Współczesna Gospodarka

IN MARI VIA CUA

Contemporary Economy
Electronic Scientific Journal
www.wspolczesnagospodarka.pl

Vol. 7 Issue 4 (2016) 59-68
ISSN 2082-677X

THE PRECAUTIONARY PROCEDURES IN THE CASE OF NON-COMPLIANCE WITH THE BALLAST WATER MANAGEMENT CONVENTION'S STANDARDS – POSSIBLE SOLUTIONS FOR POLISH PORTS

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Abstract

On September 8, 2017 the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* (BWMC) adopted in 2004 will enter into force. It imposes a lot of requirements on shipowners and port states. The aim of this article is to elaborate on the possible solutions that may be adopted in Polish ports as precautionary measures in the case of non-compliance with the provisions of BWMC.

The article starts with a brief overview of BWMC and ballast water quality standards. Further, it discusses the possible implications of not meeting the ballast water quality standards under BWMC. The elaboration of potential solutions and mitigation measures in the event of non-compliance with the BWMC constitutes the main part of the article. These are crucial to developing a port contingency plan and include, for example, shore-based reception facility for ballast water, mobile ballast water treatment systems, and using potable water. The article ends with a brief analysis of a possible fee systems for reception of ballast water.

The research was based on a comprehensive analysis of the Convention and related legal documents, interviews with ports' representatives as well as e-mail interviews with maritime authorities in the Baltic Sea countries.

Keywords: ballast water management convention, precautionary measures, contingency planning

Introduction

The amount of water transferred in ships' ballast tanks between different continents and oceans can be significant and is estimated to reach from 3 to 5 billion tonnes annually[1]. It has been known for decades that ballast water can serve as "means of transport" for different organisms into new ecosystems, where, under favourable conditions, they can become invasive. Invasive aquatic species and pathogens discharged through ballast water have been considered as one of the most serious problems posed nowadays to the marine environment. There are numerous examples proving that it has led to serious ecological problems, economic losses[2] and may be dangerous to human health[3].

In order to tackle these problems as well as to prevent and control the spreading of invasive species, the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* (BWMC) was adopted on February 13, 2004. The BWMC will enter into force on September 8, 2017 after ratification by 52 countries representing 35.144%[4] of the combined tonnage of contracting states[5]. This is a very complex legal instrument supported by numerous Regulations and Guidelines that cover all facets of BWM (technical, biological, organizational and legal, among others).

The Convention will apply to all ships engaged in international voyages; however, it also provides certain exceptions to, for example, ships with permanent tanks or not designed to carry ballast water as well as war ships.

1. The discharged ballast water's quality standards under the BWMC

The BWM Convention puts forward two options, which will be introduced sequentially, for ballast water management for ships that do not discharge ballast water to the port reception facilities.

The first possibility is a standard D-1 (Regulation D-1 of the BWM Convention) that covers the ballast water exchange in deep seas. Ships performing ballast water exchange shall do so with an efficiency of 95 % volumetric exchange of this water. For ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet this standard. Pumping through less than three times the volume may be accepted provided that the ship can demonstrate that the efficiency requirements were met.

The important additional requirement is that the ballast water exchange is only possible in areas at least 50 nautical miles from the nearest shore and in waters 200 metres or more deep. The D-1 standard is only allowed during a transitional period i.e. from the BWMC entry into force until the first IOPP[6] renewal survey.

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[1] E. Tsolaki, E. Diamadopoulos, *Technologies for ballast water treatment: a review*, "Journal of Chemical Technology and Biotechnology", January 2010, p.19.

[2] For example, it is estimated that the economic losses caused by the transfer of the comb jelly (*Mnemiopsis leidyi*) from the North American waters into the Black Sea in the early 1980s had amounted to at least USD 240 million by 1992 (see: GEF-UNDP-IMO GloBallast Partnerships Programme and IUCN, *Economic Assessments for Ballast Water Management: A Guideline*. GEF-UNDP-IMO GloBallast Partnerships, London, UK and IUCN, Gland, Switzerland. GloBallast Monographs No. 19, 2010).

[3] GEF-UNDP-IMO GloBallast Partnerships Programme and WMU, *Identifying and Managing Risks from Organisms Carried in Ships' Ballast Water*, GEF-UNDP-IMO GloBallast Partnerships, London, UK and WMU, Malmö, Sweden., GloBallast Monograph No. 21, 2013.

[4] www.imo.org (10.09.2016).

[5] Poland has not ratified the BWMC yet, however there are plans to do so until the end of 2016 or in the early 2017.

[6] International Oil Pollution Prevention Certificate

After the first IOPP renewal survey following the date of entry into force (September 8, 2017) the ballast water discharges will have to comply with the standard D-2 (Regulation D-2 of the BWM Convention). This standard pertains ballast water treatment and sets minimum required level of performance – discharged ballast water will have to contain viable organisms only in numbers below specified limits.[7] Compliance with the D-2 standard can be achieved by installing a ballast water management system (BWMS) approved by the IMO. It implies that vessels, which have not yet installed a ballast water treatment system, will be obliged to do so in the period 2017–2021.

All ships for which the BWMC is applicable and which were constructed after the entry into force date will be required to have a BWMS on board at the time of delivery. There is a variety of BWM systems available, which use different technologies of ballast water treatment. The most popular are electrolysis, ultraviolet, ozonation, chemical injection, cavitation and deoxygenation[8].

The requirements of the standards D-1 and D-2 will not apply to ships that discharge ballast water to a specially designed reception facilities (Regulation B-3.6). Moreover, shipowners are also entitled to apply for an exemption from the provisions of BWMC (under Regulation A-4) which may be granted by the State in clearly specified circumstances and after risk assessment[9].

The BWMC also requires that shipowners should ensure that the following documents are available on board the ship:

- a ship-specific *Ballast Water Management Plan*, approved by the administration,
- an *International Ballast Water Management Certificate*, issued by the flag state (apply to vessels above 400 GT, excluding floating platforms, FPSO and FSO ships), and
- a *Ballast Water Record Book*.

2. Non-compliance with the BWMC

After the BWMC enters into force, the contracting states will be entitled to control whether the requirements of BWMC are met and to take some steps in the case of violation of these requirements.

Ships for which the BWMC is applicable, when calling the port or an offshore terminal, may be inspected by authorized officers of the Port State Control (PSC). The Article 9 of the BWMC provides the scope of such an inspection, which aims to determine whether the ship complies with all BWMC requirements. First of all, inspectors are allowed to verify the validity of the *International Ballast Water Management Certificate*, check notes in the *Ballast Water Record Book* (all failures and malfunctions of the BWM system should be recorded in this book) and take samples of ship's ballast water. A more detailed inspection may be carried out in the case when, for example, there is no valid BWM Certificate on board, the equipment does not correspond with the information given in the Certificate or the crew is not familiar with the procedures of BWM. In such a situation the PSC officer "shall take such steps as will ensure

[7] Ships conducting ballast water management shall discharge less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension and less than 10 viable organisms per milliliter less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and discharge of the indicator microbes shall not exceed the specified concentrations.

[8] B. Werschkun *et. al*., *Emerging risks from ballast water treatment: The run-up to the International Ballast Water Management Convention,* "Chemosphere" 112, 2014.

[9] For further information on this topic see also: M. Klopott, *Koncepcja wydawania zwolnień na podstawie prawidła A-4 konwencji BWMC - istota i krytyka rozwiązania,* „Studia i Materiały Instytutu Transportu i Handlu Morskiego", 2015, nr 12.

that the ship shall not discharge Ballast Water until it can do so without presenting a threat of harm to the environment, human health, property or resources".
In other words, the ship will not be allowed to discharge the ballast water. There are also situations other than those mentioned above that may require a special attention and when deballasting should be prevented. For example:

- a ship is exempted from the provisions of the BWMC under the Regulation A-4 (*Exemptions*) but temporarily deviates from the exemption route (in order to do repairs, for dry-docking, to do a survey etc.),
- a ship is equipped with the BWMS of 1st generation, which does not comply with the standard D-2 for reasons beyond the shipowner's control[10],
- a ship operates exclusively in domestic voyages within the territory waters of one state or on the high seas, but incidentally leaves these waters and proceeds to the shipyard for maintenance or repair[11].

When taking into account all these situation, the question arises: what procedures should be followed in these circumstances?

Whenever there are serious grounds for presuming that the quality of ballast water discharged will not meet the BWMC standards, according to the Article 10 of the BWMC, the PCS inspector:

- may warn, detained or exclude the ship, or
- may give the ship a permission to leave the port for the purpose of discharging the ballast water to a place equipped with appropriate reception facilities for ballast water.

Notwithstanding the above, the violation of BWMC provisions may also be the subject of sanctions established under the law of a contracting state. The sanctions should be adequate in severity to discourage violation of the Convention (Article 8 of the BWMC). As far as detention of the ship is concerned, it should be noted that this is a measure of last resort and any decision of that kind should be made in the extraordinary circumstances and be reasonable, as unduly detention or delay of the ship caused by inspection, entitles the shipowner to compensation for any loss or damage that arises from such a detention or delay.

Guidelines for Port State Control under the BWM Convention (p. 2.5.7) stipulate other measures that PSC inspector can take, such as:

- to impose a ban for the discharge of ship's ballast water (it means that the ship will not be allowed to commence the loading),
- to order the shipowner to undertake all necessary repairs in the case of failure or malfunction of BWMS,
- to order the ship to proceed to an area designated to ballast water exchange during a transition period,
- to allow the discharge of ballast water to another ship or reception facility (shipboard or land-based).

It means that in parallel with PSC's administrative procedures, a variety precautionary measures may be undertaken in order to enable deballasting of the ship and loading commencement.

[10] So far, no definite decision how to deal with this situation has been made by the IMO.
[11] Guidance on Entry or Re-entry of Ships into Exclusive Operation Within Waters Under the Jurisdiction of a Single Party BWM.2/Circ.52

3. The contingency planning in the Polish ports in the case of non-compliance with the BWMC

Currently, there is no possibility of reception of ship's ballast water in Polish ports. Moreover, such port reception facilities for ballast water exist in none of the Baltic ports, and most likely in none of the European or other ports in the world, since there was no need for it. Will this change after the BWMC's enters into force? It should be emphasized that no obligation arises from the BWMC to the state or to the port to provide such reception facilities[12]. This issue was also a subject of discussion among the Baltic ports and maritime authorities of the Baltic Sea countries some years ago and the conclusion was that the decision in that regard should be left to the individual states. So far, the Baltic ports or countries in the Baltic Sea region are not willing to provide the service of reception of ballast water from ships. It is emphasized that it is the shipowner's obligation to ensure that all measures will be taken to satisfy the involved entities (states, ports, maritime authorities). It seems, however, that it should be in the interest of the port and/or the port state to possess some kind of a contingency plan and provide information about the available suitable precautionary measures to enable shipowners to deal with difficult situations, especially when the non-compliance results from a reasons beyond the control of shipowner (failure or malfunction of BWMS) or is a single and temporary event (e.g. deviation).

According to the HELCOM/OSPAR Guidelines (7.17) the following options can be considered as a suitable, precautionary measures[13]:

- Use of land-based ballast water reception facility,
- Use of temporary or mobile BWMS,
- Use of permanent or temporary BWMS installed aboard another vessel,
- D-1 exchange in designated exchange area,
- Use of potable or technical water as a ballast water.

The IMO does not provide any documents related to handling of the ballast water in emergency situation or in the case of non-compliance. The *Guidelines for Ballast Water Reception Facilities (G5)* stipulate only very general requirements for these facilities.

As mentioned above, land-based reception facilities for ballast water can be also considered as an alternative for on-board BWMS as it is stipulated in Regulation 3.6. of the Convention. According to some opinions, shore-based facilities would be more efficient and provide both economic and environmental advantages[14], but it depends on the particular case. For example, feasibility studies carried out in some Baltic ports with regard to building dedicated facilities for the reception of ballast water from ferries did not prove their efficiency and installing BWMS on a ship board appeared to be more efficient. The same applies to shore-based ballast water reception facilities used exclusively as a precautionary measures. Handling of ballast water ashore may require large and therefore expensive storage, as one dis-

[12] In the Article 5 of BWMC, there is only provision concerning the sediments in the ballast water tanks: "each Party undertakes to ensure that, in ports and terminals designated by that Party where cleaning or repair of ballast tanks occurs, adequate facilities are provided for the reception of Sediments, taking into account the Guidelines developed by the Organization. Such port reception facilities shall operate without causing undue delay to ships and shall provide for the safe disposal of such sediments that does not impair or damage their environment, human health, property or resourses of those or other States."

[13] Joint Harmonised Procedure for the Contracting Parties of OSPAR and HELCOM on the Granting of Exemptions from the International Convention for the Control and Management of Ships' Ballast Water and Sediments under Regulation A-4, Adopted as OSPAR Agreement 2013-09 and by HELCOM Ministerial Meeting Copenhagen 3 October 2013; Amended by HELCOM 2015 (March) and OSPAR Agreement 2015.

[14] P. Donner, *Ballast water Treatment Ashore Brings More Benefits* in: N. Belfontaine *et. al*. (edts.), *Emerging Ballast Water Management Systems*, Proceedings of the IMO-WMU Research and Developmnet Forum, Sweden, 2010.

charge of ballast water could go up to tens of thousands of cubic meters. Moreover, it also should be kept in mind that the ballast water received from ship needs a subsequent treatment by a suitable BWTS on-shore and the techniques used for ballast water treatment should correspond with those used on the ships' board. Therefore this solution does not seem to be economically justified and this is not only the case of Polish ports.

As far as other solutions are concerned, the special attention has been recently directed to the mobile facilities, especially to barges or mobile BWTS'es. There are quite a lot companies that offer these kind of solutions, even though there are still a lot of uncertainties and technical problems that have to be tackled (e.g. pumping capacity, ballast water piping inlet and outlet arrangements). The mobile container which can be put on board of the vessel or on a trailer is gaining increasing popularity (Fig.1. and Fig. 2) It can be used as a regular BWMS or as a precautionary measure.

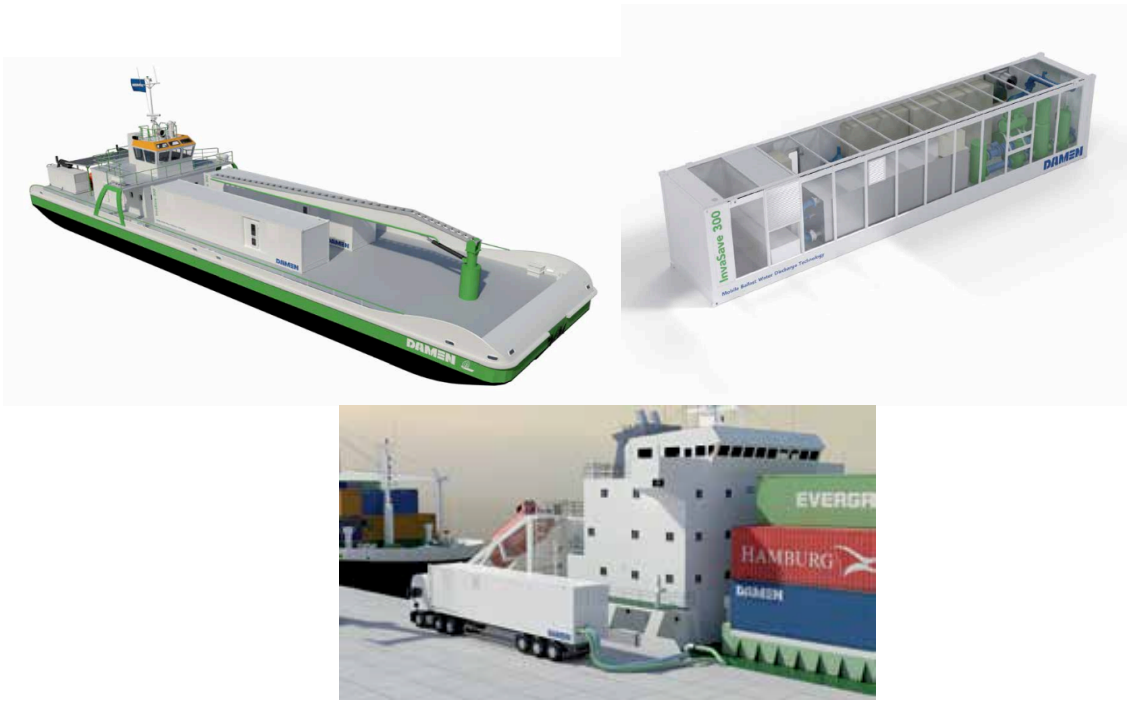

Fig. 1. A self-suficient mobile container INVASAVE 300 by Damen Shipyards Group

Source: www.damen.com

Fig. 2. Ballast water treatment in container designed specifically for the barge

Source: www.ballastwatercontainers.com

The simplest concept is the proposal to permit the use of potable water (that meets a drinking water standard and the standard D-2 is met at the same time) from an on-board water maker (see Fig. 3) or shore-side supplier. It can be especially useful as an alternative method for small ships or vessels with a small capacity of ballast water tanks (yachts, cruise liners, ro-ro ships), but which also can be considered as precautionary measures (e.g. for ships which deviate temporarily from the exempted route). The additional cost to purchasing/producing potable water is maintaining its quality in the tanks during the voyage.

Fig. 3. Potable water maker for small ships

Source: Establishing equivalency in the performance testing and compliance monitoring of emerging alternative Ballast Water Management Systems - A technical review, GloBallast Monograph Series No. 20; GESAMP Reports and Studies No. 83.

The other solution is a D-1 water exchange in designated exchange areas; however, it is only possible during the transition period. Moreover, in some geographical regions it seems to be infeasible. The Baltic Sea is a perfect example of such a region, because there are no areas at the Baltic Sea that meet the requirements for ballast water exchange (depth and the distance from the near land); therefore there are also no areas suitable for designation as areas for ballast water exchange according to IMO Guidelines G-14.

The contracting State or the port should determine the type of these measures, the system of financing their purchase and operation, efficiency and ownership of these facilities as well as the cost of ballast water reception.

In Poland no definite decision regarding the precautionary measures has been made so far and little is known in that regard. Considering the Polish geographical position, economic situation and financial capability of Polish ports it is not a viable solution to build a dedicated port reception facility for ballast water. The exchange of ballast water to D-1 standard is also not possible. The only viable solutions seem to be a mobile unit for ballast water reception and subsequent treatment on-shore by a BWMS or a mobile BWMS.

In some countries, including Poland, the ports/terminals that receive or load the oil, also organize receiving and processing the oily ballast water from oil tankers, so they also may provide this facility to shipowners and receive the ballast water in emergency situations. For example, the storage facility of private companies such as Comal, Ship-Service or Port-Service might be used, as well as barges for collecting the ballast water (Fig. 4). However, this water still needs to be treated by the suitable BWMS on-shore. Such solution requires relatively substantial financial resources and is subject to a decision of individual companies.

Fig. 4. The barge BA COMAL 9

Source: www.comal.pl

4. The fee system for collecting and treatment of the ballast water

There are different possibilities to establish the cost recovery system for reception facilities for waste and residues[15]. Considering the fee system for ballast water reception, the main requirements are that it should be designed to recover the recurring costs, be suited to the port specificity and should not encourage shipowners to non-compliance with the provisions of BWMC.

There are a lot of uncertainties over the development of the cost recovery system: the likelihood and frequency of situations in which there will be a need for receiving ballast water are impossible to predict; the same goes for the amount of ballast water that will have to be received and treated (this amount differs and depends, among others, on the ship type and the average capacity of ballast water tanks). The technical requirements should also be considered, as in some cases the reception of ballast water will be easy and in some very difficult, depending on the ship's construction.

From the range of possible solutions, the most appropriate in the case of ballast water reception and treatment would be a direct system, a combined system or a direct system supported by the elements of a contract system.

The direct fee system is the system which embodies the "polluters pay" principle. The fee could be established per tonne or cubic meter of ballast water discharged and will be required on the reception of the ship's ballast water. A port or a state, but also an independent company could be the one to provide the service. The port or PSC should inform shipowners about possible service provider for ballast water reception and treatment. The main disadvantage of this system is that it does not ensure a fixed income as the frequency of service is unpredictable.

If the combined system were introduced, every ship calling the port would be required to pay a fixed fee (as an additional fee to the port dues) which aim is to cover investments as well as operation costs of reception facility dedicated to ballast water. Additionally, the extra fee should be paid when the ballast water is collected.

Direct fee system supported by elements of a contract system could be a potential solution, in which the state authority/port sign a contract with a service provider for ballast water reception and treatment. The contract stipulates a fee for readiness of that company to provide and operate this service. This could be viewed in a good light by the shipowners, as it would enable them to deliver the ballast water without undue delay.

The choice between these systems depends on the type of the precautionary measure (onshore dedicated facility, mobile facility) and its ownership.

[15] The overview of these systems is presented in: IMO Comprehensive Manual on Port Reception Facilities, IMO, London, 1999.

Conclusion

The *International Convention for the Control and Management of Ships' Ballast Water and Sediments,* which was adopted in 2004 and will enter into force on the September 8, 2017, is an answer to the global problem connected with transfer of invasive organisms and pathogens between different water basins in the world.

The successful implementation of the BWMC depends on all parties involved in the maritime transport, especially shipowners, ports and maritime authorities. Unfortunately, the violation of the requirements of the BWMC cannot be avoided. The same applies to extraordinary situation that might happen during the ship's operation as a result of a failure or malfunction of BWTS. Although it is not an obligation of the port or the state to provide any kind of precautionary measures in those situation, it would be reasonable to develop a contingency plan and enable shipowners to proceed the handling operations and continue the voyage.

The BWMC will be ratified by Poland in a short time; however, nothing has been done so far to establish the precautionary measures. It would be a matter of regret if Poland was the only state in the Baltic Sea region that did not establish a contingency plan. To ensure that does not happen, the cooperation between ports, maritime authorities, PSC and other stakeholders is crucial.

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POSTĘPOWANIE AWARYJNE W PRZYPADKU BRAKU ZGODNOŚCI JAKOŚCI WÓD BALASTOWYCH ZE STANDARDAMI KONWECYJNYMI - MOŻLIWE ROZWIĄZANIA DLA PORTÓW POLSKICH

Streszczenie

Dnia 8 września 2017 r. wchodzi w życie *Międzynarodowa konwencja o kontroli i postępowaniu ze statkowymi wodami balastowymi i osadami* (Konwencja balastowa) uchwalona w 2004 r., która nakłada wiele obowiązków zarówno na armatorów statków, jak i na Państwa – strony konwencji. Celem niniejszego artykułu jest zaprezentowanie możliwych rozwiązań, które mogłyby być przyjęte w polskich portach jako środki awaryjne w przypadku, gdy statek nie przestrzega postanowień Konwencji.

Artykuł rozpoczyna krótka charakterystyka Konwencji oraz wprowadzonych jej postanowieniami standardów postępowania z wodami balastowymi (D-1 i D-2). W dalszej kolejności opisane zostały potencjalne okoliczności, w których statek może nie spełniać opisanych standardów. Główną część artykułu stanowi omówienie możliwych rozwiązań oraz środków zapobiegawczych, mogących mieć zastosowanie w przypadku niespełniania standardów konwencyjnych. Środki te są istotne w opracowaniu planu awaryjnego i dotyczą takich rozwiązań jak lądowe urządzenia odbiorcze dla wód balastowych, mobilne urządzenia odbiorcze, stosowanie wody pitnej jako wody balastowej itp. Artykuł kończy krótka analiza systemów opłat, mogących mieć zastosowanie w przypadku odbioru i obróbki wód balastowych.

Artykuł powstał w oparciu o wnikliwą analizę przepisów Konwencji balastowej i towarzyszących jej regulacji i wytycznych, a także wywiady z przedstawicielami portów oraz urzędów morskich krajów regionu Morza Bałtyckiego.

Słowa kluczowe: konwencja balastowa, postępowanie z wodami balastowymi, środki awaryjne, plany awaryjne

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