m ³ /hr) (*)	De-oxygenation (Liberia, Malta, Marshall Islands, Netherlands& Panama)
SEDNA BWMS (Withdrawn from Market)	Peraclean (Germany)
PureBallast (250-2500m ³ /hr)	Filtration/UV/oxidation (Norway)
Electro-Cleen System-300A (Techcross Inc) (300m³/hr)	Electrolysis/Electro-chlorination (Korea)
OceanSaver AS (42-10000m ³ /hr)	Filtration/Cavitation/De-oxygenation/ Electro-dialytic (Norway)
Hyde GUARDIAN HG 300 (60-6000m³/hr) (*)	Filtration/UV light (UK)
NK-O3 BlueBallast System (250-8000m³/hr)	Ozone (Korea)
OptiMarin (OBS) (14-5400m ³ /hr) (*)	Filtration/UV light (Norway)
GloEn-Patrol BWMS (50-6000m ³ /hr)	Filtration/UV light (Korea)
ClearBallast (Hitachi BWMS)(200-2400m ³ /hr)	Flocculent injection/Magnetic separation/ Filtration (Japan)
JFE BallastAce (17.5-4500m ³ /hr)	Filtration/Chlorination/Cavitation (Japan)
EcoBallast (HHI) (600 m ³ /hr, 700 m ³ /hr, 1000 m ³ /hr,)	Filtration/UV Radiation/Quartz Sleeve Cleaning(Korea)

IMO BWMS Type Approvals (G8)

Type Approved Systems	Methods (TA Certification)
Unitor Ballast Water Treatment System (Withdrawn from Market)	Filtration/Electro-chlorination/Ozone/ Cavitation (South Africa)
CleanBallast (RWO) (150-3750m ³ /hr)	Filtration/Electro-chemical (producing hydroxyl radicals and free active chlorine) (Germany)
BalClor BWMS (SunRi Marine Environment Engineering Company) (BC-300, BC-1000 incorporating BC-500, BC-1500, BC-2000, BC- 2500, BC-3000, BC-3500, BC-4000, BC-5000, BC-6000 & BC-7000)	Filtration/Electrolysis (generating sodium hypochlorite) (China)
Blue Ocean Shield (*) (BOS02-250, BOS02-600, BOS05-700 incorporating BOS02-(100~300) & BOS05-(100~3500))	Hydro-cyclonic separation/ Filtration/UV disinfection (China)
PureBallast 2.0/ PureBallast 2.0 Ex (250 m ³ /hr - one AOT reactor. Several AOT reactors can be installed in parallel for higher flow rates)	Filtration/UV/Oxidation (Norway)
BSKY BWMS (*) (BSKY250, incorporating types BSKY100 to BSKY6000)	Centrifuge/Ultrasonic wave sterilization/UV light (China)
OPS (Ocean Protection System)-Mahle (*) (250m ³ /hr)	2 stage Filtration & UV irradiation (Germany)
FineBallast OZ (Mitsui Engineering & Shipping Co. Ltd.) (75~300m ³ /hr)	Ozone & Special pipe (Japan)

IMO BWMS Type Approvals (G8)

Type Approved Systems	Methods (TA Certification)
BalPure (Severn Trent De Nora) (BP-500, BP-1000, BP-2000, BP-3000, BP-4000 & BP-5000)	Filtration/Electrolysis (generating sodium hypochlorite) (Germany)
OceanGuard (Qingdao Headway Marine Technology Co., Ltd.) (50-9350m ³ /hr)	Filtration, electro-catalysis, ultrasonic treatment (Norway)
Ecochlor (400-16000 ³ /hr)	Filtration, Chemical Injection (ClO ₂) (Germany)
HiBallast (HHI) Ballast Water Management System (75m ³ /hr, 150m ³ /hr, 225m ³ /hr, 300m ³ /hr, 500m ³ /hr, 600m ³ /hr, 900m ³ /hr, 1000m ³ /hr, 1200m ³ /hr, 1500m ³ /hr, 2000m ³ /hr)	Filtration/Electro-chlorination neutralization (Korea)
Purimar (SHI) (250m ³ /hr – 6,500m ³ /hr)	Filtration/Electrolysis (generating sodium hypochlorite) (Korea)

ABS Ballast Water Treatment Guide

- Prerequisite: BWMS type approved by an IMO Member State
- Two tiers of class notations
 - **Ballast Water Treatment (BWT)**
 - System installed under survey – review of installation design, survey during installation, shipboard function test (e.g. sea trial or quay trial)
 - Systems not installed under survey – evaluation of on board BWMS, shipboard function test
 - **Ballast Water Treatment Plus (BWT+)**
 - BWMS installed: IMO Member State type approval and ABS approval
 - Systems installed under survey
 - BWMS fabricated under survey at the manufacturing facility by ABS
- Owners must comply with the installation requirements of the Guide even if they do not seek the optional notation

ABS Approval of BWMS for BWT+

- Basic requirements
 - Design evaluation of system and components
 - Design review: design review aiming at safety and compliance with ABS Rules, system's efficacy based on IMO type test report, and issuance of design review letter (DRL); or
 - Product design assessment (PDA): generic approval of system and components and issuance of design assessment certificate
 - Survey during manufacture, including witnessing tests and acceptance tests
 - Issuance of reports
- Under ABS Type Approval Program
 - Product design assessment (PDA)
 - Manufacturing assessment (MA)



Ship Plans

Type of Ship Drawings / Plans	For Approval (AP) or Information (I)	Placed Onboard Vessel for Survey (S)
General arrangement drawings of BWMS, including locations and layout	AP	NA
Arrangement and capacity of ballast tanks and pumps	I	NA
Ballast piping system drawings	AP	NA
Location of ballast sampling facilities	AP	NA
Electrical installation drawings and main power cable drawing	AP	NA
Power calculation document	AP	AN
Control, monitoring and safety system documentation	AP	NA
Local instrumentation arrangement plan	AP	NA
Structure plans	AP	NA
Storage tanks and day tanks containing chemicals and preparations used to treat ballast water	AP	NA
Safety documentation for hazardous chemicals, where applicable	I	NA
Leakage detection system and safety features associated with the generation of toxic or flammable gases	AP	S

Ship Manuals & Special Studies

Type of Ship Drawings / Plans	For Approval (AP) or Information (I)	Placed Onboard Vessel for Survey (S)
Safety assessment study for BWMS employing chemical treatment and active substances	AP	NA
Risk/safety assessment study for BWMS equipment locating in a hazardous area on oil or chemical tankers	AP	NA
BWMS operating and safety manuals	AP	S
Ballast Water Management Plan	AP	S
Shipboard function test plan	AP	NA
Ballast Water Record Book	I	S

System Related & Installation Criteria

- Common criteria
 - BWMS locations – hazardous area issues
 - Ventilation systems
 - Structural considerations
 - Electrical system
 - Instrumentation
- System specific considerations
 - Mechanical separation systems
 - Physical treatment systems
 - Chemical treatment and active substance systems
- Special firefighting equipment and arrangements
- Sediment control

Summary & Conclusions

- Ratification is pending
- Implementation timelines not consistent
- Type Approval
- USCG Approval
- Some owners have contracted for new builds to be equipped with a BWTS – while others are incorporating provisions to accommodate a BWTS
- Owners of existing ships are evaluating the various BWTS available
- Uncertainty at IMO
- Application ABS BWT Guide
- Communication is essential



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