



**INTERNATIONAL MARITIME STATISTICS FORUM (IMS F) ANNUAL
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SIGNIFICANCE OF PORT RECEPTION FACILITIES (MARPOL Convention, Annex 4) for maritime environment protection



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MARPOL Convention 73/78

Regulations for the Prevention of Pollution by Sewage from Ships

Helsinki Convention – for the Baltic Sea

Both documents introduce very restricted regulations for the Baltic Sea

All kinds of pollution should be avoided.

According to MARPOL 73/78 regulations Baltic Sea is a specially protected sea area due to its exposure for degradation.

Annex IV of MARPOL

Prevention of Pollution by Sewage from Ships

Revised sewage standards

In 2009-2011 new proposal for MO regarding changes in Annex IV in order to grant a special status to Baltic Sea. Proposal approved on 21 session of IMO - MEPC Resolution 00(62) from 15 July 2011.

Resolution introduces changes to Annex IV in order to declare Baltic Sea a Special Area for preventing pollution by sewage from ships.

It will be applicable for:

- New passenger ships from 1 January 2016,**
- Already operating passenger ships after 1 January 2018.**

All passenger ships on the Baltic Sea shall then be obliged to the treatment of sewage in their treatment plants before discharging it to the sea or handle it to the land based treatment plants (Port Reception Facilities).

All Baltic states should adapt their largest ports to fulfill the regulations by 2015.

Changes in guidance of IMO MEPC resolution

Rezolucja IMO MEPC. 2(VI) WYTYCZNE IMO 03-12-1976		Rezolucja IMO MEPC. 159(55) WYTYCZNE IMO 01-01-2010	
STANDARD	METODA BADAŃ	STANDARD	METODA BADAŃ
<p>LICZBA BAKTERII COLI POCHODZENIA KAŁOWEGO</p> <p><input type="checkbox"/> < 250 kolonii/100 ml</p>	<p><input type="checkbox"/> analiza fermentacji wielopróbkowej</p> <p><input type="checkbox"/> inna odpowiadająca procedura analityczna</p>	<p>LICZBA BAKTERII TERMOODPORNYCH COLI THERMOTOLERANT COLIFORM STANDARD</p> <p>< 100 kolonii/100 ml</p>	<p><input type="checkbox"/> filtracja membranowa</p> <p><input type="checkbox"/> fermentacja wielopróbkowa lub</p> <p><input type="checkbox"/> równoważna procedura analityczna</p>
<p>CAŁKOWITA ZAWIESINA STAŁA W ŚCIEKACH</p> <p><input type="checkbox"/> próby na łądzie < 50 mg/l</p> <p><input type="checkbox"/> próby na statku < 100 mg/l</p> <p>w odniesieniu do ilości zawiesin stałych w splukującej wodzie sanitarnej;</p>	<p><input type="checkbox"/> analiza zawiesin stałych prowadzona zgodnie z metodami grawimetrycznymi zatwierdzonymi przez administrację</p>	<p>CAŁKOWITA ZAWIESINA STAŁA W ŚCIEKACH</p> <p><input type="checkbox"/> próby na łądzie < 35 mg/l</p> <p><input type="checkbox"/> próby na statku</p> <p>35 + x mg/l</p> <p>x – współczynnik korekcyjny odniesiony do ilości zawiesin stałych w splukującej wodzie sanitarnej</p>	<p><input type="checkbox"/> filtracja reprezentacyjnej próbki przez filtr 0.45 µm, suszenie w 105°C i ważenie;</p> <p><input type="checkbox"/> wirowanie reprezentacyjnej próbki (co najmniej 5 min) z przyspieszeniem 2,8-3,2 g, suszenie w 105°C i ważenie;</p> <p><input type="checkbox"/> inny akceptowany międzynarodowo uznany test odpowiadający ww. metodzie</p>
<p><input type="checkbox"/> 5 DNIOWE BIOCHEMICZNE ZAPOTRZEBOWANIE TLENU BZT 5 < 50 mg/dm³</p> <p><input type="checkbox"/> CHEMICZNE ZAPOTRZEBOWANIE TLENU CHZT Brak normy</p>	<p>Administracja powinna upewnić się, że oczyszczalnia zmniejsza zarówno rozpuszczalne i nierozpuszczalne substancje organiczne</p>	<p><input type="checkbox"/> BZT 5 < 25 mg/l</p> <p><input type="checkbox"/> CHZT < 125 mg/l</p>	<p><input type="checkbox"/> metoda badania dla BOD5 ISO 5815-1:2003</p> <p><input type="checkbox"/> metoda badania dla COD ISO 15705:2002</p> <p><input type="checkbox"/> inny akceptowany międzynarodowo uznany test odpowiadający ww. metodzie</p>
<p>ODCZYN KWASOWOŚCI ROZTWORU PH</p> <p>Brak normy</p>		<p><input type="checkbox"/> 6 < Odczyn PH < 8.5</p>	<p>Próbki pobrane podczas testu oczyszczalni</p>

PORÓWNANIE INNYCH WYMAGAŃ REZOLUCJI

WYMAGANIA	Rezolucja IMO MEPC. 2(VI) WYTYCZNE IMO 03-12-1976	Rezolucja IMO MEPC. 159(55) WYTYCZNE IMO 01-01-2010
CZAS TRWANIA BADAŃ ORAZ	Minimum 40 próbek ścieku oczyszczonego w ciągu 10 dni (przy min., maks., oraz średnim obciążeniu objętościowym oczyszczalni)	<input type="checkbox"/> ta sama ilość i czas 40 próbek ścieku oczyszczonego w ciągu 10 DNI <input type="checkbox"/> 4 próbki na dzień (maks. 1 x, min. 1x, średnie obciążenie 2x)
CZĘSTOTLIWOŚĆ PRÓBKOWANIA	Odpowiednia ilość próbek ścieków surowych	<input type="checkbox"/> Próbkę ścieku surowego pobrana dla każdej próbki ścieku oczyszczonego (w sumie 40 próbek)
POZOSTAŁOŚCI PO DEZYNFEKCJI	<input type="checkbox"/> Tak małe jak jest to możliwe	<input type="checkbox"/> < 0,5 mg/l
TESTY ŚRODOWISKOWE DLA URZĄDZEŃ KONTROLNYCH I CZUJNIKÓW	<input type="checkbox"/> Nie obowiązkowe <input type="checkbox"/> Brak określonych metod badań i norm	Załącznik Część 3, rezolucja MEPC.107(49) mająca zastosowanie dla testów wibracji, wilgotności i prób przechyłów
OZNAKOWANIE	<input type="checkbox"/> Typ <input type="checkbox"/> Model <input type="checkbox"/> Nazwa wytwórcy	Dodatkowo umieszczone: <input type="checkbox"/> data produkcji <input type="checkbox"/> ograniczenia eksploatacyjne lub instalacyjne
PODRĘCZNIK INSTALACJI, DZIAŁANIA I OBSŁUGI	Podręcznik powinien być sprawdzany przez Administrację	<input type="checkbox"/> Podręcznik powinien być sprawdzany przez Administrację <input type="checkbox"/> Statek musi zawsze posiadać taki podręcznik zawsze na burcie
SZKOLENIE ZAŁÓG	- brak wymagań	Szkolenie załogi powinno obejmować zaznajomienie się z działaniem i obsługą oczyszczalni ścieków

Exceptions from Annex IV

Due to the technical or operational failure:

When the ship is dumping the waste because of safety and security of the ship and people on board

or

Failure of ship or its equipment if all necessary precautions have been taken in order to prevent the amount of dumping

Number of cruise and ferry passengers in Baltic Sea Ports on 2010

Port	Cruisers		Ferries	
	passengers	calls	passengers	calls
Gdańsk	16 753	40	147 877	333
Gdynia	134 895	96	350 585	635
Goeteborg	35 598	34	1 754 000	9 964
Helsingborg	25 509	13	9 415 041	42 159
Helsinki	361 236	264	9 011 000	8 475
Karlskrona	1 268	3	350 781	752
Kiel	291 388	115	1 491 097	1 096
Kłajpeda	33 512	50	272119	789
Kopenhaga	675 000	331	772 334	0
Lubeka	30 000	23	360 000	7 000
Nynashamn	19 322	5	1 381 001	1 468
Oslo	269 998	146	2 259 554	1 031
Ryga	138 703	88	552 805	463
Rostock	160 000	113	2 128 900	5 839
Rønne	21 864	15	1 499 424	3 297
Sassnitz	25 945	19	690 061	1 827
St. Petersburg	428 550	323	-	-
Tallin	416 605	310	6 841 040	5 115
Trelleborg	0	0	1 056 076	5 784
Visby	36 005	52	1 628 581	1 450
Ystad	-	-	1 693 126	3 315

MAIN POLLUTION FROM SHIPS AND TOURISM

- **Crude oil, fuel, sludge- accidental and deliberate oils-spills result in pollution of beaches and extinction of seabirds and fish;**
- **Transport of dangerous goods and radioactive cargo;**
- **Water used for container cleaning;**
- **Sanitary waste from toilets and cargo holds;**
- **Organic waste;**
- **Air pollution from ships;**
- **Anti fouling paint;**
- **Microorganisms;**
- **Plastic and glass containers often thrown away by tourists**

Inshore waters are most endangered by pollution from ships and sea tourism

Types of waste

GREY WATERS (from kitchen, laundry, dining)

BLACK WATERS (from bathrooms, toilets)

Estimated amount of waste water: 2 m³ - 4,3 m³ /person/day

Total waste of 1 passenger/crew per day by type (est.):

- 1,5 kg garbage**
- 150 l black water**
- 40 l kitchen water**
- 140 l gray water**

Dumping the waste in the port or port entrance is forbidden (except grey waters). It must be removed by specialized equipment and companies

(in practice sometimes only 10-20% of total amount of waste calculated by ship calls is removed in some ports)

EFFECTS OF HIGH CONCENTRATION OF SEWAGE

entering the marine environment from recreational ships and boats

Oxygen depletion - When sewage decomposes it uses up oxygen from the surrounding water the amount of oxygen available for fish and other aquatic animals and plants may be insufficient.

Disease - Sewage can contain disease causing bacteria and viruses which pose a risk to public health for swimmers and those eating contaminated shellfish.

Nutrient enrichment - when present in high concentrations nutrients can be responsible for the formation of algal blooms which reduce light penetration through the water column, may produce toxins and can cause oxygen depletion.

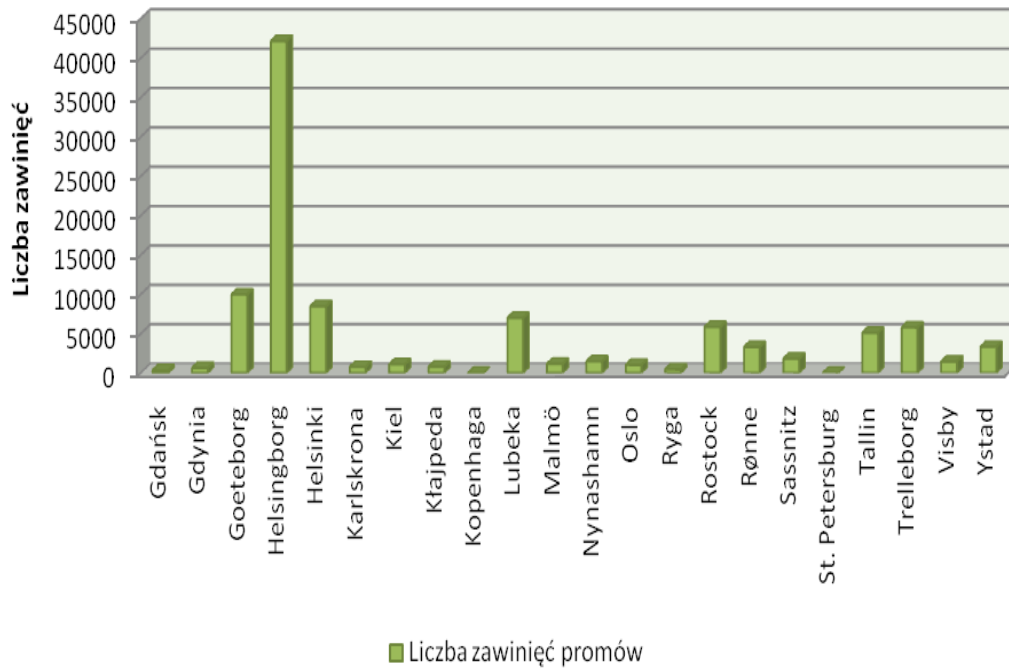
There has been little or no research made on the amounts of sewage discharged into port and harbour areas during operational shipping or recreational activities.

The major contributor to aquatic pollution in estuary and coastal areas is human sewage from population centres that is discharged from waste treatment plants.

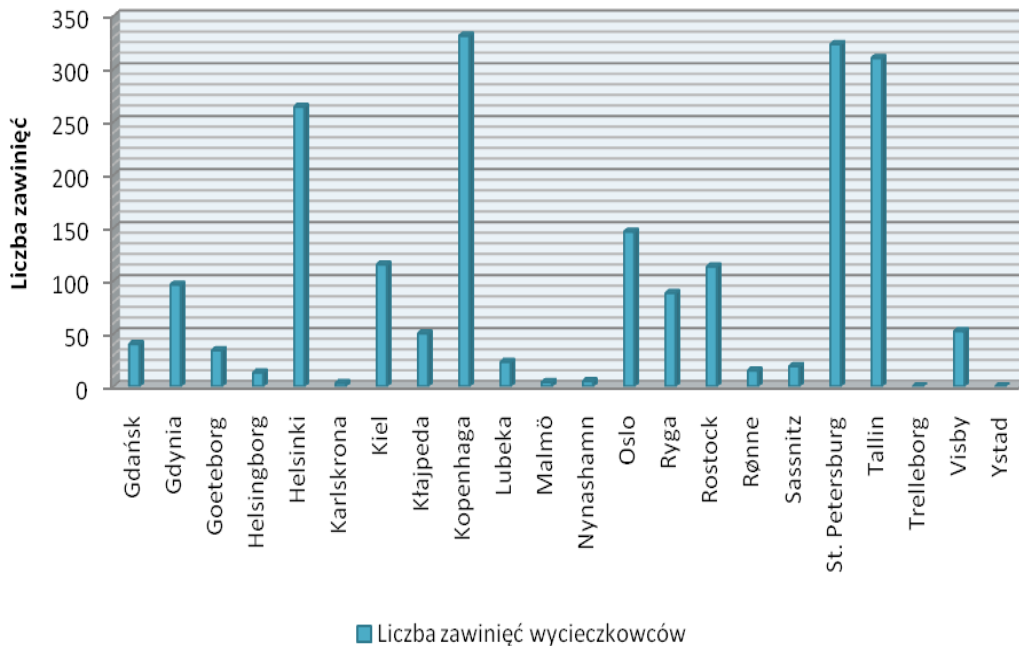
The adverse health, environmental and aesthetic impacts from sewage contamination in recreational coastal areas are documented, and continually monitored

Baltic Sea ferry and cruise traffic in w 2010 (number of calls)

FERRIES



ca 3 million passengers per year
average 1 400 passengers per call



CRUISERS

Plan of modernisation of port reception facilities (from Baltic ports priority list)

Port	Type of connection to prf (2010)	Exemption from charges (2010)	Additional information
<u>Tallin</u> (Estonia)	Rail and truck tanks, lack of direct prf pipe system on berth	Yes; charges from each ship and additional fee for waste over powyżej 7m ³	Permanent points of reception in old berth directly connected with the town plant
<u>Rostock</u> (Germany)	Rail tanks, lack of direct prf pipe system on berth	yes	Plans to connect the prf with town plants Rostok-Warnemunde
<u>Copenhagen</u> (Denmark)	Rail tanks, lack of direct prf pipe system on berth	yes	Plans for investment completion in 2013
<u>Riga</u> (Latvia)	Truck tanks, lack of direct prf pipe system on berth	Fixed fee for each m ³ of waste	Research and analysis stage. Completion of investment planned at 2017
<u>Gdynia</u> (Poland)	Truck tanks, lack of direct prf pipe system on berth	1/3 of waste exempted from fee	Modernisation of whole sewerage system in the port, completion by 2015
Helsingor (Denmark)	no	yes	
Rodby Faergehavn	no	yes	
Świnoujście (Poland)	no	yes	Prf connected with the city plants but insufficient capacityj. Truck tanks in use

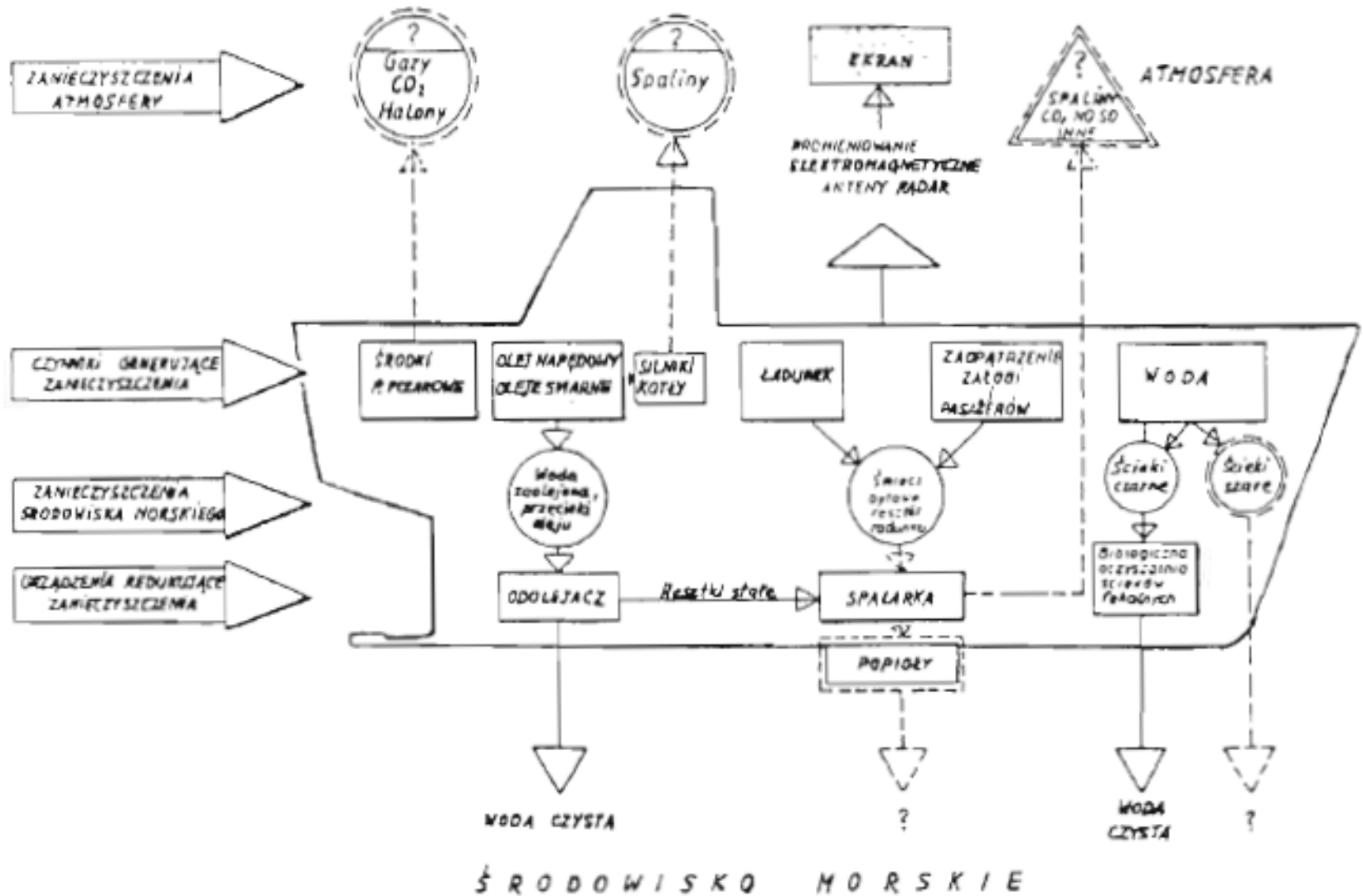
Source: Baltic Port List and countries administrations data for 2007 – 2009)

Charateristics of shiptypes on the Baltic Sea (data for 2008)

Ship type	Code	Number of ships	Engine (w kW)	Additional engine
Feefer	RC	338	2 515 171	732 664
General cargo	GC	2172	5 546 590	1 302 312
Tanker crude oil	T_PROD	270	1 854 899	362 987
Container	CONT	324	5 283 246	1 158 465
Chemicals	T_CHEM	842	5 126 000	1 508 702
Tanker	T_CRD	332	4 254 381	761 446
Bulk cargo	BULK	936	7 137 109	1 104 540
RO-RO	RO-RO	165	1 744 183	442 945
RO-PAX	RO-PAX	226	3 437 141	774 072
Car carrying ship	V	208	2 622 450	502 378
Gas tanker	T_PLG	119	611 003	171 076
Cruisers	PAS_CR	80	2 016 636	350 079

System of waste treatment and sources of pollution from ships

SYSTEM REDUKCJI ZAMIECZYSZCZEŃ NA STATKU



Waste treatment on board

Waste treatment on large passenger ships is similar to land based plants. The waste are dumped 3 nm from shore after being neutralised.

Polish ferries remove gray waters directly to the sea after former neutralisation on board.

„Scandinavia” for 1800 people est. gray water output per trip is 250 m³.

The ship is equiped with bioblck plant.

At the moment, compulsory transfer of waste to port reception facilities for ex. in Świnoujście or Gdańsk will require each time 5 containers of ca 100 m³ on berth or barge. It is arduous for ferries spending shrt time in the port. Operations in ports are expensive for shipowners.

(the analysis show that after treatment by ship plans the parameters of water are better than from land based plants.

Analizy wskazują, że wody zrzucane z promu (po procesie oczyszczenia na promie) mają parametry lepsze aniżeli te, jakie są uzyskiwane w oczyszczalniach portowych na polskim wybrzeżu Bałtyku.

Annex IV, Regulation 8 - Discharge of Sewage

Discharge of sewage into the sea is prohibited, except when:

- the ship is discharging comminuted and disinfected sewage using a system approved by the Administration in accordance with Regulation 3(1) at a distance of more than 4 nm from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land.**
- the sewage stored in holding tanks shall be discharged at a moderate rate when the ship is en route and proceeding at not less than 4 knots,**
- the rate of discharge shall be approved by the Administration based upon standards developed by the Organization, or**
- the ship has in operation an approved sewage treatment plant which has been certified by the Administration to meet the operational requirements referred to in Regulation 3(1) and the test results of the plant meet are in line with the ship's International Sewage Pollution Prevention Certificate (1973);,**
- the ship shall not produce visible floating solids in, nor cause discolouration of, the surrounding water...**

WASTE RECEPTION PLAN

received to Port Waste Facilities

INFORMATION ON WASTE RECEPTION

- Reception procedures
- Types of waste
- Important remarks
- Waste recipients

TYPES OF WASTE

- Oil waste, sludge, oil filters, bilge waters etc.
- Solid waste (organic waste from kitchen, plastic etc.)
- Sanitary waste
- Remainings from fume treatment

WASTE RECEIPTS- GDAŃSK :

- | | |
|----------------------------------|---------|
| • Oil waste | company |
| • Solid waste | company |
| • Sanitary waste | company |
| • Remainings from fume treatment | company |

WASTE MANAGEMENT PLAN

Information related to the type and amount of waste from ships predicted in the particular period

Description of actions taken in the terms of waste handling

- Procedures of waste reception
- Methods of putting waste into containers, their segregation and storage
- Preliminary processing
- Methods of transport
- Recycling methods
- Methods of waste neutralization

Description and location of Port Reception Facilities (efficiency and capacity)

Information related to fees system for waste handling

PORT FEES

(Port of Gdansk example)

Tonnage fee (EUR/GT) - ca. 6000 EUR/1 calling at port

Ro-ro, car carriers	0,14 – 0,20
General cargo ships	0,45
Container ships	0,22
Bulk carriers	0,51
Passenger ships	0,13
Ferries	0,09
Tankers	0,57 - 0,64











Tonnage fees include fees for waste reception from ships according to fixed standards (m3):

Type of waste	Location of the last calling in port		
	Baltic Sea	Northern Sea	Remaining basins oil
products	3,0	7,0	12,0
solid waste	0,5	0,6	0,7
sanitary waste	3,0	6,0	7,0











Ferries	0,65
Passenger ships	1,10
for disembarkation (EUR per 1 passenger)	

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

Challenges

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.

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 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 - 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

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.

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More information about the Baltic Master II project can be found at:

www.balticmaster.org



More information about the Clean Baltic Sea Shipping project can be found at:

www.clean-baltic-sea-shipping.se

