



Recommendations for improved and harmonised waste manage- ment on board and in ports

Carl Jensen

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Summary

This is the final report of the Baltic Master II subproject "*Recommendations for improved and harmonised waste management on board and in ports*" within the Baltic Sea Region Programme.

The aim of the subproject was to find practical solutions to improve waste handling with focus on oily residues and solid waste and to find out what can be achieved within existing legal framework. This in order to better prevent pollution from maritime transport, as differences exist among the countries bordering to the Baltic Sea regarding waste sorting on board ships and in port as well as in technical equipment when leaving sludge.

This report suggests a common waste sorting tool and uniform technical equipment to prevent discharges directly into the sea. It also presents a waste handling brochure template, which is intended to be used as a guide by Baltic Sea ports when constructing their own signboards and information sheets to ships.

The project hopes the proposed waste handling routines are spread and implemented by ships and ports around the Baltic Sea and thus contributing to a more cost effective handling and a better environment in the Baltic Sea Area.

The project is recognized as a flagship project in the Baltic Sea Strategy of the European Union, under priority area "To become a model region for clean shipping".

More information about the Baltic Master II project can be found at www.balticmaster.org.

1 Introduction

This is the final report of the Baltic Master II subproject "*Recommendations for improved and harmonised waste management on board and in ports*" within the Baltic Sea Region Programme.

1.1 Background

In order to decrease pollution of oily residues and waste in the Baltic Sea, conventions and regulations have been introduced. Action on pollution from ships and management of waste generated on board ships are governed by MARPOL 73/78 and reception of waste at port is regulated by the Helsinki Convention and by the European Parliament and Council Directive 2000/59/EC.

In Baltic Master I it was concluded that the maritime field have sufficient conventions and regulations in the area of waste prevention but that much can be done within the existing frames stated by the above mentioned regulations and conventions.

1.2 Aim and scope

The aim of the subproject was to find practical solutions to improve waste handling. This with focus on oily residues and solid waste and to find out what can be achieved within existing legal framework. This in order to better prevent pollution from maritime transport.

Particularly problems with waste management and deposit of oily residues have been addressed since differences exist among the countries bordering to the Baltic Sea regarding waste sorting on board ships and in port as well as in technical equipment when leaving sludge. This called for a common waste sorting tool and uniform technical equipment to prevent discharges directly into the sea.

By this report, the project hopes the proposed waste handling routines are spread and implemented by ships and ports around the Baltic Sea and thus contributing to a more cost effective handling and a better environment in the Baltic Sea Area.

The project is recognized as a flagship project in the Baltic Sea Strategy of the European Union, under priority area "To become a model region for clean shipping.

1.3 Chapter outline

This report first gives a description, in chapter 2, of present legislations, challenges and ongoing initiatives and projects regarding waste handling in the Baltic Sea.

In chapter 3, the work carried out in the project is described including the technical solutions developed.

Thereafter the proposed waste handling routines of sludge and waste which have been developed in the project are presented in chapter 4.

Finally in chapter 5, a designed brochure template giving general and brief information on waste handling is presented, which is intended to be used as a guide by other ports in the Baltic Sea Area when constructing their own signboards and information sheets to ships. Most of the symbols of the proposed waste fractions have been developed by Preemraff, Lysekil, Sweden and the port of Gothenburg, Sweden. Furthermore they have also purchased the copyright of the symbols. Permission has been given to Baltic Master II, to use the symbols in the report which the project is very thankful for.

1.4 Project organisation

The working group has consisted of representatives from the Regional Council in Kalmar County and the ports of Oskarshamn, Västervik and Kalmar, Sweden.

The reference group in the project has consisted of port representatives and other experts around the Baltic Sea. For a complete list of participants in the project, see appendix B.

The final report has been written by Mr Carl Jensen at the Swedish Environmental Research Institute.

2 Waste handling in the Baltic Sea

2.1 Present legislations, regulations and policies

2.1.1 MARPOL

Action on pollution from ships and management of waste generated on board ships are governed by international rules in MARPOL 73/78. The main purpose of the convention is to prevent discharges of oil, chemicals, sewage, solid waste and air pollution from ships at sea. The regulations concerning sludge and waste are the following:

- **Sufficient reception facilities:** All ports should be provided with sufficient reception facilities for oily residues such as dirty ballast, tank washing water etc. and waste. Furthermore the facilities must have enough capacity, not causing ships any undue delay. If the reception facilities are inadequate, the ship should also notify the port.
- **Placards of disposal requirements:** Every ship of 12 metres or more in length shall display placards notifying passengers and crew of the disposal requirements. Furthermore the placards should be in the official language of the ship's flag State and also in English, French or Spanish for ships travelling to other States' ports or offshore terminals.
- **Prohibition of waste disposal at sea:** Disposal of waste into the sea is illegal. This regardless if it's mixed or sorted. An exception is separated food waste which is allowed if it's disposed more than 12 nautical miles outside the coast.
- **Standard discharge connection:** All ships must have a standard discharge connection for the disposal of oily water. This in order to enable pipes of the oil reception facilities in the ports to be connected with the ship's discharge pipeline.
- **Waste management plans and record of waste:** All ships of 400 gross tonnages and above and every ship certified to carry 15 people or more must have established a waste management plan. This includes written procedures for collecting, storing, processing and disposal of waste, including the use of equipment on board. The waste management plan should also point out the person responsible for carrying out the plan and should be in the language spoken by the crew.

In addition, these ships must provide a waste record book, to record all disposal and incineration operations.

Also an oil record book should be available for inspection and should be documented for at least three years.

- **Inspection of ships and the right to retain ships:** When clear ground occurs for believing that the captain or crew are not familiar with essential shipboard procedures relating to the prevention of pollution of oil or waste, the ship is subject to inspection. If the set requirements have not been followed, the ship is not allowed to leave port until the requirements are met.

If traces of oil are observed in the vicinity of a ship, the government is responsible to investigate whether there has been a violation of any regulation.

2.1.2 Helsinki convention

The main aim of the convention is to regulate the reception of waste in ports. The regulations and articles concerning sludge and waste handling are the following:

- **Polluter pays principle:** This means that the polluter pays principle should be applied.
- **Mandatory discharge of waste in ports:** Before leaving port ships shall discharge all ship generated wastes to a port reception facility.

Examples of exceptions from mandatory discharge are in case of inadequate reception facilities and if the ship only carries minor amounts of wastes which are unreasonable to discharge to port reception facilities.

- **Prevention of pollution from ships:** Uniform requirements for the provision of reception facilities for ship generated wastes shall be applied.
- **Prohibition of incineration of waste on board:** Incineration of ship generated wastes on board ships is prohibited.
- **Prohibition of dumping at sea:** Dumping of waste in the Baltic Sea is prohibited. If dumping is suspected, contracting parties of the convention are obligated to investigate the matter.

2.1.3 The Baltic strategy for port reception facilities for ship generated wastes and associated issues

The strategy hereafter referred to as "The Baltic strategy" was an effort by the Helsinki Commission (HELCOM) in order to reduce the discharge of ship wastes at sea. It was entered into force for the entire Baltic Sea Area in 2000.

- **The no special fee:** This recommendation means a general waste fee, not dependent upon quantity of ship generated waste, shall be applied. This waste fee is included in the general harbour fee and should be charged regardless of whether the individual ship left waste or not.
- **Notification to port of a ship's waste delivery:** This means that a ship shall give notice to the port of its need to leave waste within 24 hours prior to arrival. If the voyage is less than 24 hours, the port must be notified before leaving the previous port.
- **Obligation to leave waste in ports:** It is mandatory for ships to deliver waste in ports. The Baltic countries have however agreed upon some exemptions under the conditions that it is possible to keep the waste on board until the next port. This for example, if the storage tank on board is not filled to more than a quarter and for certain fixed lines such as ferries sailing between designated ports under schedule.
- **Harmonized sanction systems:** The strategy means that a harmonized system of sanctions is to be applied across countries for ships, which have been found guilty of emissions in violation to regulations.
- **Transparency of waste treatment and related costs:** Ports should establish waste management plans showing estimated needs of reception facilities for the ship generated waste, the capacity of these and how the waste is disposed. The disposal of the waste should be carried out in an acceptable and environmentally sound manner.

Furthermore ports are required to account for to the ships how much of the port charges waste management costs represent. The waste management fees received from ships shall be used for no other purposes than investments, operation, repair and maintenance of waste reception facilities and costs of handling, treatment and final disposal of the received wastes.

To avoid competitive distortions between ports located in different sea areas, all possible efforts shall be made to achieve as soon as possible a harmonised waste management fee system for the ports in the Baltic Sea.

- **Capacity of storage of waste and information:** Ships should be equipped to be able to store waste on board. In addition, the generation of waste should be minimized and information systems should be developed to monitor the amount of waste on board individual ships.

2.1.4 European Parliament and Council Directive 2000/59/EC

The purpose of the Directive regarding port reception facilities for ship generated waste is to reduce the emissions of harmful substances and waste from ships. This by introducing regulations which allow an increase of access to

and use of reception facilities in ports around the Baltic Sea. It applies to all ships irrespective of their nationality. The directive is similar to the Baltic Sea strategy regarding its content but with some significant differences.

- **Obligation to leave waste in ports:** Ships are obligated to leave all the waste on board before leaving port. If there is a capacity to retain waste generated on board during the voyage to the next port, a ship may leave port without disposing waste.

The port have the right to claim the delivery of waste if it is known that there are no reception facilities at the next port, or if the next port is unknown or one could suspect that the waste will be discharged at sea.

- **Waste reception and waste treatment costs:** The general fee for the waste reception and waste treatment costs only needs to cover one third of the port's costs in the form of a fixed charge, while the excess costs may be covered by direct charges. This compared to the Baltic strategy, in which the corresponding costs are included in the general harbour fee ("the no special fee").
- **Undue delay in ports:** Everyone who is involved in handling or receiving of ship generated waste and cargo residues, in accordance with national law, can sue for damages caused by undue delay of waste disposals in ports.
- **Waste management plans:** All ports in the European Union should have waste management plans for both the ship generated waste and cargo residues. In addition member states shall evaluate and approve plans and monitor their implementation.
- **Supervision and inspection:** Between the member states appropriate information and monitoring systems are established to improve the identification of the ships which have not delivered their ship generated waste and cargo residues in accordance to the directive.

Member states shall ensure that all ships subject to inspection should verify that they have disposed their ship-generated waste in accordance to the directive and in accordance with MARPOL 73/78 requirements.

- **Sanction systems:** Member states shall determine the penalties for violating the national provisions adopted and take all necessary steps to ensure that these are implemented. The proposed measures must be effective, proportionate and dissuasive.

2.2 Challenges

There are today a number of challenges regarding waste management in ports and on ships in the Baltic Sea, which needs to be solved.

Uneven distribution of waste disposal in ports: Rules regarding the mandatory delivery differs from country to country. Within the European Union according to the Directive 2000/59/EC, ships shall deliver their ship generated waste at each port visit as key principle. However, ships may retain waste on board until the next port if the ship has enough room in their tanks and storage areas, leading to an imbalance between the ports. This as ports having better and more flexible waste management experience larger waste quantities and therefore higher costs (Swedish Maritime Organization, 2005).

A reason for the uneven distribution of waste in ports and thereby arised costs is because of the exceptions of leaving waste in every port are interpreted differently in the countries bordering to the Baltic Sea. More recently more and more countries around the Baltic Sea practice the exemptions and this to a greater extent, which initially were intended for ships such as ferries.

Need for a harmonized tariff: A harmonized tariff means that all ports around the Baltic Sea use the same principle to cover their costs for handling ship waste. Both the EU and HELCOM have developed regulations based on the "no special fee" system. However according to the EU directive only one third of the waste management costs in ports are covered by the "no special fee" system and the remaining costs are charged the ship owner. This regardless of whether the ship leave the waste in port or not. The corresponding financing for the Baltic strategy is 100 %.

This difference between the EU directive and HELCOM regulation cause a financial strain for the ports that strictly apply the "no special fee" principle. This as many of these ports cannot fully cover their costs for the reception of waste with the port charge, due to the competitive situation between ports. Another problem in the area is that it is quite common that the ports issue some sort of special overtime fee, when ships pump sludge outside office hours, in contradiction with the "no special fee" system.

Inadequacy of port reception facilities: Another challenge is that reception and treatment of ship waste must work in a coherent and effective way in all ports around the Baltic Sea. An efficient and environmentally sound waste management requires that the entire waste management chain work in a flexible manner - from the ships via reception facilities, transportation on land and final treatment. This means the reception facilities shall be accessible and have adequate equipment. According to several reports there is a discrepancy in opportunities to leave the ship wastes in several of the ports in the Baltic Sea. The reason for this may be partly lack of national legislation and poor planning. Another reason is insufficient reception port facilities (Swedish Maritime Organization, 2005).

Lack of uniform routines and guidelines: No uniform routines exist today regarding how to handle the interaction between ships and ports when dealing

with solid waste or oily water. The ships consider the problem to mainly consist of ports not having the facilities to receive sorted waste or delaying the ship by different actions when receiving sludge. The ports on the other hand consider the problem to be the ships not leaving the proper notification and also not sorting waste according to port instructions. Furthermore there are no guidelines regarding sorting of solid waste on board ships and no guidelines regarding the reception of the solid waste generated from ships by the ports.

2.3 Ongoing initiatives regarding waste handling on ships and in ports

2.3.1 Standardisation of waste handling on ships and in ports

As the waste fractions and waste containers vary between ports a need for an establishment of a standardised methodology exists. This would facilitate harmonisation of the various requirements and the waste disposal in ports. Today there are no implemented standards available regarding colour coding and labelling of generated waste fractions but shipping companies use their own developed standards. Today the International Organization for Standardization (ISO) is however developing two standards related to the subject, ISO 16 304 and ISO 21 070.

ISO 16 304 concerns arrangements, management and operation of port waste reception facilities and has an expected completion date of late February 2014.

ISO 21 070 which concerns management and handling of shipboard waste including a standard for reception bins and containers to be used at ports, labelling and colour coding of the generated waste fractions. The standard is expected to be completed in December 2011.

2.3.2 Tackling the inadequacy of port reception

The International Maritime Organization (IMO) has in 2010 completed a three year's work on an action plan in order to tackle the inadequacy of port reception facilities regarding waste handling and capacity. The action plan contained work items grouped in the following six categories (IMO, 2010).

- **Reporting:** This concerned the development of a "Standard Advance Notification Form" of waste to be disposed of by the ships and a "Waste Delivery Notification Form" which now have been adopted. This was done in order to decrease the risk of causing undue delay of ships in ports and to provide uniformity of records throughout the world.

- **Equipment technology:** This involved a survey of whether any technical obstacles existed which would complicate the waste disposal in ports. In the study no such technical challenges could be identified. The work item also involved the standard, ISO 21 070 where IMO has been involved in the work by reviewing and commenting the standard which is under development.
- **Types and amount of waste:** This work item concerned a review, of type and amounts of waste generated on ships and of the type and capacity of port reception facilities. By this, information on what kind of waste and the amounts generated on ships and delivered to ports was obtained. The information has been used as input to ISO developing the standards mentioned.
- **Information on port reception facilities:** This concerned increasing information on port receptions facilities and to make the information more accessible. This included for example assessment of port receptions facilities carried out and the outcome of it such as inadequacies and any technical co-operation assistance that may be needed. It also involved making waste management plans and detailed information of the port authority more easy to access.
- **Regulatory matters:** This item concerned the "IMO's manual on port reception facilities" in which areas needed to be updated were identified due to new legislations. The actual revision of the manual has not been initiated yet. It also involved the development of a Guide to "Good Practice on Port Reception Facilities" in which practical advices are found.
- **Technical cooperation and assistance:** This concerned the development of a programme to assist for example development countries in developing port reception facilities.

3 Work carried out in the three ports during the project

3.1 Hose cart and permanent pipe for oily sludge

To minimize the time of sludge delivery in port, a specially equipped hose cart and a permanent pipe for oily sludge have been developed in the project. In previous sludge handling procedures, the driver of the sludge vehicle had to connect the hose of the truck to the ship. This as the crew often was busy with unloading cargo.

Even though the coupling should be placed on deck it is very often placed in the engine room down below deck, why the driver had to bring the hose himself. As not being familiar with the ship and the exact position of the coupling and the fact that ships often are equipped with different couplings, this caused unnecessary time spent by the driver and thus large costs for the sludge handling.

In the new implemented routine, a sludge hose cart is provided by the port. This at least one hour before the sludge vehicle's arrival, until which the crew are obligated to have connected the hose to the coupling.

The sludge cart is equipped with:

- 20 meters (65 feet) hose with 2 1/2 " quick lock (camlock) coupling
- 4 meters hose for manual suction (suction from trough)
- reducer 2 1/2" coupling to 10" international standard manifold coupling
- reducer 2 1/2" coupling to 6" manifold coupling
- reducer 2 1/2" coupling to 3" coupling
- 2 x 25 litres oil pollution absorbent
- 1 broom



Picture 1. Sludge hose cart being connected to the ship.



Picture 3. The sludge hose cart at the dock.



Picture 2. Sludge vehicle at the dock.



Picture 4. Connection of sludge hose on board.

The installation of a sludge hose cart and a permanent pipe has proven to save a lot of time and therefore costs of sludge waste handling compared to the former routines. Estimations have shown time savings of about two hours for every sludge discharge. Based on 70 sludge discharges from ships annually, the investment cost for the sludge hose cart is paid off in less than four months.

Other advantages identified are:

- a better cooperation between sludge truck, ship and port.
- a better understanding of all personnel involved in the operation.
- a safer work environment for drivers as they do not have to enter unfamiliar and risky environments such as engine rooms.

3.2 Waste collection cart

The ports have also developed and implemented a waste collection cart consisting of several waste containers for waste separation. Upon request, the ship is provided with a waste cart at the gangway. This service is requested by ships wanting an easy disposal of the waste.



Picture 5. Waste collection cart.

3.3 Development and implementation of waste handling routines

Besides the development of the technical solutions described above, the ports have also developed waste handling routines which have been implemented and evaluated, see chapter 4. In this work, a suggestion on waste fractions to be sorted on ships and in ports has also been developed.

The overall motive for the proposed waste fractions has been to improve the environmental performance with respect to the end of life treatment of the waste generated from ships. The key is to sort the waste at the source in order to allow the optimal treatment for the respective fractions. This as different fractions require different kind of treatments. The waste fractions suggested are based on the existing waste hierarchy within EU prioritizing different treatment options for waste, the existing producer's responsibility and the existing waste treatment infrastructure.

Waste hierarchy: The waste hierarchy consists of the six steps prevention, minimization, reuse, recycle, energy recovery, and disposal. http://en.wikipedia.org/wiki/Waste_hierarchy_-_cite_note-1

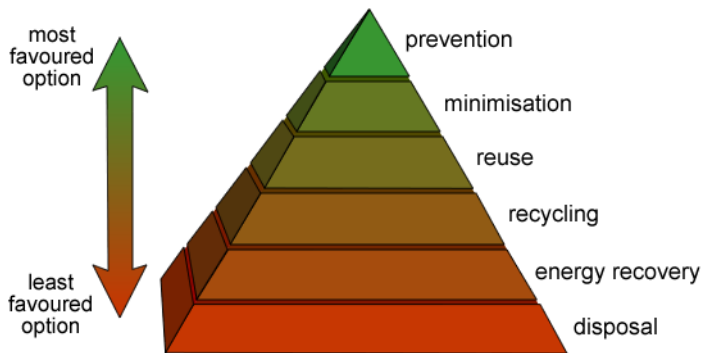


Figure 1. Waste hierarchy within EU.

From which actual waste has been generated, the most favourable measurement is recycling, which refers to material recycling, in which materials making up the waste can be used again. The environmental benefits of material recycling compared to production using raw materials based on virgin material differ between waste streams but are in general very high. For example using recycled steel instead of virgin material decrease the energy consumption by about 85 %. The corresponding decrease for aluminium and paper is 95 % respectively 70 % (The Swedish Recycling Industries, 2011).

In the process of energy recovery, the energy content is recycled. This through for example incineration, where the energy is recovered through the production of heat and/or electricity, or anaerobic digestion, in which the energy content is recovered by the production of biogas. In the incineration process, organic substances are also safely destroyed which in some cases are considered as favourable from an environmental point of view compared to material recycling.

The least favourable measurement is landfilling, in which neither the material nor the energy is recycled. Important to remember however is in some cases landfilling could be the most favourable option. This for example when materials due to their properties are not supposed to be recycled where asbestos, mercury are such examples.

Producer's responsibility: The producer's responsibility has been implemented through a number of EU directives in the EU legislation. This for a number of products such as packaging materials, electronics, batteries and light sources. The legislation is used as a financial incentive to encourage manufacturers to design environmentally friendly products by holding producers liable for the costs of managing their products at end of life. This practically obligates the person who generates the waste to separate the waste included in the legislation.

The existing infrastructure of the waste treatment: Different instruments such as legislation, taxes etc. have caused a gradual improvement of the waste

management infrastructure and how the waste is treated. Even though differences occur between countries surrounding the Baltic Sea regarding how different waste fractions are treated today, the project has described the treatment of the different fractions based upon the present conditions in Sweden and comments from the reference group.

4 Proposed sludge and waste handling routines

Within the existing legal framework described in Chapter 2, the project has developed the following waste handling routines.

4.1 Sludge handling

4.1.1 Routines

Ships shall 24 h before arrival, submit a form for sludge disposal, see Appendix A¹.

When the form is received, the port orders a specific sludge vehicle from an external waste collection contractor, stating the time and dock. The time when the sludge vehicle can arrive at the dock and start pumping, is reported back to the local agent of the ship who in turn notifies the crew.

At least one hour before the sludge vehicle's arrival, the port provides the ship with a sludge hose cart.

After the sludge vehicle has collected the waste, it is transported to a certified treatment facility in which the waste is treated in an environmentally sound manner.

After the waste has been collected, the waste collection contractor submits a receipt of the amount transported and treated and notifies the port. After the invoice has been controlled, the amounts are documented.

The harbour staff issues a receipt of disposed amounts to the crew.

The received amounts are documented in the port's annual environmental report and in the waste management plan.

4.2 Waste handling

4.2.1 Routines

Ships shall 24 h before arrival submit a waste handling form for the waste to be disposed of, see Appendix A. In the form the waste is specified with respect to

¹ Based on IMO standard format of the advance notification form for waste delivery to port reception facilities (MEPC.1/Circ.644).

types and amounts. Also an estimation of the future amounts of waste to be disposed of in the next harbour of arrival must be specified.

The local agent informs the crew of the ship about the waste reception facilities and the procedures for waste disposal. This is done by submitting the port regulations brochure, in which the locations of the existing facilities are stated and in what fractions the waste should be separated. Upon request, the ship is provided with a waste collection cart at the gangway for an easy disposal of the waste.

The waste is collected by certified waste contractors after which the waste is treated in an environmentally sound manner.

After the waste has been collected, the waste collection contractor submits a receipt of the amount transported and treated and notifies the port. After the invoice has been controlled, the amounts are documented.

The harbour staff issues a receipt of disposed amounts to the crew of the ship.

The received amounts are documented in the port's annual environmental report and in the waste management plan.

4.2.2 Waste fractions to be sorted on ships and in ports

The project suggests the following fractions to be sorted out on ships and in ports. Note that the suggestion only includes waste generated from the actual operation of the ship where cargo residues, wood, ballast water, grey water and sewage are not included.

Non hazardous waste

Plastic packagings: This fraction includes all sorts of hard and soft empty plastic packaging materials such as bottles, boxes, bags and foils, which are material recycled.

Newspapers: In this fraction newspapers, brochures, flyers, catalogues and office papers are found, which are sent to material recycling.

Paper packagings: This includes milk- and juice cartons, cardboards etc., which are material recycled.

Corrugated cardboard: This fraction is sent to material recycling and should be separated from paper packagings.

Coloured glass jars and bottles: This fraction includes bottles, glass, cans and jars etc., which is sent to material recycling. The fraction has to be separated from the non coloured glass fraction in order to be recycled.

Non coloured glass jars and bottles: This fraction includes bottles, glass, cans and jars etc., which is sent to material recycling. The fraction has to be separated from the coloured glass fraction to be recycled.

Scrap metals: Waste making up this fraction includes scrap metals (aluminium, steel etc.) such as cans, tins, buckets, tubes, lids etc. The fraction is sent to material recycling.

Food waste: This fraction includes leftovers from kitchens, cafeterias and restaurants. Sorting of the fraction enables composting or anaerobic digestion of the waste after which nutrients are returned to the soil as fertilizer within agriculture or to landscaping purposes.

Deep frying oil: Oil leftovers from cooking are to sorted and put into separate containers. Sorting of the fraction enables composting and anaerobic digestion of the waste after which nutrients are returned to the soil as fertilizer within agriculture or to landscaping purposes.

Residual waste: This fraction includes domestic waste not found in any of the categories found above and not being bulky or hazardous waste. This fraction is generally sent to incineration even though landfilling does occur in some countries around the Baltic Sea.

Hazardous waste

Batteries: Batteries contain hazardous substances such as lead and mercury, which in the recycling process is separated followed by a proper treatment. The batteries also contain rare metals which are highly beneficial from an environmental point of view to material recycle.

Electronic waste: This fraction includes all sorts of electrical appliances, besides light sources, which contain batteries or have an electrical cord such as TV:s, Hi-fi and toys. In the following dismantling process, hazardous components which are not motivated from an environmental view to be recycled for example mercury, PCB and flame retardants, are identified and separated followed by a proper treatment such as incineration. In the dismantling process also components possible to reuse are identified and separated. Other parts of the products are separated such as covers, cords and printed circuit boards which are sent to material recycling.

Paints and solvents: This fraction includes paints as well as solvents such as acetone, gasoline, lighter fluid and paint thinner. The waste is incinerated after

which the metal content is separated from the ash and sent for material recycling.

Low energy lamps and LED lamps: Low energy lamps contain mercury which is a hazardous substance and require special treatment. In the recycling process, the mercury is separated and stabilised after which it is either material recycled or put to a controlled landfill. The other parts of the lamps are separated into metals and glass etc. after which they are material recycled.

Fluorescent tubes: These types of lights contain mercury which is a hazardous substance and therefore require being treated separately. In the recycling process, the mercury is separated and stabilised after which it is either material recycled or put to a controlled landfill. The other parts of the lamps are separated into metals and glass etc. after which they are material recycled.

Light bulbs: In this fraction traditional light bulbs are found. The lamps contain a small amount of lead in the socket which is a hazardous substance, which in turn requires separation from the other materials.

Liquid oils: This fraction includes liquid oil remainings such as motor oil, hydraulic oil and transmission oils etc. The discarded oil can either be incinerated or purified after which new oils can be produced.

Oil filters: The filters are sent to incineration in which the oil remainings are destroyed and the energy content recovered after which the metal is recycled.







Solid oil waste: The fraction contain engine room waste, oily waste in drums and oily cottons and rags which are sent to incineration.

Aerosols: Discarded aerosol cans are sent to incineration, after which the metal cans are separated from the ash and sent to material recycling.


Other hazardous substances: If other hazardous substances not found in the categories above, the receiving harbour must be informed 24 hours before arrival. Information that should be given is type of waste, amount, state (solid, liquid, gaseous) and precaution measurements if necessary.

Waste fraction signs

Hazardous waste

	Batteries	
	Electronics	such as TV:s, Hi-fi and toys
	Paints and solvents	such as acetone, gasoline, lighter fluid and paint thinner
	Compact fluorescent lamps	such as low energy lamps and LED
	Fluorescent tubes	
	Light bulbs	
	Liquid oils	such as motor oil, hydraulic oil and transmission oil
	Oil filters	
	Solid oil waste	such as oily waste in drums and oily cottons and rags
	Aerosols	such as aerosol cans

Non hazardous waste

	Plastic packagings	such as bottles and foils
	Newspapers	such as newspapers, brochures, flyers and catalogues
	Paper packages	such as milk- and juice cartons
	Corrugated cardboard	
	Coloured glass	such as jars and bottles
	Uncoloured glass	such as jars and bottles
	Scrap metals	such as cans, tins, buckets, tubes and lids
	Food waste	such as leftovers from kitchens, cafeterias and restaurants
	Deep frying oil	such as oil leftovers from cooking
	Residual waste	waste not found in any of the categories above and not being bulky or hazardous waste

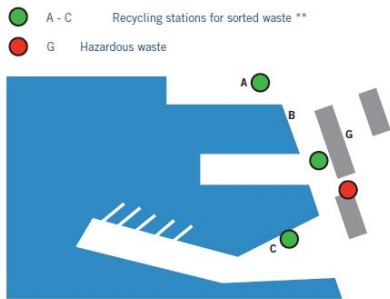
5 The waste handling brochure template

The waste handling brochure template developed in the project, shown in this chapter is intended to be used as a guide and adapted by Baltic Sea ports when constructing their own signboards and information sheets to ships. By this, the project hopes the proposed waste handling routines are spread and implemented by ships and ports around the Baltic Sea and thus contributing to a more cost effective handling and a better environment in the Baltic Sea Area.

The waste handling brochure template can be downloaded from www.balticmaster.org.

Most of the symbols of the proposed waste fractions have been developed by Preemraff, Lysekil, Sweden and the port of Gothenburg, Sweden. Furthermore they have also purchased the copyright of the symbols. Permission has been given to Baltic Master II, to use the symbols in the report.

Furthermore, the suggested colour coding to be used as a standard is adapted to the coming ISO 21 070, which is expected to be completed in December 2011.



CONTACT LIST ***

Emergency.....

Security Frontgate

Harbour Master

Waste Manager

Local Agent

** Related to: MARPOL Annex V, Regulation 7, MARPOL Annex V, regulation 5(4)(a) Important to have an easy access to recycling stations
 *** Related to: The importance of resolving any questions fast, thereby not giving the opportunity to regress to old behaviour (i.e. not recycle).

**Welcome to the Baltic Sea
 and the port of**



Waste Management

BalticMasterII

European Union
 Baltic Sea Region
 Programme 2007-2013
 Part-financed by the European Union
 (European Regional Development Fund)

Figure 2. Front and back of the brochure template.

For your convenience all ports in this area regulated by the Helsinki Convention are equipped and work in a similar manner¹ when it comes to sludge and waste handling. They are running according to a "no special fee"-system². This means that a fixed fee will be added to your harbour fee irrespective of whether waste or sludge is delivered or not.

We would like to inform you that all disposal of waste into the sea³ as well as incineration⁴ onboard is prohibited. In general, you are always obligated to discharge all ship-generated wastes, including sludge, to the port reception facility, before leaving port⁵.

Please make sure that your equipment is suitable for discharging sludge at a minimum of 5 m³/h in accordance with current regulations⁶.

For more information please visit: <http://www.helcom.fi/>

We hope that you will have a pleasant stay and a safe journey. If you wish to deliver waste or sludge please notify the port 24 hours in advance⁷ using standard form available at www.balticmaster.org

1 Related to: Helsinki Convention, Article 8.2
 2 Related to: Helcom Recommendation 28E/10
 3 Related to: Marpol Annex V, Regulation 5(2)
 4 Related to: Helsinki Convention, Article 10
 5 Related to: Helsinki Convention Annex IV, Regulation 6
 6 Related to: Marpol Annex I, Regulation 13
 7 Related to: Helcom Recommendation 23/1

Other hazardous substances:
 If other hazardous substances not found in the categories to the right, the receiving harbour must be informed 24 hours before arrival. Information that should be given is type of waste, amount, state (solid, liquid, gaseous) and precaution measurements if necessary.
 * Related to: Important to have clear and easy instructions, thereby making it easy to create the habit of recycling

Recycling procedures*

When visiting our reception facilities you are required to follow these procedures:
 - Deliver sorted waste to the recycling stations shown on the map
 - Hazardous waste containers must be tightly closed and permanently marked
 - If the waste is inappropriately sorted, the vessel will be invoiced in accordance with the additional costs caused by further waste treatment

All of your ship generated waste shall be recycled in the following categories:

Hazardous waste	Non hazardous waste
Batteries	Plastic packaging such as bottles and foils.
Electronics such as TVs, Hi-Fi and toys	Newspapers such as newspapers, brochures, flyers and catalogues
Paints and solvents such as acetone, gasoline, lighter fluid and paint thinner	Paper packages such as milk- and juice cartons
Compact fluorescent lamps such as low energy lamps and LED	Corrugated cardboard
Fluorescent tubes	Coloured glass such as jars and bottles
Light bulbs	Uncoloured glass such as jars and bottles
Liquid oils such as motor oil, hydraulic oil and transmission oil	Scrap metals such as cans, tins, buckets, tubes and lids
Oil filters	Food waste such as leftovers from kitchens, cafeterias and restaurants
Solid oil waste such as oily waste in drums and oily cottons and rags	Deep frying oil such as oil leftovers from cooking
Aerosols such as aerosol cans	Residual waste waste not found in any of the categories above and not being bulky or hazardous waste

Figure 3. Information and recycling procedures in the brochure template.

6 References

- The Swedish Recycling Industries, 2011, www.recycling.se, "Climate benefits of recycling", Downloaded 110509
- IMO's Action Plan on tackling the inadequacy of port reception facilities (2010), www.imo.org, "IMO's Action Plan on tackling the inadequacy of port reception facilities", Downloaded 110429
- Swedish Maritime Organisation, "Implementation of the Baltic Strategy in Sweden", 2005

Appendix A- Notification form for waste delivery to port²

² Based on IMO standard format of the advance notification form for waste delivery to port reception facilities (MEPC.1/Circ.644) presented in “Guide to Good Practice for Port Reception Facility providers and users”, IMO MEPC.1/Circ.671.

Notification of the Delivery of Waste to: (enter name of port or terminal)

The master of a ship should forward the information below to the designated authority at least 24 hours in advance of arrival or upon departure of the previous port if the voyage is less than 24 hours. This form shall be retained on board the vessel along with the appropriate Oil RB, Cargo RB or Garbage RB.

DELIVERY FROM SHIPS (ANF)

1 SHIP PARTICULARS

1.1 Name of the ship:		1.5 Owner of operator:	
1.2 IMO number:		1.6 Distinctive number or letters:	
1.3 Gross tonnage:		1.7 Flag State:	
1.4 Type of ship <input type="checkbox"/> Oil tanker <input type="checkbox"/> Chemical tanker <input type="checkbox"/> Bulk carrier <input type="checkbox"/> Container			
<input type="checkbox"/> Other cargo ship <input type="checkbox"/> Passenger ship <input type="checkbox"/> Ro-ro <input type="checkbox"/> Other (specify)			

2 PORT AND VOYAGE PARTICULARS

2.1 Location/terminal name and POC:		2.6 Last Port where waste was delivered:	
2.2 Arrival Date and Time:		2.7 Date of Last Delivery:	
2.3 Departure Date and Time:		2.8 Next Port of Delivery (if known)	
2.4 Last Port and Country:		2.9 Person submitting this form is (if other than the master):	
2.5 Next Port and Country (if known):			

3 TYPE AND AMOUNT OF WASTE FOR DISCHARGE TO FACILITY

MARPOL Annex 1 - Oil	Quantity (m3)
Oily bilge water	
Oily residues (sludge)	
Oily tank washings	
Dirty ballast water	
Scale and sludge from tank cleaning	
Other (please specify)	

MARPOL Annex II - NLS	Quantity (m3)/Name
Category X substance	
Category Y substance	
Category Z substance	
OS – other substances	
MARPOL Annex IV - Sewage	Quantity (m3)

MARPOL Annex V – Garbage Baltic Master II recommendations			
Non hazardous waste	Quantity (m3)	Hazardous waste	Quantity (m3)
Plastic packagings		Batteries	
Newspapers		Electronic waste	
Paper packagings		Paints and solvents	
Corrugated cardboard		Low energy lamps and LED lamps	
Coloured glass jars and bottles		Fluorescent tubes	
Non coloured glass jars and bottles		Light bulbs	
Scrap metals		Liquid oils	
Food waste		Oil filters	
Deep frying oil		Solid oil waste	
Residual waste		Aerosols	
		Other hazardous substances	

Name of the ship: _____	IMO Number: _____
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Please state below the approximate amount of waste and residues remaining on board and the percentage of maximum storage capacity. If delivering all waste on board at this port please strike through this table and tick the box below. If delivering some or no waste, please complete all columns.
 I confirm that I am delivering all the waste held on board this vessel (as shown on page 1) at this port.

Type of waste	Quantity of waste to be handled (m ³)		Maximum dedicated storage capacity (m ³)	Amount of waste retained on board (m ³)	Port at which remaining waste will be delivered (if known)	Estimate amount of waste to be generated between notification and next port of call (m ³)
	Ordered	Received				
MARPOL Annex 1 - Oil						
Oily bilge water						
Oily residues (sludges)						
Oily tank washings						
Dirty ballast water						
Scale and sludge from tank cleaning						
Other (please specify)						
MARPOL Annex II - NLS						
Category X substances						
Category Y substances						
Category Z substances						
OS – other substances						
MARPOL Annex IV - Sewage						
Sewage						
MARPOL Annex V – Garbage BM II recommendations*						
Hazardous waste						
Plastic packagings						
Newspapers						
Paper packagings						
Corrugated cardboard						
Coloured glass jars and bottles						
Non coloured glass jars and bottles						
Scrap metals						
Food waste						
Deep frying oil						
Residual waste						
Other kind of waste						

I assure that the above information is correct.

Date: _____ Name and Position: _____
 Time: _____ Signature: _____

Waste in greycoloured column (no 2) received:
Date: _____ Signature : _____

Appendix B- Working group and Reference group members

Working group members:

- Carlstedt Carl-Johan, Managing Director, Västerviks Logistics and Industry, Sweden
- Gunnarsson Carolina, Sustainability officer, The Regional Council in Kalmar County, Sweden
- Johansson Ola, Manager, Kalmar City, Sweden
- Karlsson Lennart, Development manager, Municipality of Oskarshamn, Sweden
- Nilsson Bruno, Development manager, Municipality of Västervik, Sweden
- Nordheim Carl-Johan, Managing Director, Port of Kalmar, Sweden
- Petersson Jonas, Production manager, Port of Kalmar, Sweden
- Sjöblom Anders, Market Development, Port of Oskarshamn, Sweden
- Wahlberg Rolf, Coordinator of "Waste management in Ports", The Regional Council in Kalmar County, Sweden
- Winquist Claes, MD, Port of Oskarshamn, Sweden

Reference group members:

- Bialowas Edyta, Environmental specialist, Port of Gdynia, Poland
- Bilz Helmuth, Operation Manager, Port of Wismar, Germany
- Hall Lennart, Environmental Coordinator, Port of Copenhagen-Malmö, Denmark/Sweden
- Harms Ortwin, Captain, Port of Lübeck, Germany
- Heijari Juha, Project Manager, Kotka Maritime Centre, Finland
- Kalli Juha, University student of Industrial Engineering and Management, University of Turku, Finland
- Klingström Anders, Technical specialist, Swedish Transport Agency, Sweden
- Klyuev Vitaly, Ministry of Transport of The Russian Federation, Russia
- Kraus Andreas, Prof. Dr., College of Bremen, Germany
- Kümler Hans, Port Director, Port of Rönne, Denmark
- Lizuma Sandra, Environmental specialist, Freeport of Riga, Latvia
- Lyytikäinen Paavo, Port Director, Port of Hangö, Finland
- Makuskiene Dalia, Klaipeda County Governor's Adm, Lithuania
- Müller Mattias, Environmental coordinator, Municipality of Trelleborg, Sweden
- Nörgaard Gert, Manager, Port of Copenhagen-Malmö, Denmark/Sweden
- Paide Martin, Head of Maintenance, Port of Tallin, Estonia
- Parinov Peter, Administration, Port of St. Petersburg, Russia
- Piotrowicz Jakub, Manager, Maritime Institute, Gdansk, Poland
- Platkowska B, Environmental Dept., Port Szczecin, Poland
- Rudeberg Gun, Head of Environmental Affairs, Port of Stockholm, Sweden
- Rust Mattias, Conservation Officer, WWF Baltic Sea, Sweden
- Rusth Jensen Annelie, Sustainability Coordinator, Transatlantic, Denmark
- Skowrouska Katarzyna, Environment Protection, Szczecin and Swinoujscie, Poland
- Stalnionyte Rasa, Project Manager, Port of Klaipeda, Lithuania
- Strömqvist Niclas, Managing Director, Port of Mönsterås, Sweden
- Sundberg Lars, Harbour Master, Port of Stockholm, Sweden
- Vähi Margus, Member of the Board, Port of Sillamäe, Estonia
- Wahlberg Lars, Head of operation, Port of Visby, Sweden
- Wallinder Anne, Environmental Engineer, Port of Stockholm, Sweden
- Vuori Esa, Senior inspector, Port of Rauma, Finland
- Väätt Janis, Specialist of maintenance department, Port of Tallin, Estonia

www.balticmaster.org

Baltic Master II is a flagship project in the EU Strategy for the Baltic Sea region that brings together countries from around the whole Baltic Rim. Its aim is to improve maritime safety by integrating local and regional perspectives with cross-border cooperation. This involves increasing the land based capacity to respond to maritime oil spills and working to prevent pollution from maritime transport. The project runs from January 2009 to January 2012.