Chapter 6

CONTROL OF SHIP GENERATED SEWAGE AND GARBAGE IN PORTS

The United Nations Conference on the Human Environment, Stockholm, 1972, observed that, “the capacity of the sea to assimilate wastes and render them harmless and its ability to regenerate natural resources are not unlimited”. Yet, ports are polluted to a considerable extent by the sewage and garbage from ships. Illegal discharge of sewage and garbage into the port waters was reported in many ports in India in the recent past. There was a petition filed before the High Court of Kerala for restricting the dumping of sewage and garbage from the visiting vessels in the Cochin Port area and public places1. Under the international law, the discharge of sewage and garbage into port area is strictly prohibited, albeit, restricted discharge is permitted only beyond the territorial limits. Still, illegal discharging during routine vessel operations is quite common in India.

The vessels calling at ports may illegally discharge into oceans plastic fishing gears and worn out nets, fishing pots and strapping bands from bait boxes, plastic containers and untreated sewage from their toilets and kitchen2. A UNESCO study quotes the United States Coast Guards3 that almost 52% of the U.S waters are polluted by marine plastics dumped from recreational and fishing

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3 Hereinafter to be referred to as the USCG
boats. As per the United Nations Environment Program the volume of plastic litter floating over the oceans is estimated over 13,000 pieces on every square kilometer. It was also reported that 46,000 pieces per square mile or 18,000 per square kilometer has also been produced. From the equator to the Polar Regions, all oceans are being contaminated by marine debris. Therefore it is a global form of pollution.

Scientific studies establish that plastics and synthetic materials are the most prominent and harmful type of marine debris that have caused injuries and deaths to almost over 267 endangered species of oceans either by entanglement or ingestion. The entanglement of packing bands and synthetic ropes used for fishing and drift nets may cause serious threats to the marine mammals, leading to their mortality. Plastic scrubbers once discarded into the oceans may concentrate heavily on surface waters and are easily dispersed by currents. Plastics thus floating may be possible pathways for alien species like the bacteria, diatoms, algae. Drifting plastics may thereby induce bio invasions. Thus, “Marine debris is one of the world’s most pervasive pollution problems affecting the oceans”. Marine debris means “manufactured or processed solid materials, typically waste, that enters into the ocean

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4 *Id.*

5 Herein after to be referred to as the UNEP


9 Ibid

10 *Supra* n.2
environment from any source”11. 80% of the marine debris is from land based sources and 20% is from ocean based sources. Merchant ships and fishing vessels are the major ocean based contributors of this form of pollution.

The disposal of sewage waste in ports causes numerous environmental and health hazards. The presence of nitrogen and phosphorous in the sewage may bring about eutrophication, inducing massive growth of algae and other phytoplankton. It may also cause ‘Red tide’ that will deteriorate the growth of commercial fishes in the region. The bacteria, viruses and other parasites in the untreated sewage may cause diseases to people engaged in recreational activities along the contaminated beaches.

The illegal discharge of garbage and sewage from merchant ships offers significant threat to port environment and marine diversity. Often prosecutions are very rare as the exact source of pollution is often difficult to identify.12 Hence, it is important that this form of pollution need to be properly controlled. In India, till date, no significant steps have been taken to control ship generated waste. In real practice, licensees of ports handle these waste and the administrations have not realized the crucial environmental threats associated with this practice. With the increase in the number of ships visiting ports, the waste production is also on the rise. Consequently, port waste management needs to be addressed in a structured and systematic way so as to ensure environmental protection and a viable economic and operational system to fulfill the international requirements.

**Evolution and Development of International Law on Control of Ship Generated Sewage and Garbage**

There were some significant efforts by the international community to preserve the oceans from Ship generated wastes. Initially, “Throw it into ‘Davy


12 Jose G.B. Derraik, *Supra* n.7, at p.842
Jones’ “Locker” was generally the policy when the vessels used to simply throw into the oceans ship generated waste overboard\(^\text{13}\). The Stockholm Declaration made it a point that “…the discharge of toxic substances or of other substances … in such quantities or concentrations as to exceed the capacity of the environment to render them harmless must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems”\(^\text{14}\). The states shall strive to adopt all possible methods to prevent marine pollution from such discharges\(^\text{15}\). There were no proper waste management plans for vessels except, the prevention of pollution under the OILPOL 1954 scheme, which had limited application mainly over the control of oil pollution by tankers. The London Convention on the Prevention of Marine Pollution by the Dumping of Wastes and other Matter\(^\text{16}\) was another major legislation that prevented dumping of land sourced waste into the oceans. As dumping means the “waste materials carried into the sea for disposal, particularly from land based sources”, the provisions of the LDC are not applicable to ship sourced discharge of sewage and garbage, which is basically categorized under operational pollution from vessels.

Before the Annexures IV and V of MARPOL were enacted, the international law on dumping, the customary international law under the UNCLOS regime and regional and multilateral agreements were not regulating ship generated solid wastes and sewages. Annexures IV and V and the Guidelines to Annex V of the MARPOL 73/78 are the international law on control of sewage and garbage disposal in ports.


\(^{15}\) Id., Principle 7

\(^{16}\) Herein after to be the LDC
Sewage includes,

“drainage and other wastes from any form of toilets, urinals, and WC scuppers; drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises; drainage from spaces containing living animals; or other waste waters when mixed with the drainages defined above”\(^\text{17}\).

Garbage finds several new descriptions under the revised Annex V. It includes,

“animal carcass (es), cargo residues, cooking oil, domestic wastes, fishing gear, food wastes, incinerator ashes, operational wastes and plastics”\(^\text{18}\).

Cargo residues may be in any form including oil cargo residues under Annex I, noxious liquid substances under Annex II and liquid cargo residues from dry cargo under Annex V. Cargo residues if not mentioned under other Annexures of MARPOL 73/78 would fall under Annex V definition of garbage. Hence, the definition of ‘garbage’ under Annex V includes solid bulk cargo residues and liquid cargo residues from dry cargo\(^\text{19}\).

**Discharge Standards for Sewage under MARPOL Annex IV\(^\text{20}\)**

Annex IV regulates the discharge of sewage into the oceans by providing for sewage treatment plants on board of the vessels, by obligating the ports and terminals to provide for sewage reception facilities and by means of surveys and certification. Accordingly, every sea going vessels should have an

\(^\text{17}\) MARPOL Annex IV, reg. 1.3

\(^\text{18}\) Id., Annex V, reg. 1.9

\(^\text{19}\) Ibid

\(^\text{20}\) Entered into force on 27\(^{th}\) September 2003 and was revised on 1\(^{st}\) August 2005, See, http://www.imo.org/OurWork/Environment/PollutionPrevention/Sewage/Pages/Default.aspx, last accessed November 2013
International Sewage Pollution Prevention Certificate\textsuperscript{21}, which is issued by the concerned flag state. As per the revised Annex every ship of 400 gross tonnage and above carrying 15 or more persons need to have equipped with an approved sewage treatment plan on board or a sewage comminuting or disinfecting system or at least a holding tank.

Sewage may be in the form of black or grey water. Black water includes, ‘solid human waste and waste from medical facilities’. This is an important form of pollutant discharged mainly by the cruise ships. Annex IV does not allow discharge of any form of sewage within 3 nm from the shores, but, treated sewage may be discharged at a distance of 12 nautical miles\textsuperscript{22} from the land. In any case, ‘raw sewage’ should be discharged only into the high seas\textsuperscript{23}.

Grey water includes non-sewage waste water that results from showers, dish washings and laundry. These discharges may contain nitrogen, phosphorous and faecal coliforms, but there are no discharge restrictions for grey water under the MARPOL 73/78 beyond 3 nm.

The international law completely prohibits the discharge of all forms of sewage into the port environment.

Latest amendments are made to Annex IV by means of Marine Environment Protection Committee Resolution\textsuperscript{24}. Accordingly, discharge standards are set for special areas including the Baltic Sea. The MEPC. Res.

\textsuperscript{21} Here in after to be referred to as the ISPP

\textsuperscript{22} Herein after to be referred to as nm


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159 (55) sets effluent standards and performance standards for sewage treatment plants on board of vessels.

Discharge Standards for Garbage under MARPOL Annex V\(^{25}\)

Garbage means to “include all kinds of food, domestic and operational waste, excluding fresh fish, generated during the normal operation of the vessel and liable to be disposed of continuously or periodically”\(^{26}\).

Annex V “restricts discharge of garbage and bans disposal of plastics and other synthetic materials such as ropes, fishing nets, and plastic garbage bags at sea with limited exceptions”\(^{27}\). It also directs governments to provide sufficient port reception facilities for proper disposal of garbage from vessels.

All ships above 400 gross tonnage and in voyage with more than 15 persons need to maintain a garbage record book to record all discharge and incineration tasks\(^{28}\). This requirement has been revised in the new Annex and accordingly, new categories of garbage and various recording requirements have been introduced. Similarly, all such ships should have a Garbage Management Plan, to include “written procedures for collecting, storing, processing and disposing of garbage, including the equipment on board”\(^{29}\). The Garbage Management Plan should designate the officer in charge and should be in the working language of the crew.

\(^{25}\) Entered into force on 31\(^{st}\) December 1988

\(^{26}\) Ibid


\(^{28}\) Id., Reg. 9

\(^{29}\) Ibid
Ships that are 12 metres in length or more and fixed or floating platforms have to display placards notifying the crew and passengers of the MARPOL Annex V requirements. The Annex prohibits discharges of any garbage from fixed or floating platforms and from any ship alongside or within 500m of a fixed or floating platform.

The ship owners should ensure that the requirements on board for garbage disposal are in accordance with the revised Annex V and the crew is well-informed and trained of the same.

**Procedures for Collecting, Processing, Storage and Discharge of Various Types of Wastes**

Procedures for collecting, processing, storing and discharge of garbage are specified in the revised Annex V. Accordingly, in order to facilitate sorting and recycling, garbage receptacles such as drums, metal bins and cans need to be marked distinctively. For processing, special equipment such as compactors, incinerators, balers and crushers may be used as per the port specifications and space limitations of the vessel. Garbage should be safely stored after appropriate cleaning, disinfecting and pest control treatments. The Annex introduces an “en route” clause that allows discharges only while the ship is en route.

**Treatment of Animal Carcasses**

Ships may be carrying live animal cargo. In the event of any mortality, the carcasses should be removed from the pen areas and appropriate measures should be taken for proper disposal. It should be disposed only beyond the prescribed territorial limits into the oceans or to the port reception facility. In all cases the rules as to occupational health and safety hazards should be complied properly. Mortalities in excess of those generated during the routine operations are not categorized as garbage\(^\text{30}\). In such cases the master of the ship has to get

\(^{30}\) MARPOL 73/78, Annex V
proper advice from the flag state or the coastal state concerned. Fish carried as cargo and that have died on board are also treated as animal carcasses.

**Treatment of Cargo Residues**

Outside the special areas and beyond 12nm from the land, CR that is not harmful to the marine environment may be discharged into the oceans. Cleaning agents in the cargo hold, deck and external surfaces wash water may be discharged into the sea but they should not be harmful to the marine environment. Specifications as to the discharge into the special areas are also specified. The IMO is drafting guidelines for categorizing CR that are harmful to the marine environment. Meanwhile the provisional categorization would apply. Ship owners should specifically classify the bulk cargo in accordance with the guidelines and need to inform the Port State of loading of the cargo on the basis of this classification. The cargo declaration should be in accordance with the provisions of the International Maritime Solid Bulk Cargoes Code, 2011.

After unloading, the CR that remains on the hold and the deck are to be swept and washed of. It is important to avoid contamination of the next cargo and to avoid the risk of pollution. Sweeping down the cargo and washing of the water are part of ship’s garbage management plan. This has to be recorded as Category G in the garbage record book. If the discharge is not permitted en route to the loading port, this water has to be kept in hold tanks and subsequently discharged into the port reception facility. As many ships do not have hold tanks, there can be operational problems.

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31 Herein after to be referred to as the CR
32 MEPC Resolution 219(63), *Supra* n. 27
33 MEPC.1/Circ.791 gives classification provisionally until 31st December 2014
34 *Supra* n.32
35 The International Maritime Solid Bulk Cargoes Code, 2011, s. 4.2, herein after to be referred to as the IMSBC Code, *See* Appendix 1 of the IMSBC Code
36 Herein after to be referred to as the PRF
When packaged cargo or tanked containers are damaged they fall under the category of garbage. Packaged cargo should contain marks, ‘Marine Pollutant’, if they are of that category. The provisions of the International Maritime Dangerous Goods Code, 1965\textsuperscript{37} will be applicable to them\textsuperscript{38}. In the event of an emergency due to human error, bad weather, mishandling or bad stowage, if the cargo is damaged, the provisions of Annex V would apply. In such cases the master should consider the environmental impact and comply with the reporting procedures by the fastest telecommunication channel available to the nearest coastal state or if in ports to the port state. Once the emergency is over, the cargoes that are damaged should be collected, processed and stored and discharged into the PRF in accordance with the provisions of the MARPOL.

The convention empowers port state control officers to “inspect a foreign-flagged vessel, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by garbage”. The enforcement of the provisions is voluntary. “Restrictive and punitive measures, positive incentives and voluntary measures” may be adopted for the enforcement of the provisions\textsuperscript{39}.

**Guidelines for the Disposal of Ship Generated Wastes\textsuperscript{40}**

The guidelines are issued to assist states to implement the provisions of Annex V by means of proper domestic laws. The ship owners have to adopt best practices to ensure that wastes are disposed in accordance with Annex V and domestic laws. Port administrations have to ensure that adequate reception

\textsuperscript{37} Herein after to be referred to as the IMDG Code
\textsuperscript{38} MARPOL 73/78, Annex III
\textsuperscript{39} MARPOL 73/78, Annex V, s.7
\textsuperscript{40} The MEPC.219(63), Supra n.27
facilities are available in ports for proper disposal of ship generated wastes\textsuperscript{41}. The guidelines recommend ships to primarily use port reception facilities than to dispose of ship generated wastes\textsuperscript{42} into the oceans\textsuperscript{43}. It also obligates the governments to provide for adequate port reception facilities.

**Port Facilities for Ship-Generated Waste and Cargo Residues: The European Union Directive\textsuperscript{44}**

The directive aims to reduce ship generated waste in EU ports. The directive is applicable to all member state ports and all types of commercial vessels visiting them. At all EU ports, port reception facilities should be provided to receive ship generated waste without much abnormal delay, suitable to tailor the needs of ships visiting the ports and the size of the port. A waste reception plan should be framed for every port which has to be revised in every three years. Captains or officer in charge of waste management in ships are to give prior notice to the ports regarding the amount of waste that need to be received and also the volume of waste on board the vessel. Ships will not be allowed to leave the community port unless the wastes are received or the vessel has necessary storage capacity. Every community port should maintain a cost recovery system, to encourage the delivery of waste on land and discourage the dumping at sea. The port state control officers are to conduct at least 25% inspections to check whether the regulations are carried out by vessels. In case of any deficiency the next port of call should be alerted. The


\textsuperscript{42} Herein after to be referred to as the SGW

\textsuperscript{43} Supra n.27, Guidelines for the implementation of Annex V of 73/78, Para 1.3

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status of port environment should be audited and the report should be sent to the European Union Parliament and Council.

The EC Directive defines ship generated wastes and cargo residues in accordance with the provisions of MARPOL Annex V and its guidelines. Accordingly, ship generated waste include, “all waste including sewage, and residues other than cargo residues…generated during the service of a ship”45. Cargo residue means, “…remnants of any cargo material on board”46. The enforcement of EC Directive is mandatory.

Regulation of Health and Sanitation Impacts of Waste Disposal

Improper collection, processing, storage and discharge of sewage and garbage into port waters may raise crucial health and sanitation issues to the coastal community. Health and sanitation requirements therefore, form a significant objective behind pollution control. The International Regulation on Health and Sanitation47 enforced by the World Health Organization is yet another important piece of legislation applicable to the safe discharge of ship generated waste and cargo residue in ports48. The Guide is not explicitly mentioned in the current draft of the revised IHR, 2005. Yet, it is a guideline for port regulators, ship operators and ship builders for understanding and assessing the potential health impacts of improper ship designs and operations.

The FAO49 Code of Conduct for Responsible Fisheries

It supplements the requirements and issues addressed by the MARPOL. The FAO Committee on Fisheries, an intergovernmental forum, regularly

45 Id., art. 2( c)
46 Id., art. 22( d)
47 Herein after to be referred to as the IHR
48 The International Health Regulations (IHR) adopted by the World Health Organization (WHO) in 1969
49 Food and Agricultural Organization
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considers marine debris issues associated with fisheries activities. The issue of plastic debris is also considered by the UN Fish Stocks Agreement 2001 and by soft laws like the Voluntary Guidelines for the Marking of Fishing Gear, 1999 and the International Guidelines for by Catch Management and Reduction of Discards, 2011.

Major Limitations of Control of Ship Generated Sewage and Garbage

The international law on safe disposal of ship generated sewage and garbage is in tune with the ‘waste hierarchy’ that is in practice in many developed countries. MARPOL prescribes several methods for treatment of wastes on board. The waste treatment plans on board may depend upon the type and age of vessel, cargo it carries and the commitment of the ship owners. The most appropriate option within the hierarchy was reduction, re use and recycling. It is now replaced by the concept ‘prevention is better than cure’ as a step towards sustainability. The success of this strategy would depend upon the environmental commitment of ship owners and operators and diligences of their crews as these rules are optional.

The Port authorities and their licensees for waste disposal should confirm that adequate port reception facility is available to deal with and accept all forms of recovered and recyclable waste. The ships visiting the ports need to be encouraged to use local facilities for waste disposal to avoid transport by land and additional environmental loading.

The MARPOL offers immense opportunities to control ship based sewage and garbage, as these are pervasive pollution problems even now. The main disability is that its implementation depends upon the member states’ ability to effect an adequate enforcement scheme. The MARPOL Convention obligates parties to adopt all ‘appropriate and practical measures’ to detect violations and assess penalties adequate and severe to discourage
violations but who would enforce it against who remains a critical issue. If reasonable precautions are taken to prevent discharge of garbage or sewage overboard, it would be difficult to prove that it was intentional, unless there are ample provisions in the domestic laws to detect and differentiate it. The Annex convention exempts three forms of discharges from its purview, namely discharge in order to save life at sea, discharge occurring due to damage of the ship or its equipment and the accidental loss of synthetic fishing nets or materials incidentally needed for the repair of such nets. These exemptions are allowed if the master had taken reasonable precautions to avoid the inadvertent escape. But ‘what constitute reasonable precaution’ remains unexplained. This is a major limitation for proper enforcement.

The convention does not make it clear how a port state could require vessels of foreign governments to maintain record books and ship board management plans for waste disposal.

There are also crucial jurisdiction issues connected with the implementation of the Annexes. A port state could exercise jurisdiction only if ‘there are clear grounds of violations’ and when the pollution causes severe damage to its territory and coastal waters. Any information as to its violations should be first given to the concerned flag state. The port state’s primary duty is to monitor discharge violations. The effectiveness of the port state jurisdiction to prosecute would depend on the stringent domestic law having ample solutions to all the above mentioned issues beautifully incorporating discharge restrictions.

Yet another limitation of the Convention is that it exempts military vessels from its purview. It recommends that the state parties shall as far as possible see that these vessels are not acting in contravention of the provisions

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50 MARPOL 73/78, arts. 6(1) & 4(4)
51 Id., Annex V, reg.6
of the convention\textsuperscript{52}. Military and navy vessels are also major contributors of marine debris.

The Annexures obligates parties for providing ‘adequate PRF’s, but, what constitutes ‘adequate facility’ remains unanswered\textsuperscript{53}. Also, the cost involved in setting up PRF may be a major constraint for the port administrations in developing countries.

The convention provides a scheme for disposal of sewage and garbage. But it does not specify a uniform system to implement it. The guidelines to Annex V are recommendatory in nature and do not obligate parties to enforce them at domestic level.

Because of the limitations of international law and other soft laws at regional and multilateral levels, states have difficulty in implementing strong control of sewage and garbage discharges. It would depend on the quality of domestic laws.

**Indian Law on Ship Generated Waste and Cargo Residues**

In spite of the strict regulations under the MARPOL Convention, ships are reported to have been discharging sewage and garbage illegally into the port areas in India. Public interest litigation is pending before the High Court of Kerala seeking a direction to the Cochin Port Trust to take immediate steps to stop dumping of sewage and garbage discharged from the vessels calling at the port in public places. The Petitioner submitted that “…both garbage and toilet waste are taken out of the port by private parties on the basis of licence issued by the port trust. Wastes are dumped in public places and also in the Cochin

\textsuperscript{52} Id., art. 3(3)

\textsuperscript{53} Annex V, reg. 7. The only requirement specified is that the party has to provide PRF at ports “without causing undue delay to ships and in accordance with the needs of ships using them”.

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Port area. Most of the countries do not permit disposal of waste generated from vessels in their territory. But the Cochin port is allowing this”54.

**Controls under the Environmental Protection, Bio-Diversity and Fisheries Conservation Laws**

Control can be exercised over ship generated sewage and garbage under the laws for the protection of environment, bio-diversity and under the fisheries conservation laws. Whether such a scheme of control is necessary in the Indian context and the standards of control under the existing laws are being analysed hereunder.

**The Coastal Regulation Zone Notification 2011**

The discharge of wastes from ships can be regulated under the Coastal Regulation Zone Notification, 201155. The objective behind the CRZ 2011 is

“...to ensure livelihood security to the fisher communities and other local communities, living in the coastal areas ... and to promote development through sustainable manner based on scientific principles taking into account the dangers of natural hazards in the coastal areas, sea level rise due to global warming”56.

The water areas up to 12 nm and the tidal influenced water bodies are included under the CRZ 2011 notification. This includes ports and harbours. Accordingly,

the “...activities in the marine and coastal waters such as dredging, sand mining, discharge of waste from


55 Herein after to be referred to as the CRZ 2011

56 The Coastal Regulation Zone Notification 2011, Preamble
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ships, construction like groynes, breakwaters, etc., including reclamation which have serious impacts on fishing and allied activities” may be regulated\textsuperscript{57}.

But, this cannot be used to deny access or to detain to ships violating the provisions of MARPOL. Under the scheme, the shipping operations can only be regulated, to save the rights of fishing folks.

As such, no enforcement action can be initiated under the CRZ 2011 Notification. Enforcement measures can be initiated only under the Environmental Protection Act 1986, which is deterrent in nature\textsuperscript{58}. The EPA, 1986 states that

“any person who fails to comply or contravenes any of the provisions of the Act, or the rules made or orders or directions issued under the act or rules, then for such failure or contravention, he shall be punishable:-

a) With imprisonment for a term which may extend to 5 years,
b) With fine which may extend to one lakh rupees,
c) With both\textsuperscript{59}.

On the second contravention or failure and thereafter,

“…an additional fine which may extend to five thousand for every day can be imposed for a period during which failure or contravention continues\textsuperscript{60}.

\textsuperscript{57} Id., Cl.(1)
\textsuperscript{58} The Environmental Protection Act, 1986, s.15, herein after to be referred to as the EPA, 1986
\textsuperscript{59} Ibid
\textsuperscript{60} Ibid
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If the failure or contravention continues beyond a period of one year after conviction, the offender is punishable with imprisonment for a term which may extend to seven years”\(^{61}\). Upon the complaint filed by the central or the state pollution control boards, legal proceedings may be initiated against the shipping company, owner and the master as applicable under the Act\(^{62}\).

The inspections and gathering of evidences are very cumbersome under the Act. In normal cases, ships will deposit the bank guarantee and will sail into the next port of call. The law is not well developed like that in the USA to establish the \textit{prima facie} offence committed by the master of the vessel leading to his arrest and detention. The Americans had realized the difficulties and challenges offered by ordinary pollution control laws in punishing willful polluters and violators of the MARPOL. Hence, they have enacted specific legislations such as the Marine Plastic Pollution Research and Control Act, 1987\(^{63}\), which applies Annex V requirements in the United States. It delegates rulemaking authority to the United States Coast Guard. The MPPRCA applies to all foreign and domestic ships, in ports, and terminals in the navigable waters or the EEZ of the United States. The MPPRCA empowers the coast guard to inspect any vessel in the United States territorial waters to verify whether the ship disposed of garbage in violation of the MPPRCA.

The USCG is empowered to impose civil penalties and imprisonment up to 5 years for the violations of MPPRCA. The ship may be denied port entry if it is not complying with the national and international requirements.

The Hazardous Waste Management Act, 1989

The Act prescribes for safe handling of Hazardous Wastes in port waters up to a zone of 5 kilometers and generally controls import and export of

\(^{61}\) \textit{Ibid}

\(^{62}\) The Environmental Protection Act 1986, s.19

\(^{63}\) Here in after to be referred to as the MPPRCA, 33 U.S.C. §§ 1901-1912
hazardous waste in the country. If the cargo handled is of hazardous nature, the provisions of the Act and the Hazardous Wastes (Management and Handling) Rules, 1989 would apply within the 5 Kilometer zone. Shipping operations beyond this zone are covered under the provisions of the Merchant Shipping Act, 1958. The wastes generated under the normal operations of the vessel and cargo residues are categorized as ‘Hazardous wastes’ under schedule I of the Act. Plastic debris is not a listed hazardous substance under applicable regulations, and its hazardous pollutant requirements cannot be enforced against ships discharging plastic debris beyond the specified zone. The Act and the rules under it basically regulate the discharge of toxic and reactive substances but not specifically plastics and other important forms of marine debris discharged from ships.

The Water (Prevention & Control of Pollution) Act, 1974

The Act basically is to regulate discharge of pollutants from land based sources. Yet, when licensees are appointed by the state pollution control boards for disposal of waste from ships the provisions of the Act are applicable. Also, ports being a part of the internal waters and equivalent to land territory, the regulation of shipping operations in ports are to comply with the provision of the Act\(^64\).

The meaning given to “‘trade effluent’ is any liquid, gaseous or solid substance which is discharged from any premises used for carrying on any trade or industry, operation or process, or treatment and disposal system other than domestic sewage”\(^65\).

Under the Act,

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\(^64\) The Act is applicable to 'streams' which include sea or tidal waters as the state government may by official notification specify. Under the CRZ notification 2011, ports include eco-sensitive areas specified under the CRZ Zone I and in all other cases those sea areas coming under the CRZ IV Zone

\(^65\) The Water (Prevention and Control of Pollution) Act, 1974, cl.(k)
“Pollution means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.”

This includes sewage and garbage from ships. Under the Water (Prevention and Control of Pollution) Cess Act, 1977 and the Water (Prevention and Control of Pollution) Rules 1978, the inspections of waste water treatment system and the PRF facilities are to be carried by the pollution control board officer.

**The Wild Life Statutes and Fisheries Conservation Laws**

The Indian Wildlife (Protection) Act, 1972 is applicable in the maritime zones prescribed under the Territorial waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976. Therefore, it covers ports also. Disposal of plastic debris at sea may entangle, kill, or harm a protected resource and violate a wildlife statute by ships. The Indian law on conservation of wild life does not specifically prohibit ships from discharging wastes at sea. The Central Government may regulate the activities so as to protect or conserve marine flora and fauna. The enforcement under such statutes is remote and impossible as the law is not specific on the issue.

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66 Id., cl.(e)

67 The Water (Prevention and Control of Pollution) Cess Rules, 1978, rule.7

68 The Wildlife (Protection) Act, 1972, s. 30A
The Forest Conservation Act, 1980 as amended in 1988; the Biodiversity Act, 2002; fishing regulations and fisheries conservation laws ensure protection of marine biodiversity and fishes. But they are not prohibiting illegal discharge of garbage and sewage from vessels.

The major inadequacy of ordinary pollution control laws, the Biodiversity Act and wild life protection laws are that when regulating sewage and garbage discharges by ships, they impose responsibility on the Government to take steps to preserve marine species. Shipping operations are outside the purview of these laws. Garbage discharges from ships are not specified under any of these laws.

**Control of Ship Generated Wastes and Cargo Residues under the Merchant Shipping Act, 2003**

The Merchant Shipping (Amendment) Act, 2003, prohibits all Indian oil tanker and other ship to which the MARPOL rules apply, when proceeding to sea without International Sewage Pollution Prevention Certificate. The conditions prescribed by the Central Government in this regard are mandatory for such ships.

“Sewage” is defined as,

“...drainage and other waste from any form of toilets, urinals and water closet scuppers; drainage from medical premises (dispensary, sick bay and other like places) via wash basins, wash tubs and scuppers located in such premises; drainage from spaces containing...”

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69 The MPRCA § 2104, 33 U.S.C. § 1907(d)(1)

70 Ships of 400 Gross tonnage or above and carrying 15 or more passengers come under this rule.

71 The Merchant Shipping (Amendment) Act, 2003, s.356 C

72 *Id.*, cl.3
The central government can prescribe design specifications for all oil tankers and other Indian ships to prevent the discharge of harmful substances into the ports. Accordingly, all Indian ships should have the sewage treatment plan and certification as prescribed under the convention. The definition of sewage is the same as in MARPOL.

“Harmful substance” is defined as

“…any substance which, if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life, damage amenities or interfere with other legitimate uses of the sea, and includes any substance subject to control by the Convention.”

This definition incorporates the definition for harmful substances mentioned in the convention like the marine debris, other forms of garbage and sewage. Even discharges due to wrecks or grounding and stranding of vessels that may cause obstruction to navigation and other legitimate uses of the sea such as fishing and recreation are harmful substances under this definition. When compared to the list of harmful substances under MARPOL, this definition is broader in scope. The legislation empowers the central government with much extended enforcement powers not only to control pollution but also to ensure the safety, sanitation and health of the people. It facilitates the legitimate use of ports.

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73 Id., s.356 C explanation
74 Id., s. 356 E
75 Ibid, s. 356 E explanation
Under the Act, the sewage and garbage record books are to be maintained. Entries are to be made. The custody, disposal and all other matters pertaining to such records on board should be done as per the provisions of the convention.

**Inspection and Control**

The duty to inspect on the compliance of prohibitions, restrictions and obligations imposed by the Merchant shipping Act to control disposal of ship generated wastes and cargo residues is vested with the Surveyors of the Mercantile Marine Department. They should physically inspect the vessel to find out whether there are any contraventions of the discharge and design specifications; steps taken to prevent and control pollution; maintenance of record books on board and validity of the ISPP. They can report their finding to the D. G. Shipping for enforcement measures. Based upon these evidences, the D. G. Shipping can take enforcement measures against the defaulting vessels. The ship may be detained or fine may be imposed. The navy or coast guard can be asked to stop the vessel from proceeding further. The concerned flag state may be asked to initiate legal proceeding against the master and owners of the defaulting vessel.

**Port Reception Facilities**

The Port Authority is required to provide Port Reception Facilities. Charges can be collected for it. Conditions can be prescribed for using it. If adequate facilities are not available the central government may have discussions with the concerned port authority and direct them to provide for the

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76 *Id.*, s. 356 F
77 Inspections can be done by a person authorized under section 356 G (1). The Merchant Shipping Act, 1958, s.9
78 The Merchant Shipping Act, 1958, s.356 F, Cls. (1)(a)- (e) and (2)
79 *Id.*, s. 356 H
80 *Id.*, s. 356 I
same in accordance with the provisions of the convention. The Central government shall by notification in the Official Gazette specify about the port reception facilities available in India.\(^{81}\)

**Power to Make Rules for Regulating Discharge of Garbage**

The Central government is empowered to make rules to implement the provisions for prevention of pollution by ship generated waste and cargo residues.\(^{82}\) Accordingly, rules can be prescribed to limit the discharge of harmful substances; the issuance of various pollution prevention certificates and to prescribe the duration of surveys and design specifications for vessels for the proper implementation of the Convention.

**The Merchant Shipping (Prevention of Pollution by Sewage from Ships) Rules, 2010**

In India, the compliance with the provisions of discharge of garbage under MARPOL, 73/78 has become mandatory for all ships since 27th September, 2008.\(^{83}\) The Draft Rules under the Merchant Shipping Act for the Prevention of Pollution by sewage from ships has entered into force on 7th January 2010 following the publication in the Official Gazette.\(^{84}\)

The rules are applicable to new ships above 400 gross tons. Ships that are able to carry more than 15 passengers also come under the rules. The rules are applicable to ships existing since five years after 27th September 2003, which are of 400 gross tons or more and could carry 15 or more passengers.\(^{85}\)

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\(^{81}\) *Ibid*

\(^{82}\) The Merchant Shipping Act, 1958, s.356 O

\(^{83}\) The Director General of Shipping, Engineering Circular No. 95/2008, dated 10th October 2008, NO: ENG/OPP-38(2)/Annex-IV/Part-I/2008 on MARPOL Annex IV implementation

\(^{84}\) The Merchant Shipping (Prevention of Pollution by Sewage from Ships) Rules, 2010, G.S.R 13E, dated 7th January 2010

\(^{85}\) *Id.*, r. 3
Existing ships of the above said description are obligated to ensure prevention of pollution by sewage. The rules are not be applicable in cases where the discharge is for ensuring the safety of the ship and those on board; or for saving of life at sea. It is also not applicable where the discharge of sewage happens from damage to the ship or its equipment provided all reasonable care has been given to prevent such escape.

Hence, no ship can conduct trade within the internal waters of India except according to the specifications mentioned under the rule.

**Survey and Monitoring Requirements**

The rules prescribe for initial, renewal, intermediate, annual and additional surveys. Under Rule 4, after the initial survey, on satisfactory compliance of all the technical requirements, the ship can be issued an ‘International Sewage Pollution Prevention Certificate’. The renewal survey has to be done in every five years. Whenever any structural changes are carried out additional survey has to be conducted to ensure the design and discharge equipment specifications.\(^{86}\) It is the duty of the owner and master of the ship to ensure the reporting the need for surveys immediately after any changes is made in the ship design or construction. If after the survey, any deficiencies are found out by the surveyor, the same should be reported to the D.G. Shipping and the concerned port state, if the ship is in the port. The Central Government, through the D.G. Shipping should ensure the correctness of the survey conducted. The port states upon the request from the surveyor should take all steps to detain the vessel and require it to comply with the specifications under the rule so that without reasonable delay it is allowed to sail into the next port of call without offering any threat to the marine environment.

This system would work properly only if it is well co-ordinated by the office of the D.G. Shipping. There should be effective port state control and

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\(^{86}\) *Supra* n.69
ship owners should be committed to submit to the rules. If the ship is not in the port state at the time of renewal of the certificate, it may be given up to three months’ time to reach the port. Thus, the survey requirements are ensured under the Act. But the implementation would require effective coordinations of various departments.

**Design Specification on Board**

Every ship specified under the Merchant shipping rules\(^{87}\) is required to equip with one of the specified sewage treatment systems. This system should be a sewage treatment plant as per the specifications of the IMO; a sewage comminuting or disinfecting system or a holding tank. Either of the first two specifications is mandatory within the 3 nm zone including the ports and in accordance with the specifications of the D.G. Shipping in India. Standard discharge connections are specified under the rules\(^{88}\).

**Discharge Specifications**

If the sewage is not comminuted or disinfected, the discharge shall be beyond, twelve nautical miles that is beyond the territorial sea limit. If comminuted or disinfected, it may be discharged beyond three nautical miles\(^{89}\) and in both cases it should be discharged at moderate rate and not instantaneously. In all other cases, sewage shall be stored on board in separate holding tanks and may be emptied only into the reception facilities available on shore or en route into the high seas\(^{90}\). During any survey of these operational requirements, if the surveyor notices that the master or the crew is not aware of the operational requirements on

\(^{87}\) *Id.*, r. 3, op. cit. 84

\(^{88}\) *Id.*, r. 10

\(^{89}\) *Id.*, r. 11

\(^{90}\) *Id.*, r. 12
board; legal proceedings can be initiated against them. A fine of thousand rupees can be imposed for any violations of this rule.

**The M.S (Prevention of Pollution by Garbage from Ships) Rules, 2009**

Garbage is defined as,

“all kinds of victual, domestic and operational wastes, excluding fresh fish and parts thereof, generated during normal operations of ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexures to” MARPOL.

The rule imparts general obligation on all ships to comply with its provisions. Subject to same exception, “disposal into the sea of all plastics, including synthetic ropes, synthetic fishing nets, plastic garbage bags, incinerator ashes from plastic products which may contain heavy metals and toxic residues shall be prohibited.” No discharge into the sea is permissible within three nautical miles, which includes the ports. Dunnage, lining and packing materials that float shall not be released into sea areas less than 25 nautical miles from the nearest land. Garbage including paper products, rags, glass, metals, bottles, crockery and food wastes may not be released unless it is passed through a comminuter or grinder and should not be disposed within the 12 nautical miles zone from the nearest land.

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91 The Merchant Shipping Act 1958, s. 356 H
92 The Merchant Shipping Act 1958, s.458
93 The M.S (Prevention of Pollution by Garbage from Ships) Rules 2009, r.1( e)
94 *Id.*, r. 4,5 and 6
95 *Id.*, r.3
96 *Id.*, Cl. II
97 Ibid
These provisions are not applicable when the discharge of garbage occurs to ensure safety at sea, of cargo, to protect life, escape due to damage of the ship or its equipment and any accidental discharge even after taking reasonable care to prevent it.\footnote{Id., r. 6}

**Port Reception Facility**

The Central government shall provide with reception facilities at ports for receiving residues of garbage from ships.\footnote{Id., r. 7} If there is any inadequacy of port reception facility the ports, the matter can be intimated to the IMO.

**Port State Control**

The rule provides for port state control inspections\footnote{The Merchant Shipping Act, 1958, s.356G} and empowers D.G. Shipping with the powers to detain the ship in case of wilful violations and to initiate legal proceeding against the owner, master and crew of the vessel in case if the operational requirements are not known to them.\footnote{Id., r. 8. Also See, Supra n. 78}

**Garbage Management Plan and Garbage Record Book**

The Merchant Shipping (Prevention of Pollution by Garbage from Ships) Rules, 2009 mandates keeping on board a ‘garbage record book’ which should be properly maintained with appropriate entries on time about every discharge operation. It is required that every ship of 400 gross tons or more and every ship capable of carrying 15 passengers on board should have a garbage management plan which should contain details on storing, processing and discharge of garbage. The plan should be in accordance with the guidelines of the IMO. Every ship twelve metre or more in length should clearly inform the crew and passengers about disposal requirements under the rules.\footnote{Id., r. 3 & 5}
procedures by means of placards. A fine of 1000 rupees may be imposed for violations of the rules. Additional fine of 50 rupees per day can be levied if the offence is continuing in nature.

**Major Ports (Prevention and Control of Pollution) Rules, 1991**

The vessel should not discharge, throw, place, empty, allow to leak or flow within the limits of a major port any pollutant. Pollutant is defined as, “...sewage, garbage, earth, ashes, stones, rubbish, waste material, refuse, chemicals or any other harmful or noxious substance if it affects the nature, colour, smell or transparency of the water or if it forms visible floating fractions on water.”

‘Garbage’ according to the rule means

“all kinds of victual domestic and operational waste; generated during the normal operation of a ship and liable to be disposed of continuously or periodically except these substances which are defined or listed in Annexures I to IV to the IMO Convention.”

Thus, oil, noxious liquid substances, harmful substances in the packaged form and sewage as mentioned under the MARPOL does not fall under the definition of garbage under the rules.

**Disposal of Garbage**

If ship board incinerator is not present, the master of the vessel should ensure that all garbages are disposed into the shore reception facility alone.

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103 Id., r. 9
104 Id., r. 3
105 Id., r. 1 (k)
106 Id., r. 1(d)
incinerator is there, he should assure that garbage do not accumulate or lay scattered on board\textsuperscript{107}. Twenty four hours’ notice should be given to the port authority if the vessel needs reception facility on shores\textsuperscript{108}.

**Precautions in Ports to be followed by the Master**

It is the duty of the master to ensure, before cargo operations are carried out that all sea valves are properly closed, connecting valves are well maintained, safety checklists mentioned under the international safety code are maintained and the procedures mentioned under the pollution checklist has been complied with. The onus of proof is on the master to prove that any escape of pollutant was irrespective of reasonable care taken to avoid loss. In case the master notices any spill of contaminated water from the vessel, the same should be reported to the port authority\textsuperscript{109}. He should make available all record books mentioned under the MARPOL for inspection and should assist in survey and inspections\textsuperscript{110}.

**Assessment of Port Reception Facilities**

The assessment of port reception facilities are to be done based upon the number and types of ships visiting the particular port, the requirements of ships and according to the size and location of the port\textsuperscript{111}.

The government when assessing the adequacy of reception facilities should consider the infrastructural limitations for recycling of wastes and the constraints as to the choice of treatment and disposal of garbage received from

\textsuperscript{107} Id., r. 23  
\textsuperscript{108} Id., r. 11  
\textsuperscript{109} Id., r. 19  
\textsuperscript{110} Id., r. 21 and 22  
\textsuperscript{111} MARPOL 73/78, Guidelines to Annex V
ships. In the national programme of waste management schemes the relevant international requirements and standards should be incorporated.\textsuperscript{112}

The international guidelines require close interactions between the government, port authority and the local authority in adopting the best practice for ship generated waste and cargo residue disposal, the port-by-port listing of available reception facilities and the type of wastes they are equipped to handle in accordance with their capacity and any special procedures for their disposal. This information has to be submitted to the Global Integrated Shipping Information System of the IMO. Without the compliance of these requirements, ports may not be able to do trade in future. Governments are encouraged to develop policies and practices that facilitate the reduction, use and recycling of ship-generated garbage and the adoption of modern waste reception facilities.

In India, the normal practice is to entrust this assessment task to private consultancies. Based upon their report, the waste management plan will be prepared for the port. Many ports are just into the process of preparation of these plans.\textsuperscript{113} Many are yet to implement this important international requirement.

**Working of the Waste Management Plan in Ports\textsuperscript{114}**

The system to facilitate collection and disposal of wastes is carried out through licensed contractors duly authorized by port authorities. The Port publishes tender documents that normally set the pre-qualification criteria requiring valid registration certificates to be possessed by the bidders from the Central Pollution Control Board or the State Pollution Control Board. In

\textsuperscript{112} Id


\textsuperscript{114} Based on the Waste Management Plan of Jawaharlal Nehru Port Trust, Murmugo, Chennai and Mumbai Ports, available at their respective websites.
addition to this, the licensees must possess the certificate of consent to operate such plants\(^\text{115}\). They should also have the requisite authorization under the Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008 from the State Pollution Control Board. These licensees should also take certificates from various other agencies\(^\text{116}\). A bidder possessing all these certificates need not qualify the tender as it is the duty and responsibility of the port authority to decide upon the agency to be licensed to dispose of the wastes from ships\(^\text{117}\). There are also chances that the licensee appointed need not be well trained and equipped to handle the waste disposal as per the international requirements\(^\text{118}\).

A vessel that requires the disposal of sewage or garbage contacts its agent, who in turn will submit the request to the port authorities.

The requirement of the sewage reception facility is usually provided through road tankers belonging to the contractor which can off load the sewage in the sewage treatment plant at township or any other designated and recommended plant.

These facilities are charged by port authority. The garbage is disposed at designated place provided by port planning & development department outside

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\(^{115}\) The Water (Prevention and Control of Pollution) Act, 1974, s. 25 & 26, the Air (Prevention and Control of Pollution) Act, 1981, s.21. The State Pollution Control Board is the issuing authority

\(^{116}\) Industrial Registration Certificate, Import & Export Certificate, Central Excise Registration Certificate, Central sales certificate, Explosive Licence and approval of the Customs Department

\(^{117}\) The Merchant Shipping Act, 1958, s.356 I

\(^{118}\) Nuruzzaman Khan and Others v. The Union Of India, W.P. 29805 (W) of 2013, decided on 1\(^{\text{st}}\) October 2013 by the Kolkata High Court, reported in India Kanoon, See, http://www.indiankanoon.org/doc/85797734/, last accessed in December 2013
the Port area. As of now, very few ports are having a solid waste management facility for treatment of garbage waste within the port area.

The port’s emergency action plan will be followed in case of any emergency arising out of the handling of wastes. The emergency action plan contains procedures for mitigating the impacts of accidental spills, leakages of noxious substances, fire or explosion.

The waste management plan is subjected to periodic audit and review in every two years. The guidelines in this regard are issued by the D.G. Shipping. The overall co-ordination of the waste management plan is done by the deputy conservator. He should ensure that all vessels entering the ports are made aware of the waste reception facilities available at each berth.

Conclusions

Reducing the discharges of sewage and garbage into the oceans will certainly facilitate protection of marine environment. This can be achieved by implementing the objectives set out in MARPOL 73/78, by reducing on board ship generated waste, improving the availability of port reception facilities and the enforcement regime. The introduction of MARPOL annexures has reduced the entanglements and ingestions to marine biota in some places, but at some other locations the situations remain the same or without much improvement\textsuperscript{119}. The MARPOL implementation to a great extent depends upon the ship owner’s willingness to stick on to the provisions of the annexures and the regulations of the ISM Code. The reduction of pollution may also depend upon the waste management plans and standards set by the home port, port of call and requirements and plans to be carried out on board.

In India, ships continue to discharge vast amount of plastics and sewage illegally into the oceans and this shows gross neglect of the provisions of MARPOL. If economic costs involved with the compliance are exorbitant, companies may practice illegal discharging into the sea. Unfortunately, waters of developing countries like India are highly susceptible to this non-compliance and illegal discharging of ship generated wastes because of the lack of proper laws and poor enforcement regime. The domestic law should clearly address the legal, financial and practical responsibilities of all concerned in the operation of delivery and disposal of ship generated waste in ports.

Therefore, port waste management forms an important agenda for port administrations. The ship generated waste and cargo residues need to be regulated properly. “Reduce, re-use and recycle” should be an important principle of port waste management.

Waste fee should be charged on all vessels visiting the ports, irrespective of the fact whether they use it or not. This should be included in the port taxes. The cost recovery system will definitely encourage the disposal of waste on land rather than its illegal dumping at sea.

Along with strict punitive or negative incentives, government may also consider giving positive incentives to those who comply with the requirements. These incentives can be tax incentives, loan guarantees or government subsidies.

In order to minimize the burden of providing for port reception facilities for wastes, ship board management plan should be encouraged. The flag states should provide incentives to ship owners to purchase and install equipment such as incinerators on board. The government should encourage research and development of technology for the compliance with MARPOL for ships and ports.

When amending the domestic legislation, voluntary practices adopted by the shipping industry to comply with MARPOL can also be considered.
In India, private contractors collect wastes from ship and this system does not encourage the delivery of waste on land. A change is worth consideration. Port administrations need to do a lot on proper management of waste received from ships.