Scientific Journals
Maritime University of Szczecin

Zeszyty Naukowe
Akademia Morska w Szczecinie

2013, 33(105) pp. 16–21
ISSN 1733-8670

2013, 33(105) s. 16–21

Organisation of the reception of ship-generated wastes and cargo residues illustrated by selected examples of European Union seaports

Agnieszka Deja

Maritime University of Szczecin, Transport Engineering and Economics Faculty
70-507 Szczecin, ul. H. Pobożnego 11, e-mail: a.deja@am.szczecin.pl

Key words: ship-generated waste, cargo residues, seaports, sustainable transport, protection of the marine environment

Abstract

The paper presents key legal instruments governing the issues of the protection of the marine environment with respect to the management of ship-generated waste and cargo residues in European Union seaports. In view of the observed development of maritime transport, it is particularly important to organise the reception of wastes and cargo residues in seaports, in line with the principle of sustainable development. As a result of the harmonisation of the relevant legal regulations, Member States of the European Union and port and harbour authorities have taken a number of measures over the last few years to arrive at optimum solutions in this respect. The main objective of the paper is to analyse the existing system of environmental fees, the calculation criteria for such fees, and the techniques used in selected European Union seaports to submit ships' waste notifications. The research is aimed, inter alia, at determining which of the solutions that are now used in Rotterdam, Antwerp and Klaipeda could possibly be optimal for the ports in Szczecin and Świnoujście.

Introduction

The changes observed in the global economy are directly reflected in the magnitude, type structure and directions of transport. Activities involving intensive development of transport have led to the utilisation of more complex sources of energy, which affects the ecosystems. The negative environmental impact of transport is caused by a number of factors, including, for example, the type of means of transport, the geographical range, as well as the duration of the transport service. Due to the continuing development of the transport infrastructure, we are facing an escalation of activities causing harm to the environment. This situation forces the European Union to look for sustainable transport solutions. In accordance with the guidance provided in the White Paper, the priority for the European Union is to develop a competitive and resource efficient transport system, with the key role played by less polluting transport modes (rail and waterway). The objectives of sustainable development are met through the development of an environmentally focused mix of transport modes. One of the main objectives of the common policy of the European Union is to support the sustainable economic growth in marine sectors, while ensuring the highest standards of environmental protection. It is particularly important for the Community to support the development of the "blue economy", with a major role played by marine transport (shipping and ports). Shipping is one of the most environmentally friendly ways to move large quantities of cargo on long routes. According to the Blue Belt concept, the activities of European Union Member States should focus on the optimum utilisation of the potential arising from the common access to marine waters. Along with the increasing demand for marine transport within the European Union, increased numbers of ships handled by seaports should be expected. A higher number of calls means that seaports will have to address a range of new logistical challenges involving the optimisation of the receipt and further disposal of wastes and cargo residues generated by ships. The need to ensure the adequate number of reception facilities in seaports and to establish relevant administrative procedures to accommodate the increased vessel

traffic was pointed out, for example, in the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.

The problems of the management of ship--generated waste and cargo residues in the light of the law

Issues of the management of ship-generated waste and cargo residues[1] have been incorporated in a number of legal instruments in the field of the protection of the marine environment, the most important of them being international conventions, local agreements and EU directives. The most important international regulations governing the management of ship-generated waste and cargo residues include: the Marpol 73/78 Convention, the Helsinki Convention which covers the Baltic Sea region, and Directive 2000/59/EC.

The International Convention for the prevention of pollution from ships (MARPOL 73/78) contains, inter alia, the most important legal and technical standards for the design of ships, equipment ensuring ecological safety, technical equipment requirements for all types of vessels (oil separators, sewage treatment systems, pollution measuring equipment etc.), as well as guidance on discharges of pollution into marine waters. The MARPOL 73/78 Convention in force includes the general part and six adopted annexes, with two further annexes (VII and VIII) in the pipeline, intended to cover the issues of polluted ballast water and bulk cargoes carried as solids in bulk [2]. The Convention is particularly important for the national legislation, as the countries – parties to the Convention are required to consider its requirements when drawing up legal instruments covering the issues of the protection of the marine environment.

The Convention on the Protection of the Marine Environment of the Baltic Sea Area, known as the Helsinki Convention, is an international document governing the issues of the protection of marine waters against pollution from marine vessels, of particular importance to the countries of the Baltic Sea area. In accordance with its provisions, Baltic coastal states undertook to take a range of measures to support the protection of the marine environment. In its content, the Convention significantly extends and strengthens the requirements of MARPOL 73/78 with respect to the "Baltic Sea Area" [3]. With respect to the organisation of the reception of ship-generated wastes in seaports, the contracting parties are obliged, inter alia, to develop and apply uniform requirements for the provision of reception facilities for ship-generated wastes, with particular regards to passenger ships. Detailed guidance covering the above topics is provided in the *Baltic Strategy for Port Reception Facilities for Ship-generated Wastes and Associated Issues*. The document contains requirements for handling ship-generated waste, the arrangements for waste reception, as well as administrative guidance. In accordance with its provisions, the reception of waste from ships in seaports in the Baltic Sea Area should follow the no-special-fee principle. Before departure, each ship must deliver the waste carried on board, in accordance with the notification submitted beforehand. A penalty system is applicable to infringements of the principles of protection of the marine environment. Port operators are obliged, inter alia, to develop and implement port waste management plans for ship-generated wastes, and to equip their ports with special reception facilities [4].

The most important legal instrument governing the arrangements for the reception and management of ship-generated waste in seaports of the European Union is Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues. Under that Directive, Member States are obliged to arrange the reception of ship-generated waste and cargo residues in accordance with certain administrative procedures. The Directive imposes a range of waste management obligations, both on ports and on ships. These measures are aimed at, inter alia, reducing the illegal discharges of pollution generated during the service of ships into marine waters. The Directive allowed the Member States a high degree of freedom with respect to the use of the most suitable

[1] **Ship-generated waste** – "shall mean all waste, which are generated during the service of a ship and fall under the scope of Annexes I, IV, V and VI to the Marpol Convention and cargo-associated waste other than cargo residues as defined in the Guidelines for the implementation of Annex V to Marpol 73/78 – until the delivery to port reception facilities" – according to Article 3.4 of the Act of 12 September 2002, Journal of Laws of 2002, No 166, item 1361, as amended, on port reception facilities for ship-generated waste and cargo residues.
Cargo residues – in accordance with Article 3(5) of the aforesaid Act, these are defined as "the remnants of any cargo material on board in cargo holds or tanks which remain after unloading procedures and cleaning operations are completed and shall include loading/unloading excesses and spillage" [1].

tools to introduce its provisions into national law. Building on the Directive, each Member State has developed appropriate national legal instruments that are fully consistent with international regulations on the protection of the marine environment. Member States are obliged, inter alia, to ensure the suitable technical facilities necessary to receive ship-generated waste and cargo residues in their ports, and to ensure the administrative supervision for those facilities. Port reception facilities should handle all types of ships on an ongoing basis. The Directive does not impose any particular requirements on seaports as regards the organisation of the system of environmental fees, their calculation criteria, techniques used to submit waste notifications and the operators providing the service. In 2007, the sewage requirements of the Directive were extended, and sewage was added to the group of waste delivered to port reception facilities [5].

Arrangement of the reception of ship--generated waste and cargo residues in the light of the applicable regulations

Due to the harmonisation of the legal regulations governing waste management in the seaports of the European Union, it has been and it still is particularly important that each Member State develops its own financial and organisation mechanisms in this area. To implement optimum solutions, it is necessary to ensure the clear understanding and continuous monitoring of the pollution generated by particular types of vessels, which normally use port services. Pollution from ships, in accordance with the categorisation of MARPOL 1973/78, is divided into: oil, noxious substances, sewage, garbage, air pollution and ballast waters. International regulations allow (in keeping with certain procedures) the discharge of specified groups of pollutants into marine waters [6]. It should be stressed that wastes generated by marine vessels are particularly dangerous to the marine environment, as they contain high quantities of noxious substances, of which oily waste are the most dangerous to ecosystems. In view of the above, the optimisation of measures relating to the arrangement of the reception and further disposal of waste at sea ports should begin directly "at source". It is particularly important to use the best available technologies directly on board, to develop integrated systemic measures, to raise the environmental awareness of crews and to ensure the ongoing control of the procedures relating to the reception and further disposal of wastes in seaports on the basis of the applicable international and national regulations [7].

European Union promotes the use of state-of-the-art environmental solutions on ships, which will enable the efficient and environmentally sound handling of vessels in seaports. In accordance with the Community concept of "green ports", ships using environmentally friendly technologies will be dealt with more quickly and pay reduced harbour dues. Seaports are particularly significant hubs for transport activities in the European Union. Their operations play a major role in the protection of the marine environment. Pursuant to applicable regulations, European Union seaports are obliged to arrange the reception of ship-generated waste through, inter alia, providing the suitable technical facilities for such services. Ships, on the other hand, are obliged, inter alia, to submit notifications to seaports concerning waste and cargo residues carried on board during their journeys. On the basis of the notification submitted by the ship, the port is obliged to arrange the reception of waste. Feedback sent to ships contains detailed guidance, including information on the reception possibilities for particular groups of waste and cargo residues and the location of reception facilities. In a situation where the port is unable to receive the waste, the information is forwarded to the next port of call. Such an organisation of activities makes it possible to control the streams of wastes and cargo residues within European Union seaports.

Due to the ever-rising costs of waste management, the marine industry is obliged to develop optimum recycling technology solutions, both on board and in ports. An appropriate information flow between seaports and vessels is necessary to develop the best organisational solutions, in ecological, economic and technical terms. The proper arrangement of the reception of waste and cargo residues in seaports ensures the control over ship movements and compliance with the appropriate marine environment standards. For the sake of environmental protection, fees for waste and cargo residues delivered by ships should be optimum. The use of excessive rates for the services provided by seaports may be directly reflected in increased illegal discharges by ships, since it is particularly important to create such economic and legal tools owing to which illegal discharges of pollutants, which are dangerous to the marine environment, will be no longer profitable for ships. Shipowners should be encouraged to use devices and installations on their ships that will minimise the quantities of waste and cargo residues on board [8]. There are no regulations that would specify detailed criteria or guidance with respect to the design of systems of environmental fees. Directive 2000/59/EC requires

European ports to shift the costs involved in the operation of port reception facilities to ships, in accordance with the "polluter pays" principle adopted by the Community. The fee for the use of reception facilities should be paid by the party using the facilities. In accordance with HELCOM recommendations, ports of the Baltic Sea should use the no-special-fee principle when designing their fee systems.

Analysis of the process of the reception of waste and cargo residues in selected ports of the European Union

The analysis covered organisational and economic solutions for the arrangement of the reception of ship-generated waste and cargo residues developed on the basis of applicable regulations and used in selected ports of the European Union. The study was aimed at identifying how the experience of selected ports of the European Union could influence the optimisation of activities carried out in this area in the ports of Szczecin and Świnoujście. The findings of the study are provided in tables 1 to 4.

Summary and Conclusions

Considering the ongoing changes in marine transport, it has become necessary for the international community to take appropriate legal and economic measures focusing on the protection of the marine environment. In order to ensure the competitive but still sustainable development of marine transport, a number of environmental measures must be taken by seaports, which represent a particularly significant link in the marine transport chain. In view of the envisaged increase of cargo carried by sea within the European Union, the problem of proper management of ship-generated waste and cargo residues can be expected to aggravate. The strengthening of legislation in this area has led European Union Member States to look for optimum system solutions for waste management in ports.

The analysis carried out has shown that EU ports use very diverse economic solutions for the reception of waste and cargo residues from ships, which may indicate that an optimum model for the calculation of the environmental fee has not yet been found.

Table 1. Arrangements for the reception of waste and cargo residues in the ports of Szczecin and Świnoujście (own work on the basis of [9, 10])

Organisational and economic solutions	Advantages	Disadvantages	Comments
Charges – The fee for the reception of a limited quantity of waste is included in the tonnage dues, calculated on gross tonnage of vessels. The tonnage due is charged for ship handling in the port. – Limits are allocated on the basis of the location of the last port where waste was delivered. An additional fee is charged when the limit is exceeded. – Cargo residues are received according to tariffs applied by companies providing such services. **Waste notification** – Since April 2013, ship's waste notification must be submitted using an electronic form, which is integrated with PHICS (Polish Harbours Information & Control System). **Calculation criteria** – The limit on the quantity of waste delivered to port reception facilities depends on the location of the last port where the ship delivered waste. – An additional fee is charged for delivered waste exceeding the limit. – A special fee is charged for waste delivered under conditions other than those required by ZMPSiŚ SA. **In addition**: – There is a sewage treatment plant in the Port of Szczecin. – A harmonised ship-generated waste management system is in place at the ports of Szczecin and Świnoujście.	– Guaranteed delivery by a ship of a certain quantity of waste to port reception facilities. – The environmental fee calculation approach used by Zarząd Morskich Portów Szczecin i Świnoujście SA strongly reflects the *no-special-fee* concept, promoted by the Baltic Strategy. – Waste reception is in line with the "polluter pays" and "user pays" principles. – Ships' waste notification must be submitted to ports using an electronic form, which is integrated with the control and information system. Integration with PHICS should guarantee the effective control of ships with respect to delivered waste.	– The ports do not use preferential rates (exemptions) for ships equipped with modern, environmentally sound installations. – Arrangements with respect to the reception of wastes and cargo residues have been imposed by the legislator. – Polish ports are not free to set the fees for waste reception and management on their own. The tonnage dues are fixed by law. – Waste reception (within a certain limit) is included in tonnage dues, which have not been increased along with the introduction of the statutory obligation to collect ship-generated waste. – In the period from 2006 to 2010, only in 2010 the revenues from special and additional fees exceeded the costs of provision of reception facilities.	– Until April 2013, waste notification was only submitted in a traditional format (attached to PHICS as a PDF file). – Pursuant to the Regulation of the Minister of Transport, Construction and Maritime Economy of 17 January 2013 on the submission of notifications of waste on board ships (Journal of Laws of 11 January 2013, item 77), an electronic port notification format integrated with PHICS was introduced. – In practice, ships very often restrict the delivery to the specified quantitative limit.

Table 2. Arrangements for the reception of waste and cargo residues in the port of Antwerp (own work on the basis of [9])

Organisational and economic solutions	Advantages	Disadvantages	Comments
Charges – Each ship calling at the port is obliged to pay an environmental fee. – The fee is made up of two components (fixed and variable fee). The fixed fee is EUR 20, and the variable fee is EUR 45 (as at 2012), multiplied by the applicable factor, depending on gross tonnage and vessel type (according to *Lloyd's Register of Shipping* classification). The level of payments is subject to revision and depends, inter alia, on the costs of reception arrangements and further handling in the port. – Cargo residues are received according to tariffs applied by companies providing such services. **Waste notification** – Submitted by electronic means, using a special electronic form. **Calculation criteria** – The level of fees depends on vessel type and gross tonnage (applicable factors are set for particular vessel types). **In addition**: – It is possible to apply for a refund for certain waste groups delivered to port reception facilities (EUR 30 per m³ for oily waste, EUR 15 per m³ for garbage – as at 2012). – Ships using environmentally friendly technologies (e.g. propelled by environmentally friendly fuel) can apply for a reduction of the environmental fee.	– The system of environmental fees takes into consideration, among other things: the duration of the voyage, the type of fuel used, the number of crew members and the speed of the vessel. – The fee is calculated on the basis of certain vessel classification criteria (on a scale from 1 to 6). – The fee includes a fixed component and a variable component, which is subject to refunds. – The level of the environmental fee is subject to revision and is set in consultation with port authorities (adjusted to the current conditions). The level of the fee depends, inter alia, on the size and type of the vessel (factor values have been estimated on the basis of the port's statistics). – Preferential rates apply to ships using environmentally sound solutions. – Vessels may apply for refunds for the delivery of oily waste and garbage (the level of the refund is revised on a regular basis).	– Vessels applying for the refund are subject to a special administrative procedure.	– The existing organisational and economic solutions have been developed on the basis of a large number of variables. – The fees are subject to review. – The refund system is intended to encourage ships to deliver certain groups of waste to port reception facilities, which is beneficial to the marine environment. – Environmentally friendly solutions are promoted. – If the system was adjusted to the situation of ZMPSiS SA, it is very likely that the solution used to calculate the environmental fee would be economically beneficial.

Table 3. Arrangements for the reception of waste and cargo residues in the port of Rotterdam (own work on the basis of [9])

Organisational and economic solutions	Advantages	Disadvantages	Comments
Charges – An environmental fee is charged, made up of two components. The system of fees is based on indirect and direct financing. – Each ship calling at the port (with the exception of ships that are exempted pursuant to separate regulations) is obliged to pay an environmental fee before the call. – The port authority charges an additional administration fee for ship handling with respect to the reception of ship-generated waste, at the rate of EUR 15 (as at 2012). – Cargo residues are received according to tariffs applied by companies providing such services. **Waste notification** – Can be submitted using a traditional form or by electronic means. **Calculation criteria** – The level of the environmental fee is dependent upon main engine capacity – MEC. – The limit for the reception of domestic waste is based on the number of crew members. – Higher rates are charged for vessels delivering unsorted waste. **In addition:** – A harmonised ship-generated waste management system is in place in the Rotterdam-Rijnmond Port Region. – It is possible to apply for a refund for the delivery of certain waste groups (Annex I and V to MARPOL 73/78).	– The indirect fee covers the delivery of a certain limited quantity of waste (oily waste and garbage) to port reception facilities. – Ships must pay for the reception of waste, but may apply for reimbursements for certain waste groups. – The level of the environmental fee is dependent upon main engine capacity (MEC). – Ships using environmentally friendly technologies can apply for exemptions from fees for the reception of wastes covered by Annex I to MARPOL 73/78. – The fees are subject to review. – Environmentally friendly solutions are promoted.	– A limited group of waste is collected for the indirect fee. – The environmental fee obligation also applies to seagoing vessels which leave the port and return 4 hours later (unless it concerns a tide-bound ship which visits the Calandkanaal from the Nieuwe Waterweg or vice versa via the offshore separation buoy).	– The possibilities of adjustment to the Polish conditions are limited. Main engine capacity information is not collected. – The use of reimbursements for certain groups of waste is beneficial to the marine environment.

Table 4. Arrangements for the reception of waste and cargo residues in the port of Klaipeda (own work on the basis of [9])

Organisational and economic solutions	Advantages	Disadvantages	Comments
Charges – An environmental fee of 0.25 litas per GT unit is charged if a vessel stays at the port up to 10 days inclusive. The rate applicable from the 11th day for each following day is 0.025 litas per GT unit. – Cargo residues are received according to tariffs of companies providing such services. **Waste notification** – A form submitted to the port operator by the ship owner. – Calculation criteria. – The environmental fee is charged on the basis of the vessel's gross tonnage (GT). **In addition:** – There is a sludge treatment plant in the port. – Oily waste is collected by special boats, operating 24/7.	– A high environmental fee. This solution is economically beneficial for the port. – For the environmental fee, a ship may deliver any type of waste arising from the normal operation of the ship to port reception facilities.	– A high environmental fee. The solution is unfavourable to ships. – It is not possible to submit waste delivery notifications using an electronic form. – No preferential rates are used for ships equipped with innovative installations.	– If the system was adjusted to the situation of ZMPSiS SA, it is very likely that the solution used to calculate the environmental fee would be economically beneficial.

The system of fees should be reasonable, as it is directly reflected in the condition of the marine environment. The international regulations in force do not provide any specific economic guidance for seaports. Therefore, the criteria used by particular ports to calculate the environmental fee are very often based on the experience of their authors. With respect to the organisational solutions used by ports, the main focus was on the techniques used to submit waste notifications to seaports. Efficient submission of notifications from ships helps to optimise the operations of particular units in charge of waste and cargo residue management in ports. The study shows that the port in Klaipeda is the only port where EDI technology is currently not used for that purpose. It should be emphasised that pursuant to the most recent regulations, the ports of Szczecin and Świnoujście introduced the obligation to submit notifications of the wastes and cargo residues on board using an electronic form integrated with the PHICS control system as late as in April 2013.

On the basis of the solutions used in the ports under study, the process of reception of ship-generated waste in the ports of Szczecin and Świnoujście could become an optimum system provided that:

– the level of the environmental fee charged to ships would cover all costs relating to the maintenance of port reception facilities;
– it would not hamper the competitiveness of ports;
– the level of the fee would encourage ships to deliver all groups of waste to port reception facilities;
– the fees would be calculated according to criteria which would consider the types and sizes of ships;
– the level of fees would incorporate preferential rates (or even exemptions) for ships equipped with modern, environmentally sound installations.

References

1. Ustawa z dnia 12 września 2002 roku o portowych urządzeniach do odbioru odpadów oraz pozostałości ładunkowych ze statków, DzU z 2002 r. nr 166, poz. 1361 z późn. zm.
2. GRACZYK T., PISKORSKI Ł., SIEMIANOWSKI R.: Ochrona środowiska morskiego przed zanieczyszczeniami. PS, Szczecin 2001.
3. Convention on the Protection of the Marine Environment of the Baltic Sea Area, done at Helsinki, on 17 March 1992 Journals of Laws of 2000, No. 28, item 346, Article 1. The Diplomatic Conference on 9 April 1992 in Helsinki, stressed the need for the ecological restoration of the Baltic Sea area, and the new Helsinki Convention was adopted. The document in its new format includes 37 articles and 7 annexes.
4. GRUSZCZYŃSKI B.: Zasady i wytyczne w zakresie portowych urządzeń do odbioru zanieczyszczeń ze statków w portach morskich w świetle obowiązujących regulacji międzynarodowych. Zakład Wydawnictw Naukowych Instytutu Morskiego, Gdańsk–Szczecin 2001.
5. Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues (OJ L 332, 28.12.2000, as amended).
6. Międzynarodowa konwencja o zapobieganiu zanieczyszczaniu morza przez statki, 1973/1978 MARPOL, tekst jednolity, Polski Rejestr Statków, Gdańsk 2007.
7. Restructuring the maritime transportation industry. Global overview of sustainable development practices Transportaton systems, Québec 2007.
8. JÓŹWIAK Z.: Rola portu szczecińskiego w ochronie środowiska. W: Wpływ portów morskich na funkcjonowanie i rozwój otoczenia – red. K.Chwesiuk, Wyd. Kreos, Szczecin 2005.
9. DEJA A.: Analiza odbioru odpadów ze statków w portach morskich w Szczecinie i Świnoujściu. Praca doktorska, Uniwersytet Szczeciński, Szczecin 2012.
10. Rozporządzenie Ministra Transportu, Budownictwa i Gospodarki Morskiej z dnia 17 stycznia 2013 r. w sprawie przekazywania informacji o odpadach znajdujących się na statku, Dz.U. poz. 77 z dnia 11 stycznia 2013 r.