

# Commissioning sampling for ballast water treatment systems

**Understanding the purpose and implementation**

A photograph of several jellyfish swimming in deep blue water. The jellyfish are translucent with a yellowish glow from their internal organs. They have long, thin tentacles hanging down. The background is a dark, deep blue, suggesting an underwater environment.

May 2020

# Introduction

Water sampling in connection with commissioning testing – more simply expressed as commissioning sampling – is being introduced for newly installed ballast water treatment systems. The IMO requirement was laid out at MEPC 74 in an amendment to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention).

At present, commissioning sampling is not mandatory for the vast majority of vessels. Nor will it become a global requirement before early 2022. Nonetheless, there is already immense confusion on the market regarding the purpose and procedures for it.

This paper clarifies the new requirement, explaining not only what commissioning sampling is, but also why, how and when it should be done.





# The commissioning sampling regulation

In fact, a demand to perform water sampling as part of ballast water treatment system commissioning first arose with Resolution A.1120(40) under the Harmonized System of Survey and Certification (HSSC). The demand was not part of the BWM Convention, however, which is why it was addressed at the MEPC 74 meeting in May 2019. There it was approved as a draft amendment to Regulation E-1 of the BWM Convention, with adoption expected at the next MEPC meeting.

The amendment requires sampling to take place as part of the operational testing of the ballast water treatment system once the installation is complete and finalized. The sampling is to be performed according to BWM.2/Circ.70, *Guidance for the commissioning testing of ballast water management systems*.

The amendment's entry into force has an uncertain timetable, due to the indefinite postponement of MEPC 75. Originally to begin in March 2020, MEPC 75 may simply be merged with MEPC 76 in October 2020. This would put entry into force no earlier than April 2022, which means compliance sampling would not become globally mandatory before that date.

Although the MEPC encourages flag states to implement the requirement today, only a handful have chosen to do so thus far. (See later section, *Implementation of commissioning sampling*.)

- Draft amendment approved at MEPC 74 but adoption delayed
- Earliest entry into force April 2022
- Voluntary implementation encouraged



# What commissioning sampling is – and is not

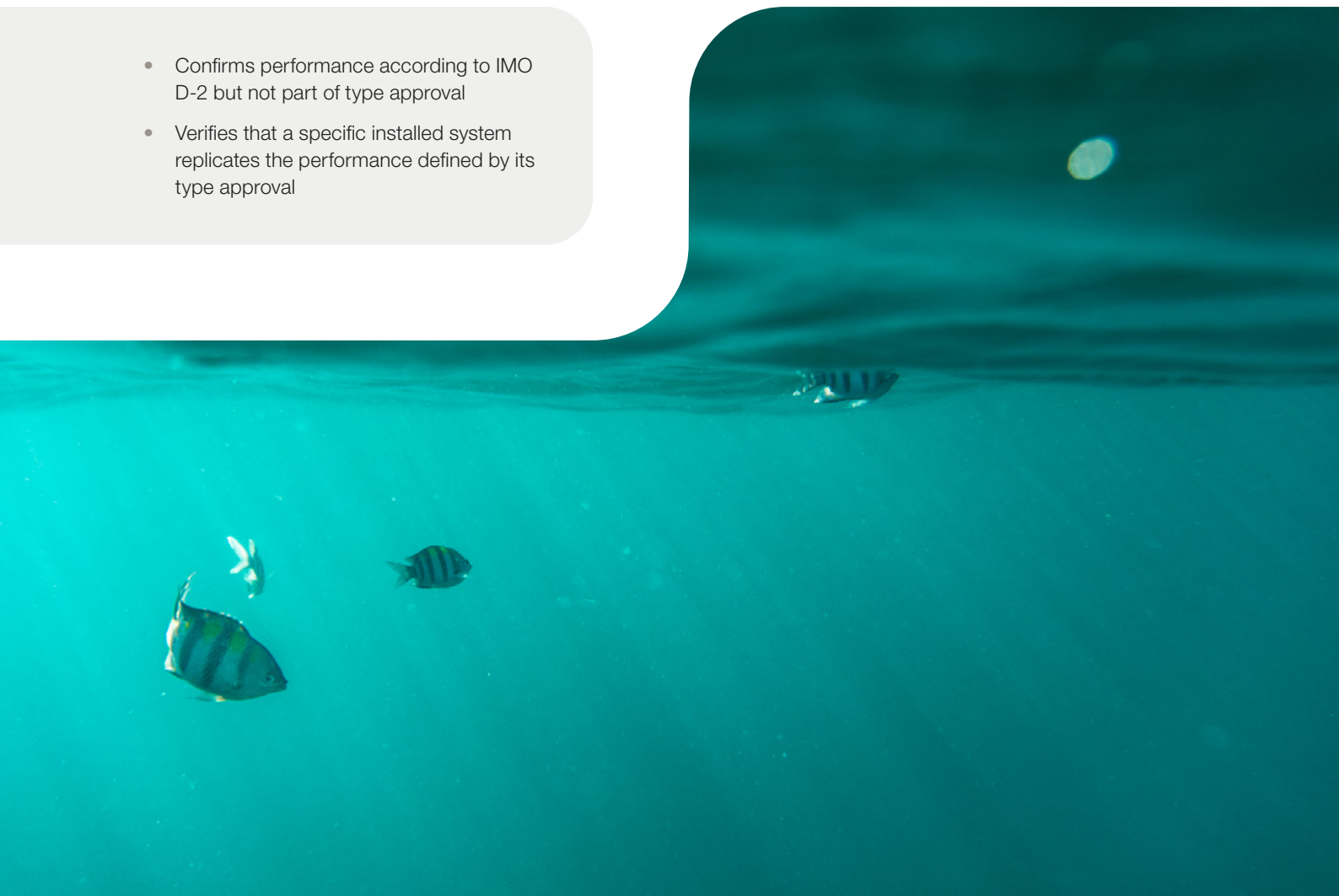
Commissioning sampling is a response to demands from the market. Shipowners have requested proof that their installed ballast water treatment systems will perform according to type approval and meet the IMO D-2 discharge standard. It is important, however, to understand what commissioning sampling actually validates.

Commissioning sampling does not validate the ballast water treatment solution as such. That validation is provided by the type approval, which is an approval of the standard ballast water treatment system design. The design itself has already been shown to meet the IMO D-2 discharge standard – so this is not in question.

Rather, commissioning sampling verifies that the specific installed system replicates the performance defined in the type approval. It is a tool for spotting deviation from the type-approved performance, perhaps caused by a manufacturing defect or an installation error. The sampling is part of the wider commissioning testing that ensures all mechanical, physical, chemical and biological processes are working properly within the system.

The sampling and the testing as a whole are overseen by the flag state or by a classification society authorized by the flag state, to whom any discrepancies must be reported.

- Confirms performance according to IMO D-2 but not part of type approval
- Verifies that a specific installed system replicates the performance defined by its type approval







# The commissioning sampling procedure

Commissioning sampling is a straightforward procedure that is defined step-by-step in BWM.2/Circ.70, *Guidance for the commissioning testing of ballast water management systems*. The steps can be summarized as follows.

- **Sampling of ambient waters**  
A sample characterizing the ambient water should be collected during ballast water uptake. This can be done by any means practical, e.g. using an inline sample port or taking a sample directly from the harbour. The ambient water should be accepted for testing, regardless of the level of challenge it poses to the ballast water treatment system. (NB! See also the next section of this white paper, *Considering System Design Limitations*.)
- **Sampling of ballast water discharge**  
A sample of the corresponding ballast water discharge should be collected after full treatment has been applied, in accordance with the *Guidelines on ballast water sampling* (G2). The sample should be representative of the whole discharge of ballast water from any single tank or combination of tanks being discharged. It should be collected as close as possible to the overboard discharge point and during ballast water discharge whenever feasible.
- **Evaluation of compliance with IMO D-2**  
The respective samples should be analysed to confirm ballast water treatment performance that indicates compliance with the IMO D-2 discharge standard. Using reliable and accurate indicative\* analysis methods, all size classes included in the standard need to be evaluated:
  - Organisms  $\geq 50 \mu\text{m}$
  - Organisms  $\geq 10 \mu\text{m}$  and  $< 50 \mu\text{m}$
  - *Vibrio cholerae*, *Escherichia coli* and *Enterococci*\* Note that none of the indicative methods defined in Table 3 of BWM.2/Circ.42/Rev.1 have been fully evaluated thus far. Because the specified indicative methods are not yet validated, test organizations may instead recommend detailed methods they know to be reliable and accurate.
- **Reporting**  
The sampling methods and analysis results should be documented for the flag state administration or the classification society authorized by the flag state as part of the written report on the wider commissioning testing.

# Considering System Design Limitations

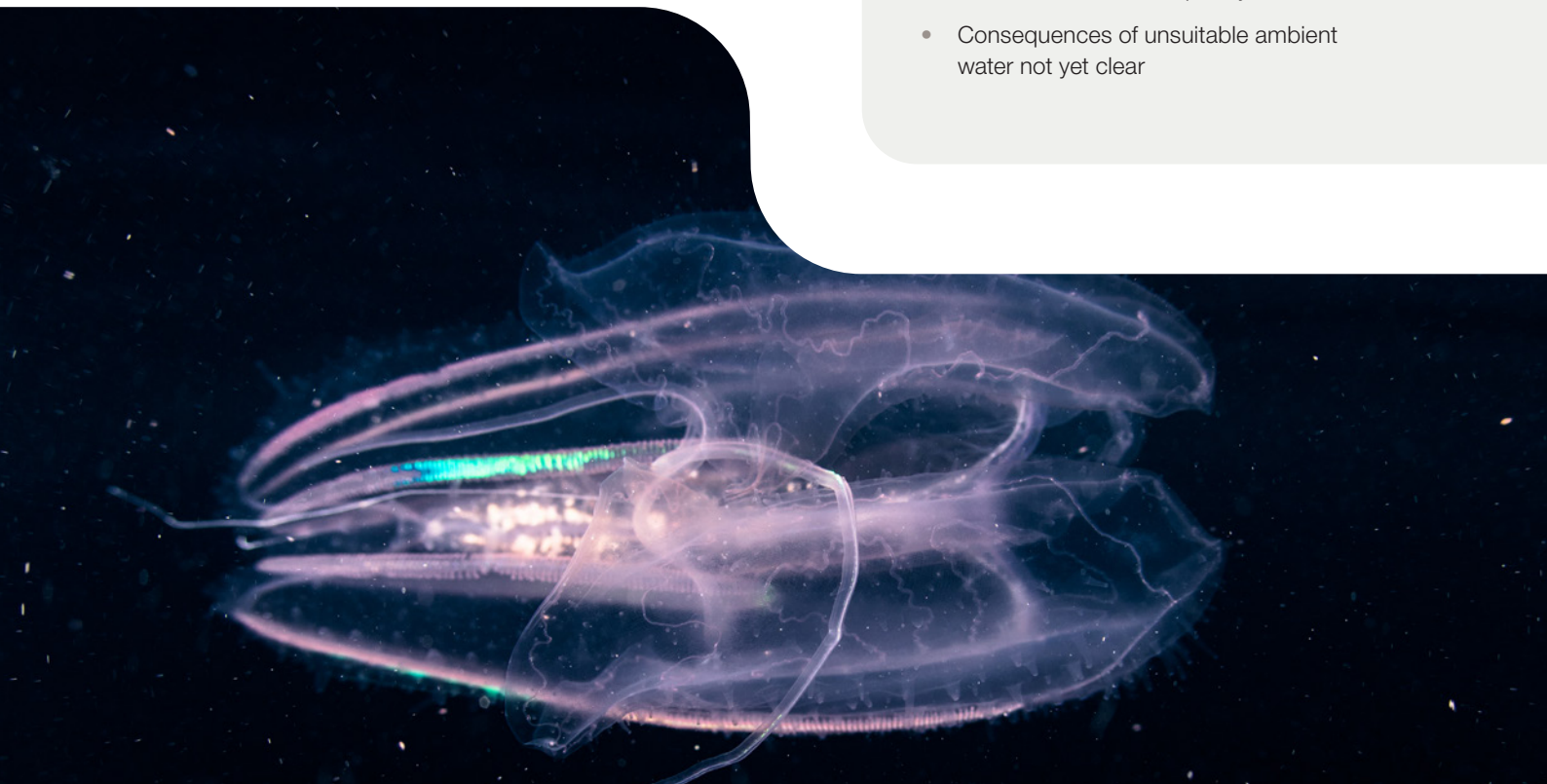
As part of the wider commissioning testing, BWM.2/Circ.70 also requires an assessment of the ballast water treatment system's applicable self-monitoring parameters, e.g. flow rate, pressure, TRO and UV intensity. Not only should the correct operation of all sensors and related equipment be confirmed, the so-called System Design Limitations (SDL) of the ballast water treatment system should be considered. Possible limitations include minimum holding time, salinity requirements and UV transmittance or intensity values.

What remains ambiguous, at least as the guidance is written, is how the System Design Limitations should be related to the challenge level of the ambient water. The guidance states that the ambient water should be accepted for testing regardless of the challenge it poses to the ballast water treatment system. Presumably, this should refer to the biological challenge, i.e. the biological load in terms of organism densities or types. However, the lack of a definition leaves room for other interpretations, such as the properties of the water itself.

Until this is clarified, low salinity or low UV transmittance could also be seen as making the ambient water inappropriate for operational testing. It would then be up to the flag state to decide the course of action. According to the guidance, if the ambient water is not appropriate for operational testing because it falls outside the SDL of the ballast water treatment system, the testing should be evaluated to the satisfaction of the flag state administration.

It is likely, regardless how the challenge level is defined, that unsuitable ambient water would lead to testing in more appropriate conditions after the vessel has left the yard. In this case, a short-term International BWM Certificate with a Condition of Authority would be issued, requiring testing within 2–3 months. However, it remains to be seen how most flag states will deal with the issue in practice.

- Relationship between SDL and challenge level of ambient water poorly defined
- Consequences of unsuitable ambient water not yet clear





# Implementation of commissioning sampling

As stated earlier, the draft amendment to Regulation E-1 of the BWM Convention will not enter into force before early 2022. Until that time, there is no global requirement to perform commissioning sampling. However, the MEPC encourages flag state administrations to begin implementing the procedure as soon as possible, which has led to confusion in the market.

As of March 2020, only a handful of flag states – e.g. Australia, The Bahamas, Cyprus, Panama and Singapore – have chosen to implement the amendment proactively. Australia and Singapore have issued circulars requiring commissioning sampling for ballast water treatment systems installed after 8 September 2019 on vessels

with their respective flags. The other countries have issued circulars as well, although these contain fewer details of what they require.

It is expected that other flag states will follow. However, it is only vessels flagged in these countries that must perform commissioning sampling at present. For vessels carrying any other flag, commissioning sampling is not necessary at this time.

- Not globally required until entry into force (earliest April 2022)
- Currently required by a few flag states implementing early – only vessels with these flags affected



# Responsibilities associated with commissioning sampling

If commissioning sampling is required by a vessel's flag state, it is the shipowner who is responsible for contacting and making arrangements with an appropriate testing body. As the sampling is not a direct part of the commissioning work, managing it does not fall within the standard commissioning scope of the system supplier.

Likewise, the supplier's commissioning scope does not include the fault-finding, corrective actions and new sampling required if the first samples fail to show compliance with the IMO D-2 discharge standard. There may be many possible reasons for a negative result, including failure to clean the ballast water tanks and piping appropriately prior to installation.

Nonetheless, there is nothing in the IMO guidance that prevents the supplier from being involved in commissioning sampling. Flag states and classification societies may require that the actual lab analysis be performed by a facility independent from the supplier. Apart from this, the supplier may offer assistance by arranging for third-party sampling and/or lab analysis outside the standard commissioning scope.

- Sampling not included in standard supplier commissioning scope
- Shipowner responsible for arranging sampling, but supplier may assist to some degree

## For shipowners installing Alfa Laval PureBallast 3

Alfa Laval stays up to date with marine legislation and related developments, including the implementation of commissioning sampling. When installing Alfa Laval PureBallast 3 on vessels flagged in applicable states, shipowners should contact their Alfa Laval representative to discuss commissioning sampling before they contact a testing body.







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Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day. It's all about *Advancing better™*.

### **How to contact Alfa Laval**

Contact details for all countries are continually updated on our web site. Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information.

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