Ballast water testing and compliance: match fit and fit-for-purpose?

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Q&A Summary

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VF | Viktor Friberg, Alfa Laval
GM | Gireesh M Menon, Aries Marine, UAE
For a vessel fitted with BWTS: what is the USCG requirement for BWTS sample water testing. If testing for BWTS discharge water is tested in Feb 2020 and the vessel is again calling US port in Dec 2020 - do we need to do ballast water testing again to meet vgp requirement.

MH | To repeat Biological VGP testing will be dependet on installation date.
VF | The need to repeat VGP testing will be dependent on installation date and if the previous test results were below the permit limits.
GM | The testing requiremnt is based on the installation date of the equipment and compliance of the previous test results with the allowable limits.

How about live monitoring of samples like it's being done for OWS or ODME's on tanker vessels

VF | To our knowledge, there are only very few in-line solutions available for live monitoring of discharge ballast water. These are quite expensive and most are only focusing on phytoplankton, so as long as this is not a requirement, we don't believe these will be installed frequently.

GM | It is very difficult to detect inline particles esp., Phytohaltons similar to an ODME/PPM meter. As of now there are offshore kits and methods which can help in test the water from sampling. We may have this option of inline testing in future.

How does the MEPC Resolution 206(62) allowing alternative ways to comply with the D2 standard (other than BWTS) affect sampling procedures and does this occur within the industry at all?

VF | Our expertise is within ballast water treatment.
GM | The MEPC Resolution 206(62) had suggested for other methods of ballast water management in accordance with regulation B3.7. Very few systems came up with such method and these are yet to be type approved by IMO or USCG. Also the method to be used in ships is still under discussion.

When BWMS is certified D2 - during trouble, is it permitted to do exchange Ballast at mid-sea by convention ?

VF | In general this is not permitted. However, if described in the ballast water management plan, approved by the administration, it can be an option.
GM | The contingency measure for the BWM D2 can be mentioned in the Ballast water Management plan. This can mention 2 or 3 contingency measures which can implemented if the installed BWT System fails/is not in operation. This can be bypassing the system with a additional valve, using another pump for ballasting/deballasting etc.
Is it important that the 3rd party have their own labs for commissioning test?

MH | No, but it is easier to control quality if you have your own labs.
VF | Not necessarily as analysis often will be conducted on board the vessel. But it is important that the lab personal are properly trained and that the selected laboratory follows all the requirements in Guidelines for ballast water sampling (G2) Resolution MEPC.173(58) and Guidance BWM.2/Circ.42/Rev1.

What are the Ballast water Commissioning Testing requirements under French Flag?

MH | These follow general requirement
VF | Regulation E-1 of the BWM Convention will not enter into force before May 2022 (at the earliest) and to our knowledge France has not implemented any commissioning testing yet.

What amendment do you expect in MEPC 79?

MH | See Alfa Laval respond
VF | In MEPC 75, it is expected to amended Regulation E-1 to the Convention including Commissioning Testing and a revised Guidance for Commissioning Testing e.g. excluding bacteria.

Please confirm that once the system is certified to the D2 standard, there is no need to repeat this test at an independent laboratory annually.

MH | Yes, there will be no requirements to test the system on annually basis according to IMO but it is different with VGP, there you will have to do an annually biological test
VF | According to IMO regulations there will be no requirement for annual test of compliance with the D-2 discharge criteria. US EPA requires yearly sampling and analysis of bacteria to be in compliance with the 2013 Vessel General Permit.
Is there a link between BWMS types and/or filtration levels and vessels failing commissioning testing or D2 sampling?

MH | There is not a link with BWMS type and filtration, because BWMS was type approved before commissioning testing, reasons can occur during installation.

VF | In our experience the reasons for failed testing is that the system was not operated properly in accordance with the system’s operation manual and/or that tanks and pipes has not been properly cleaned prior to installation.

GM | The system operation is mainly type approved for the operation and has to be strictly complied with the operational manual of the equipment. Most of the manufacturers are using the same filter manufacturers and similar mesh sizes.

Is it required to test inlet water? If not, do presenters feel the need to do so?

MH | If you require to do a test today, yes you need to test inlet but with these new regulations from 2022, this will be an option.

VF | MEPC 75 approved a revised Guidance for the commissioning testing of ballast water management systems (BWM.2/Circ.70/Rev.1). The revised version do not include mandatory sampling of ambient/uptake water. However, an inlet sample can provide important information such as the relation to the system’s design limitations and also contain important information for understanding a failed commissioning test. For instance chemical, physical or biological parameters might be helpful to have collected if contamination in tanks/pipes is later suspected.

GM | Almost all manufacturers have an requirement of testing the inlet water as this helps in understanding the level of treatment which is done by the system. It can also act as a checkpoint for the quality of treatment and can warn the vessel owners if a maintainence of UV Lamps or Chlorination chambers/electrodes as required.

Are there annual or 5-year compliance renewal surveys and if not, would you expect this to be of added-value for ship owners?

MH | If you do a major repair or change filters, you are recommended to test the system.

VF | Annual, intermediate and renewal surveys of BWMS are expected by the flag or it's ruling organ, ensuring that they work as intended and that BWMP is followed. (Similar to surveys for all other vessel certificates e.g. IOPP)
What requirements does commissioning test have for water quality? Can ballast water be taken back to the port for commissioning testing?

**VF |** There are no requirements on the quality of the uptake water during commissioning sampling, as there are for shipboard testing. Collected water samples can be transported to shore for analysis. However, the analysis should be completed within 6 hours after sampling.

Is there existing IMO Regulations on biofouling?

**VF |** There is, RESOLUTION MEPC.207(62)

2011 GUIDELINES FOR THE CONTROL AND MANAGEMENT OF SHIPS' BIOFOULING

TO MINIMIZE THE TRANSFER OF INVASIVE AQUATIC SPECIES

To avoid repeat mistakes, is there a central database where type-approval testing, installation experience and commission testing can be shared? Should that not be a priority before the industry moves onto biofouling?

**MH |** No but you might ask each flagstate or class society of data they have.

**VF |** No, not that we are aware of.

**GM |** There are no such directories with Classification societies or Flags at the moment.

Most of the BWMS cannot operate in muddy water or blackish water, what is the solution for D2 certificate at port when ballast in or de-ballast operation? It is found that plant can run without any trouble at sea, which had trouble at port.

**VF |** In the case of non-compliant ballast water, communication should be between the ship and the Port State according to IMO Circular BWM.2/Circ.62
How much testing is mandatory in the first year excluding commissioning test.

MH | Two biological VGP tests. (if you require this)

VF | For IMO no biological testing will be required. For vessels operation in US Waters with a USCG approved system installed, biological indicator compliance monitoring sampling of ballast water effluent must be conducted 2 times during the first year the system is installed or used.

GM | Biological test are required only for USCG Approved system which has to be 2 times per year.

Do you see a possibility for microbiological dipslide tests for quick monitoring of compliance testing?

VF | Dipslide test for indicating microbes still require >24h incubation time, which might not be considered as quick.

Which is the volume of water that is required for Commissioning testing for detailed and indicative analysis?

MH | Depends on flow rate

VF | Current guideline does not clearly state that. However the revised guideline is expected to be more specific and require a minimum volume of 1 m3.

@Viktor @Michael. What is your position on potential accumulation of organisms in tanks overtime? How do you think owners can deal with regrowth in tanks?

MH | UV-systems treat water at discharge as well, so re-growth is not that big problem. (Viktor will answer this better than me) As long as systems that are using active substance producing enough so you need to neutralize the water before discharge.

VF | The Convention is clear, to continuously use ballast water management systems for all ballast water operations. Sediments should be removed regularly to minimize possible regrowth, which is also a part of the Ballast Water Management Convention.
Is there a possibility that there will be one or two types of treatment system will prevail. If yes, what type treatment system would it likely be.

**VF** | The origin of the Convention is to eliminate an environmental threat to the world’s ocean, - the spread of invasive species. We see UV an upstream and future proof solution to that threat, by solving the problem at the source without introducing any new products to the ocean.

**GM** | As of now we have at least 4-5 different types of treatment technologies which are available in the market. With time and research we may expect alternate methods will also be available

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Regarding the MEPC resolution 206(62) question, the resolution allows for other method of BWM than a treatment system. Do you expect that there will be a lot of demand for alternative methods by e.g. ships that don't have a BWTS (yet)?

**VF** | Our expertise is within BWTS and we are not familiar with this resolution.

**GM** | The MEPC Resolution 206(62) had suggested for other methods of ballast water management in accordance with regulation B3.7. Very few systems came up with such method and these are yet to be type approved by IMO or USCG. Also the method to be used in Ships is still under discussion.

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Will it be more effective to circulate the ballast water through the UV reactor continuously or at frequent intervals to increase the treatment time beyond just uptake and discharge? Will this be practical or is there a limitation for this?

**VF** | Any ballast water treatment system, UV or EC with type approvals are optimized for onboard conditions. Adding unnecessary energy consumption is unwanted.

**GM** | The design of the system can get a little complicated with such an arrangement and may need more valve controls and automation.

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What is your advise if the VGP test fails on AMS approved system?

**MH** | Talk to the manufacturer, they need to fix the problem

**VF** | BWMS shall be used continously for all BW operations and to be operated in line with the operation manual and the BWMP. If the VGP test exceeds the permit limit(s) on any sampling event, they must be monitored two times per year until they have two additional results below permit limits.
It is great concern - BWMS is USCG certified / Class approved but cannot operate in muddy water even tried to operate at low flow but fails (During ballast in at port). What IMO roles on 1) certification 2) Ballast exchange 3) Follow up action i.e informing Flag state /Port state or maker / Class for dispensation?

VF | Contingency measures should be listed in the ballast water management plan. One possible contingency measure can be to exchange the water using the BWMS in more favourable water conditions. In the case of non-compliant ballast water, communication between the ship and the port State should occur, see IMO Circular BWM.2/Circ.62

GM | The contingency measure for the BWM D2 can be mentioned in the Ballast water Management plan. This can mention 2 or 3 contingency measures which can implemented if the installed BWT System fails/is not in operation. This can be bypassing the system with a additional valve, using another pump for ballasting/deballasting etc.

As you said, if the port is muddy, they have to use the bypass, so if they bypass the water from the filter, what will happen for microorganism greater than 50 micro? nespecially in UV system and elechtrochlorination

VF | The BWTS must be operated according to operation manual. In the event of ballast water being below UV-I level or the system has been by-passed, the operator needs to use the defined contingency measures and exchange the water and flush the tanks sufficiently before new ballast water can be taken on board.

GM | The bypass happens along with the system. This means both the filter and UV Lamps/Chlorination chamber is bypassed. The process of deballasting these tanks is to be mentioned as contingency plan in the ballast water management plan which is approved by the Classification society.

I think commissioning & testing & certification to be done considering all scenarios - muddy water / blackish water / river water / Fresh water.

MH | Commissioning testing only test the installation, not the system. That is already type approved and as long as the system can handle the water where the test is done. If you test the system in the Great Lakes, it would be difficult to test in Salt water.

VF | Commissioning testing is not intended to validate the design of type-approved BWMS that are approved by the Administration. Its intended to validate the installation of the system. If the system is correctly installed, the BWMS shall work satisfactory within the stated limitations for the system.
Please elaborate on tank cleanings after using BWTS

**VF** | The Convention is clear, to continously use ballast water management systems for all ballast water operations. Sediments should be removed regularly to minimize possible regrowth, which is also a part of the Ballast Water Management Convention.

**GM** | This mainly depends on the system being installed - UV systems may not have significant impact on the ballast tanks, but we have few vessel owners inform for chemical and chlorination based systems depending on the inner coating (epoxy). We recommend to discuss with the paint manufacturer on the type of BWMS system installed with respect to the coating of ballast tanks.