

Marine Pollution: Awareness and Strategy Build up is Crucial for Combating Threats Springing at Shipping Sector

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A seafarer may easily locate the root causes, if he desires so and knows the consequent impact of pollution at sea than any other professional. But every other profession in general and maritime stakeholders in particular need to perceive the importance of marine pollution as it continually affects the whole of humanity. Pollution of the oceans by carbon dioxide, oil spills, plastics, toxic metals, manufactured chemicals, pesticides, sewage, and agricultural runoff is killing and contaminating marine life and fish in particular. Fishes are major protein sources for almost 38% of the global population. Out of over 300 million tons of plastic produced yearly for use in a wide variety of applications, nearly 5% of plastics end up in the ocean every year. Plastic pollution threatens food safety, marine species, and human life. Again, increasing carbon dioxide levels are raising sea temperatures and resulting in ocean acidification.

International Maritime Organization (IMO) is the principal body for regulating all activities at sea by forming relevant

rules and conventions. Unless our policymakers and cohorts are fully aware of all maritime world activities, keeping the oceans safer for living creatures on earth would be challenging.

Worldwide marine scientists and specialists are regularly conducting research on this important maritime science sector and recording huge amounts of data for the good governance of oceanic activities. Keeping information and new data only for record-keeping or awareness-building is not enough at all unless these are used for building new strategies for pollution control in the maritime shipping sector.

In 1973, IMO adopted the International Convention for the Prevention of Pollution from Ships, now known universally as MARPOL, with relevant amendments. MARPOL has dramatically contributed to a significant decrease in pollution from international shipping and applies to 99% of the world's merchant tonnage. Almost 60% of humanity lives on or within 100 km of a sea coast (Hinrichsen, D). Major

impacts which all stakeholders need to be aware of are the following:

- Greenhouse gas released from shipping and ports can add to global warming.
- Air pollution from ships can harm the marine environment and human health.
- Pollution actions, like oil spills, can have intense effects on life.
- Research shows that underwater noise – caused by ships moving through the sea – contributes to hearing damage, raised stress levels, and behavioural changes in marine animals.
- Untreated ballast water, necessary for the safe operation of ships, plays a part in introducing species from one marine environment into another, thus threatening indigenous marine life.

MARPOL contains six technical Annexes. Particular areas with strict controls on operational discharges are included in most Annexes, and ship operators and owners must have explicit knowledge about the following annexes:

- a. **Annex I.** Regulations for the Prevention of Pollution by Oil (entered into force on 2 October 1983) covers the prevention of pollution by oil from operational measures as well as from accidental discharges (provision of the double bottom hull); the 1992 amendments to Annex I, which was subsequently revised in 2001 and 2003.
- b. **Annex II.** Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force on 2 October 1983). It entails the discharge criteria and measures for the control of

pollution by noxious liquid substances carried in bulk. No discharge of residues containing noxious substances is permitted within 12 miles of the nearest land.

- c. **Annex III.** Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force on 1 July 1992) contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions, and notifications.
- d. **Annex IV.** Prevention of Pollution by Sewage from Ships (entered into force on 27 September 2003) contains requirements to control pollution of the sea by sewage with some binding clauses and mentions that sewage which is not disinfected has to be discharged at a distance of more than 12 nautical miles from the nearest land.
- e. **Annex V.** Prevention of Pollution by Garbage from Ships (entered into force on 31 December 1988) deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of; the most important feature of the Annex is the complete ban imposed on the disposal into the sea of all forms of plastics.
- f. **Annex VI.** Prevention of 'Air Pollution from Ships' (entered into force on 19 May 2005) sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone-depleting substances.

The Energy Efficiency Design Index (EEDI) was made mandatory in July 2011

for new ships and the Ship Energy Efficiency Management Plan (SEEMP) for all ships at MEPC 62 with the adoption of amendments to MARPOL Annex VI, resolution MEPC.203(62).

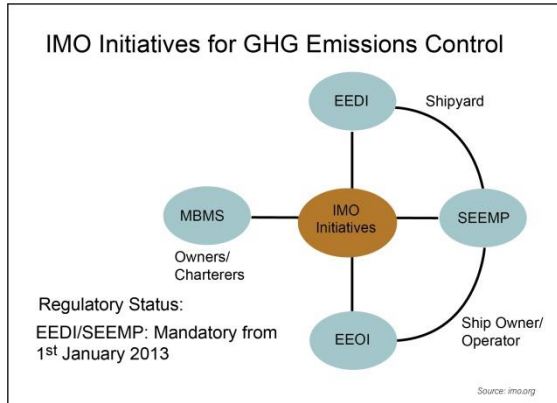


Figure 1: EEDI/SEEMP Model

EEDI reflects the amount of CO₂ generated per tonne-mile (cargo carrying capacity). It constitutes a uniform approach to calculating a ship's energy efficiency during the design and building of new ships and will be used to control CO₂ levels by improving the ship's design. [EEDI=Actual CO₂ Emission/ Transport Work]. Here objective is to change ship/machinery design to reduce GHG emissions. There are several ways to achieve this, such as:

- Increase ship size to engine power ratio
- Reduce lightship weight
- Innovative solutions (air bubble – friction reduction)
- Optimize propeller efficiency
- Hydrodynamics improvement
- Speed reduction
- Use of renewable power sources (wind, solar power)
- Low-carbon fuels (e.g., LNG)
- Energy saving devices (e.g., WHR, shaft generators)

As per revised MARPOL Annex VI for preventing air pollution from ships, Sulphur limit has been reduced to 0.50% from 3.5% (since January 2020). This can be complied with either by compliant fuel

or installing an exhaust gas cleaning system with exorbitant prices. In order to manage ships' ballast water and sediment either by exchange method or by approved ballast water treatment system, Ballast Water Management (BWM) convention was adopted in 2004. In 2017, resolution 1088(28) was adopted to maintain the BWM plan, and it states ships must have an international BWM Certificate. Recently there has been a remarkable increase in shipping activities in Polar Regions, and as such new rules have been integrated mandatory 'Polar Code', particularly for vessels built after 2017.

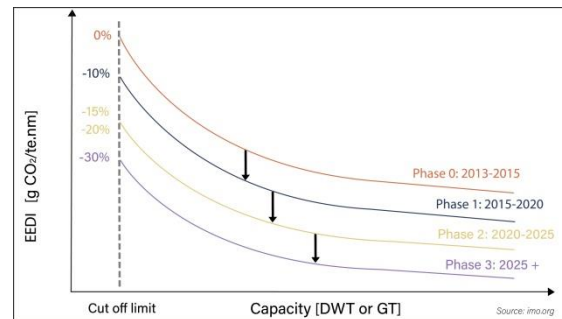


Figure 2: Reduction Factors and Cut off limits

The IMO craving levels cannot be reached only by energy efficiency improvement. Therefore, researchers are regularly going on to find alternative fuels, electrical drives (also Hybrid): chemically stored electricity (batteries), solar panels and fuel cells (hydrogen); different propulsion engine units (nuclear), additional propulsion aids (sails, flattener rotor). Mere awareness building to reduce /control pollution levels in the marine environment is not enough to meet the desired goals. An appropriate strategy needs to be adopted to combat the threats due to pollution in the national, regional, and international arenas. The state of awareness in the EU differs entirely from that in the Asia Pacific Region. European Maritime Safety Agency (EMSA) has been playing a dominant role in formulating their strategies for effective implementation of the conventions.

Unfortunately, such initiatives are absent in the Indian Ocean regions. The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is an appropriate regional organization that may be a leading organization for controlling all types of pollution. The BIMSTEC member countries can address this problem both individually and collectively. Unfortunately, the Maritime Safety Administration in Bangladesh is not properly functional. Cases of accidents say fuel spillages are not properly investigated, and reports are not as open to the public as those in Japanese National Safety Agency cases. The Japanese safety authority reflects all types of accidents (land, air, and sea) through a common platform, which is a good example for every other similar authority across the world.

In Bangladesh, the shipping market is getting more popular and more prominent day by day. There are new incentives of the present government through the reduction of VAT and Tax matters to investors earning foreign currency. As a result, there has been a considerable rise in the number of Bangladesh flag vessels at sea.

On the other side, the shipbreaking industry is already a matured industry, and it has also brought new threats due to

pollution simultaneously. People associated with this business need to be much more cautious about safety matters, as the risk of pollution in coastal areas is rambling. The majority of the institutions in the shipping sector need to be more proactive in converting the huge number of available human resources to more useable capital with higher levels of skills to achieve international standards. Again, the role of owners in private industries is very important, and they need to be acquainted with the available conventions and critical safety rules so that the grading of vessels never goes down and strengthens their competitive advantages over their counterparts. Management bodies, which are prudent and skillful with knowledgeable employees on the threats and consequences of pollution, should control safer working platforms in all operational areas. Responsible leaders at the management level need to reinforce their regulatory mechanism so that strict compliance is made possible both at home and foreign ports by Bangladesh Flag carriers.

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