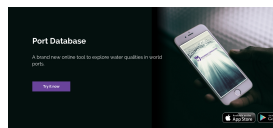
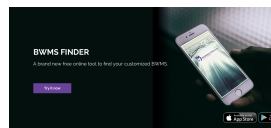


BWMS Tools

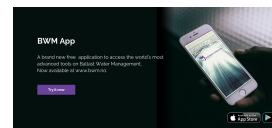
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NEWSLETTER



USCG Ballast Water Series

The USCG published in November and December 2017 a series of 5 articles addressing their approach to the US Ballast Water Regulations. We decided to compile the 5 series into one publication so that our readers can benefit from the information in one place.

Part 1 : Introduction (published 26.11.2017)

In December of 2015, my predecessor, Rear Admiral Paul Thomas, published a six-part blog series to provide an update about the Coast Guard's ballast water regulations. The focus at that time was primarily on

Mouawad
Consulting is
compiling the 5
series published by
the USCG after
permission from
the USCG

implementing the 2012 regulations. The ballast water blog series was one of the most popular series to be published on Maritime Commons, prompting outstanding feedback to the Coast Guard and numerous discussions nationally and internationally.

In 2016, the Coast Guard received more than 122,000 ballast water reports, and reporting compliance is over 90 percent. There are now six U.S. type approved Ballast Water Management Systems (BWMS), and the Coast Guard expects more applications for type approval in the near future. The Coast Guard focus has shifted from implementing the 2012 regulations to ensuring that vessels comply with requirements. Things have changed internationally as well. The International Maritime Organization (IMO) Ballast Water Management Convention entered into force on Sept. 8, 2017, requiring most ships around the world to comply with the Convention. Although the U.S. is not a party to the Convention, the Coast Guard recognizes this milestone as it represents many years of hard work by nations around the globe to prevent the spread of invasive species in ballast water.

Considering the challenges associated with managing ballast water, I am not surprised to be questioned about ballast water during nearly every discussion I have with the maritime industry. Based on these discussions and my most recent engagements, both domestically and internationally, I am now offering a new five-part series to provide an update on the U.S. ballast water program.

As an introduction, I will provide an overall perspective on ballast water management. The second blog will discuss the Coast Guard's shift in focus from regulatory implementation to regulatory compliance. The third blog will provide an update on the U.S. type approval program. In the fourth blog, I will provide insight on a recommended approach to selecting a BWMS, and the fifth blog will discuss contingency planning for inoperable equipment or unavailable management methods.

COAST GUARD PERSPECTIVE ON BALLAST WATER MANAGEMENT

The Coast Guard's approach to managing invasive species in ballast water is analogous to how we have approached other environmental threats. For example, many years ago, the approach to managing oily bilge water and untreated sewage was not like it is today. When these discharges began being regulated, there was initial confusion, followed by uncertainty, and an overall hesitancy to purchase newly required equipment. As we transitioned from implementation to compliance, owners, operators, and crew members adopted new shipboard management practices, procured new

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Mouawad Consulting has a Global presence supporting our vision to become the most relied on engineering company worldwide, when it comes to issues related to the BWM Convention.

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shipboard equipment, and changed the way they operate. We are taking the same approach with ballast water management.

Combating invasive species in ballast water is a complex challenge. At the core of this issue is a real threat to our environment and economy. According to the National Ballast Information Clearinghouse, so far in 2017, almost half of ballast water discharged into the U.S. has been from overseas sources. That's more than 122 million cubic meters of foreign ballast water. The U.S. Fish and Wildlife Service estimates that invasive species cause more than \$120 billion in damages each year in the United States alone. The treatment technologies used in BWMSs are also complex and evolving. In facing these challenges, we must keep in mind these invasive species can enact significant long lasting damage to both the environment and our economy.

Over the past 30 years the Coast Guard has transitioned from voluntary ballast water exchange, to mandatory exchange, to the new ballast water management options and discharge standard presented in our 2012 regulations. Over the past 5 years, the Coast Guard established the Alternate Management

System (AMS) program, which allows the relatively “short term” use of about 70 foreign type approved BWMSs in U.S. waters. The AMS program was established as a bridging strategy, allowing time for those systems to be type approved by the Coast Guard, upgraded to the U.S. type approved configuration and design, or replaced with a U.S. type approved system. To date, the Coast Guard has type approved six BWMSs, with others at or nearing completion of testing.

The Coast Guard focus has shifted from implementing the 2012 regulations to ensuring that vessels comply with requirements.

Now that there are multiple compliance options available for the industry, the Coast Guard is focused on compliance enforcement. Just as the Coast Guard enforces the Oil Pollution Act of 1990, the Coast Guard enforces compliance with the National Invasive Species Act of 1996.

The Coast Guard will continue to work with stakeholders to ensure our compliance approach is as consistent and practical as possible. I look forward to continued dialogue between the Coast Guard and industry as we work together to reduce the threats of invasive species.

The second blog in this series will provide more detail on the Coast Guard's focus on ballast water management compliance..

Part 2: The Coast Guard's focus on compliance (published 28.11.2017)

The United States enforces ballast water management compliance as a normal part of a domestic vessel inspection or Port State Control examination. Between 2012 and 2017, the Coast Guard issued nearly 700 vessel deficiencies for ballast-related incidents of noncompliance. The penalties for these deficiencies vary based on the circumstances and range from a simple “Letter of Warning” to civil penalties.

The Coast Guard is enforcing compliance. Vessel operators must manage expectations. A number of factors should now be obvious to operators as they work to comply with U.S. ballast water management requirements.

Most vessels are now past their original compliance date as stated in the 2012 regulations. Vessels operating in U.S. waters should follow a ballast water management plan (BWMP) that is specific

to the vessel and that identifies how it will comply with the ballast water regulations. Operators should not expect to receive a last minute compliance extension, and they should not expect to discharge untreated ballast water in U.S. waters. Operators should be aware that potential enforcement measures may include operational controls that restrict the vessel's movement or cargo operations, monetary penalties, and a higher priority consideration for future examinations. There is also the potential for prosecution if there is evidence of criminal intent.

Ballast water exchange and compliance date extensions are being phased out as temporary compliance options. In addition, use of an Alternate Management System (AMS) is a temporary bridging strategy until the system receives Coast Guard type approval, a Coast Guard type approved ballast water management system (BWMS) is installed, or another approved method is available for the vessel, such as taking on water from a U.S. Public Water System or discharging ballast water to a reception facility. Extensions are not a strategy to meet the regulatory requirements and will now only be granted for vessels that can document that compliance is not possible now and a strategy is in place to meet the requirements within a specific timeframe. Extension requests must also document that each of the U.S. type approved systems and other approved methods were evaluated as part of the vessel's compliance strategy.

At this time, [the Coast Guard has type approved six BWMSs](#). These systems meet the range of requirements that most vessel owners and operators described in their extension requests in the past. We have additional type approval applications under review, and more than 20 manufacturers are conducting type approval testing for their BWMS models. Extensions are no longer necessary for most vessels because operators are now able to select and install a Coast Guard type approved BWMS.

In lieu of installing a treatment system, the following management options are still available to comply with U.S. regulations:

1. Retain ballast water on board while in U.S. waters (within 12 nautical miles),
2. Discharge to a facility onshore or to another vessel for purpose of treatment, or
3. Use only water from a U.S. Public Water System.

U.S regulations are in effect and are distinct from the requirements of the IMO Ballast Water Management Convention. Although the Convention entered into force on September 8, 2017, the IMO Marine Environment Protection Committee has agreed that the compliance schedule for some vessels will extend through September 2024. As a result, some crews may be tempted to not

An inoperable BWMS will be treated like other pollution prevention equipment that fails or cannot perform its intended function, as designed.

use the vessel's BWMS on a regular basis and only discover problems with it as they enter U.S. waters. I strongly encourage vessels to operate their BWMS regularly to ensure the crew is trained and proficient, and the systems remain operational. This approach is the best way to ensure the BWMS is fully operational when you need it.

An inoperable BWMS will be treated like other pollution prevention equipment that fails or cannot perform its intended function, as designed. Inoperability is a compliance issue. It is not a valid reason to discharge unmanaged ballast to U.S. waters, nor is it grounds for an extension to a vessel's compliance date. I will provide more information on inoperable equipment in the last blog of this series.

In closing, it is important to recognize that all ballast water discharged in U.S. waters must be managed and reported in compliance with federal regulations. Vessel owners and operators should be aware that the Coast Guard will fully enforce all requirements. I look forward to your feedback, continued dialogue, and support as we push forward to combat the very real threat presented by invasive species in ballast water.

Part 3: Coast Guard BWMS type approval program update (published 29.11.2017)

I am pleased to report that since 2015, there has been a dramatic increase in the volume of ballast water being treated before being discharged into U.S. waters. In 2015, about 150,000 cubic meters of treated ballast water was discharged monthly, but by 2017, the monthly discharge of treated water increased more than 10-fold to about 1.8 million cubic meters per month. The Coast Guard has strived to keep pace with this increase with the approval of six ballast water management systems (BWMS) and several additional systems now under review or undergoing testing at one of the Coast Guard-accepted Independent Laboratories (IL). The type approved BWMSs listed below represent a range of technologies and pumping capacities. For additional information on each system, a copy of the type approval certificate can be found under the "Environmental" tab on the [Coast Guard Homeport website](#).

Manufacturer	Treatment Technology	Flow Rate (m ³ /hr)
Alfa Laval	Filtration and ultraviolet light	85-3,000
EcoChlor	Filtration and chemical injection	500-16,200
Erma First	Filtration and electrolysis	90-3,740
TeamTec OceanSaver AS	Filtration and electrodialysis	200-7,200
Optimarin	Filtration and ultraviolet light	167-3,000
Sunrui	Filtration and electrolysis	170-8,500

Current list of type approved Ballast Water Management Systems.

[The Marine Safety Center](#) (MSC) verifies that each type approval submission meets the requirements contained within 46 CFR 162.060. Each application undergoes a six-step review process: (1) initial screening, (2) engineering review, (3) land based test review, (4) shipboard test review, (5) component test review, and (6) scaling review. Some of the more common issues encountered during the review process are discussed below.

Alternative evaluation requests: When a required evaluation, inspection, or test is identified as not applicable or impracticable, a request for an alternative evaluation that is equivalent to the requirements can be made under the provision of 46 CFR 162.060-10(b)(1). There is no provision within the regulations to provide a waiver or exemption to a requirement. Each proposed alternative must first be described and justified; in most cases, a literature review and test data are provided to assist with the justification of equivalence. Alternative requests may be submitted by the IL at any time during evaluation and testing. ILs are encouraged to submit requests for alternatives at the earliest opportunity.

Electrical equipment in hazardous areas: With the exception of certain vessels involved in the Maritime Security Program, equipment installed on U.S. flag vessels must comply with the requirements of 46 CFR Subchapters F and J. Although IECEx certificated equipment may be installed in hazardous locations onboard U.S. vessels, equipment certified under the ATEX directive may not, per 46 CFR Subchapter J. Common Marine Equipment already in use for marine applications that is tested or type approved under IACS UR E10 does not require component testing under 46 CFR 162.060-30.

Water quality: In some cases during testing, water quality conditions deviate from the challenge conditions specified in the “Generic Protocol for the Verification of Ballast Water Treatment Technologies,” commonly referred to as the “ETV Protocol”, which is incorporated by reference in the type approval requirements under 46 CFR 162.060. For land-based testing, the ETV Protocol allows for deviations and, in some cases, the Coast Guard will accept 10% deviation from prescribed challenge water conditions found in the ETV Protocols and 46 CFR 162.060-26(d) and 162.060-28(g). The IL must approve the deviation and provide a detailed explanation in the test report for why the required challenge conditions were not met. Deviations from challenge conditions during shipboard testing are not permitted.

Scaling: Scaling studies evaluate the effectiveness of a BWMS over a range of treatment rated capacities without requiring that every unit in the range be tested. At a minimum, scaling submissions should include the following elements: an experimental design and test plan, a model to represent key parameters for each BWMS unit, validation of the model with experimental data, and IL verification of a scaling study. Scaling studies submitted in support of type approval for BWMS models that have not been fully tested are reviewed by subject matter experts familiar with the system type and the modeling approaches used to scale from the base units.

satisfying the type approval regulations does not guarantee that the system will work without vessel design or operational modifications

The Coast Guard’s type approval process ensures that the system and its components are tested under a range of challenging conditions. However, satisfying the type approval regulations does not guarantee that the system will work without vessel design or operational modifications. An essential part of any shipping company’s strategy for compliance will be working with the manufacturers to determine which type of BWMS is best suited to a particular vessel and its operational profile.

Part 4: The “plug and play” ballast water management system (published 30.11.2017)

In various contexts and in the course of many conversations, shipowners have expressed the expectation that ballast water management systems (BWMS) should be “plug and play” equipment. Owners who recently built ships and wrote BWMS specifications into the contracts with the expectation that, upon delivery, there would be sufficient space, power, and piping available for a future “plug and play” type system are now frustrated that the selection and installation of a BWMS requires additional work specific to the ship and its operating profile. Others expect a system that will “plug and play” into their operations and be effective under all conditions wherever they operate around the world. The different treatment technologies employed by the various BWMS manufacturers each have unique features and operational

requirements that must be satisfied in order for the equipment to function properly. Owners should expect that fitting a BWMS to a specific vessel will require a thorough analysis of the vessel's engineering systems, cargo operations, and trade routes.

While consultation with specialists and contractors may help vessel owners and operators meet this new challenge, it may not be appropriate to completely outsource this work and expect a “plug and play” capability. A more realistic expectation is that the selection, installation, operation, and maintenance of a BWMS will require analyses specific to the vessel and its operating profile. Every BWMS installation is a customized installation, and every ballast water management plan (BWMP) is a customized plan.

To comply with the regulations, vessel operators may have to modify the vessel design operations and, to some extent, their technical and logistical support operations. Some ships will require more extensive modifications and support. “Plug and play” may have been a reasonable expectation for other types of pollution control technologies, yet it is not a reasonable expectation for a BWMS. The operation of a BWMS directly impacts cargo operations. Cargo loading and discharge typically do not depend on the operation of an OWS, an exhaust scrubber, or a tank cleaner in the same way they depend on the operation of a BWMS. Because ballast water management is so closely linked to the ability to load or discharge cargo in real time, owners shouldn't expect “plug and play” but instead should require the same level of diligence, analysis, and integration they would give to any other aspect of a cargo management system.

“plug and play”
solution is not likely
to succeed

The complexity and breadth of a BWMS's impact on vessel operations means that a “plug and play” solution is not likely to succeed. The preferred approach may be to “get in the game.” Successful efforts include additional design and engineering, a full review of maintenance requirements, a comprehensive comparison and analysis of BWMSs to shipboard operations, and the development and implementation of a crew training plan for the BWMS.

Part 5: Contingency planning for ballast water management (1.12.2017)

Earlier in this series, I discussed the Coast Guard's intention to enforce compliance with the ballast water discharge standards similar to how we enforce regulations restricting the discharge of oil and sewage. We expect all ballast water discharged to U.S. waters to be managed and reported in compliance with federal regulations. As with other environmental laws and regulations, planning for compliance requires planning for contingencies. For ballast water, contingency planning should be included in the vessel-specific ballast water management plan (BWMP).

The BWMP should provide succinct directions and alternate measures to be taken if a ballast water management system (BWMS) is inoperable or the vessel's intended compliance method is unexpectedly unavailable. In a recent issue of [NAMEPA magazine](#), Rear Adm. Paul Thomas discussed the requirements for and importance of BWMPs. I encourage you to review the information presented there.

The BWMP should provide contingency measures that are specific to the vessel, its operational profile, and its intended ballast water management method. The BWMP should also outline the

procedure for consulting with the Captain of the Port (COTP) and reporting to the National Ballast Information Clearinghouse (NBIC).

If a BWMS stops operating properly during a voyage, or the intended management method is unexpectedly unavailable, regulations in 33CFR151.1515 and 2040 require that the vessel owner or operator inform the nearest COTP as soon as practicable. Although it is not required by the regulations, I recommend that the vessel owner or operator also contact the destination COTP as soon as practicable to identify options for compliance with the ballast water regulations.

If a vessel representative contacts the COTP regarding a vessel in U.S. waters with unmanaged ballast water or an inoperable BWMS, the first question the COTP might ask is, “What does your BWMP direct you to do?” The second question may be, “How do you plan to comply with the regulations?” Additional information the COTP may request includes the length of time the

The BWMP should provide contingency measures that are specific to the vessel, its operational profile, and its intended ballast water management method

system has been inoperable, the suspected cause of failure, repairs already completed, a schedule for proposed corrective action, and other operational data. The COTP will use this information to confirm the BWMS meets the “unexpectedly unavailable” threshold under 33CFR151.2040(b). Specifically, the COTP needs to determine if attempts

to repair the BWMS are supported by communications with the manufacturer and other compliant ballast water management methods are available.

As with other instances of potential noncompliance, if a vessel is discovered to not be in compliance with the regulations, the COTP may impose operational controls that restrict the vessel’s movement or cargo operations, a monetary penalty, and a higher priority consideration for future examinations. Restrictions in cargo operations can be significant and include port, agent or pilot fees, additional fuel costs, and cargo delays. There is also the potential for prosecution if there is evidence of criminal intent.

As I wrap up this five-part series, let me close by stating that compliance is now possible, and expected. The Coast Guard has transitioned from program implementation to compliance and enforcement. Just as we worked to address previous environmental threats in the past, the Coast Guard will continue to work with industry to achieve compliance and protect the environment from threats posed by invasive species. As always, we welcome and look forward to your feedback.