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**IMO Technical and Operational Measures for
Reduction of Emissions of Greenhouse Gas from
Ships: Perspectives of Asian Countries**

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IMO Technical and Operational Measures for Reduction of Emissions of Greenhouse Gas from Ships: Perspectives of Asian Countries

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Abstract

International shipping is responsible for about 2.7% of the global emissions of CO₂. In the absence of proper action, emissions from the maritime sector may grow by 150% to 250% by 2050, in comparison with the level of emissions in 2007. Against this backdrop, the International Maritime Organisation has introduced a mandatory Energy Efficiency Design Index (EEDI) for new ships and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. Some Asian countries have voiced serious reservations about the newly adopted IMO regulations. They have suggested that imposing the same obligations on all countries, irrespective of their economic status, is a serious departure from the Principle of Common but Differentiated Responsibility, which has always been the cornerstone of international climate change law discourse. Against this backdrop, this article presents a brief overview of the technical and operational measures from the perspective of Asian countries.

1. Introduction

According to a study conducted by the International Maritime Organization (IMO), the maritime sector is responsible for nearly 3.3% of the global emissions during 2007. International shipping is responsible for about 2.7% of the global emissions of CO₂ in 2007.¹ In the absence of proper actions, emissions from the maritime sector may grow by 150% to 250% by 2050, in comparison with the emissions in 2007.² Growth in the maritime sector is primarily responsible for this.³ This warrants proactive action to achieve a greener shipping industry.

The 1997 Kyoto Protocol of the United Nations Framework Convention on Climate Change (Kyoto Protocol) calls upon states to pursue limitation or reduction of emissions of GHG from marine bunker fuels working through the IMO.⁴ In December 2003, the IMO Assembly adopted the resolution A.963(23) on IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships, which urged the Marine Environment Protection Committee (MEPC) of the IMO to identify and develop the mechanisms needed to achieve the limitation or reduction of GHG emissions from international shipping: technical, operational and market-based solutions. Since then a negotiation has been going on within the MEPC for adoption of necessary legal instruments. In 2011, 14 years after the adoption of the Kyoto Protocol, the MEPC has adopted mandatory energy efficiency measures for international shipping. The MEPC's measures can be treated as the first ever mandatory

¹ IMO, *Second IMO GHG Study Summary*, IMO Doc. MEPC 59/4/7 (9 April 2009).

² *Ibid.*

³ *Ibid.*

⁴ *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, opened for signature 11 December 1997, 2303 UNTS 148 (entered into force 16 February 2005); *United Nations Framework Convention on Climate Change*, opened for signature 4 June 1992, 1771 UNTS 164 (entered into force 21 March 1994) [UNFCCC].

global GHG reduction instrument for an international industry. The MEPC approved an amendment to Annex VI of the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).⁵ This amendment added a new Chapter 4 to Annex VI of the MARPOL Convention introducing a mandatory Energy Efficiency Design Index (EEDI) for new ships and the Ship Energy Efficiency Management Plan (SEEMP) for all ships.⁶ A survey and certification system, which includes an International Energy Efficiency Certificate, has also been introduced through this amendment.⁷ These regulations entered into force on 1 January 2013. Despite serious opposition from a few Asian countries, including China and India, the state parties to the MARPOL Convention have decided that this legal instrument will be equally applicable for vessels of all countries.

Considering the growth projections of human population and world trade, the technical and operational measures may not be enough to reduce the amount of GHG emissions from international shipping to a satisfactory level. Therefore, the IMO is considering introducing market-based mechanisms that may serve two purposes: providing a fiscal incentive for the maritime industry to invest in a more energy efficient manner; and offsetting growing ship emissions.⁸ A negotiation is going on for the adoption of market-based measures to supplement previous technical and operational measures.

Some Asian countries that participate regularly in the negotiation process voiced their serious reservations on the newly adopted IMO regulations. They stated that by imposing the same obligations on all countries, irrespective of their economic status, this amendment has seriously departed from the Principle of Common but Differentiated Responsibility, which has always been the cornerstone of international climate change law discourse. They also claimed that negotiation for a market-based mechanism should not be continued without a clear commitment from the developed countries to promote technical co-operation and to transfer technology relating to the improvement of energy efficiency of ships. Against this backdrop, this article presents a brief overview of already adopted technical and operational measures from the perspective of Asian countries. This article will not discuss proposed market-based measures. The discussion will be confined to the operational and technical measures.

2. Technical and Operational Measures for Reduction of Emissions of GHG from Ships

IMO started considering the reduction of GHG emissions in the late 1980s. In 1997 the organization conducted the first IMO Study on GHG emissions from ships. The report identified a potential for reduction of GHG emissions through the introduction of operational and technical measures. In 2003, the IMO Assembly adopted resolution A.963(23) on IMO Policies and Practices Related to the Reduction of GHG Emissions from Ships. In 2009, IMO conducted another GHG Study. The IMO GHG Study 2009 concluded that the emissions

⁵ *International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)*, opened for signature 17 February 1978, 1340 UNTS 61 (entered into force 2 October 1983) [MARPOL 73/78].

⁶ See IMO, “Mandatory energy efficiency measures for international shipping adopted at IMO environment meeting”, online: <<http://www.imo.org/MediaCentre/PressBriefings/Pages/42-mepc-ghg.aspx>> (accessed 5 September 2013).

⁷ *Ibid.*

⁸ See IMO, “Greenhouse Gas Emissions”, online: <<http://www.imo.org/ourwork/environment/pollutionprevention/airpollution/pages/ghg-emissions.aspx>> (accessed 5 September 2013).

from international shipping can be reduced up to 25% to 75% by using energy efficient design and operational practices.⁹

In July 2009, after considering the second IMO GHG Study, the MEPC approved a number of voluntary measures including Interim Guidelines on the Method of Calculation of the Energy Efficiency Design Index for New Ships (EEDI), the Interim Guidelines for Voluntary Verification of Energy Efficiency Design Index, the Guidance for the Development of a Ship Energy Efficiency Management Plan (SEEMP) and the Guidelines for Voluntary use of the Energy Efficiency Operational Indicator (EEOI). In July 2011, the MEPC adopted draft amendment to MARPOL Annex VI and included legally binding regulations on energy efficiency for ships (the “Energy Efficiency Regulations”). These amendments to MARPOL Annex VI entered into force on 1 January 2013 through a tacit acceptance procedure. They introduced a mandatory EEDI for new ships and the SEEMP for all ships.

Technical and operational measures have been introduced to improve energy efficiency of ships. This is achieved by improvements in a ship’s equipment and improvements and innovation in the operation of ships.¹⁰ As mentioned earlier, IMO introduced a mandatory EEDI for new ships and the SEEMP for all ships. The EEDI relates to technical measures for reduction of GHG emissions from ships and the SEEMP relates to operational measures for reduction of GHG emissions from ships. The EEDI introduces a non-prescriptive and performance-based mechanism. It allows the ship-owner to choose suitable or most cost-effective technologies as long as the required energy efficiency level is attained.¹¹ Unlike previous IMO regulations it did not prescribe particular equipment.

2.1 SEMP

SEMP introduces a mechanism for improvement of the operational energy efficiency of ships. It encourages not only a ship-specific SEEMP but also a border corporate energy management policy for shipping companies. Each ship shall keep on board a ship SEEMP that may be part of the ship’s Safety Management System (SMS).

The SEEMP shall be developed taking into account guidelines adopted by IMO. Accordingly, the MEPC has adopted guidelines, which are now required by the amended MARPOL Convention, for ships to assist with the preparation of SEEMP.¹² According to these guidelines, “[a] SEEMP provides a possible approach for monitoring ship and fleet efficiency performance over time and some options to be considered when seeking to optimize the performance of the ship.”¹³ The 2012 Guidelines stipulate that the “SEEMP seeks to improve a ship’s energy efficiency through four steps: planning, implementation, monitoring, and self-evaluation and improvement.”¹⁴ The planning stage will determine the current status of ship

⁹ IMO, *supra* note 1.

¹⁰ Fai Cheng, “IMO Technical Measures in Reducing Greenhouse Gas Emissions from Ships: A Lloyd’s Register Perspective”, online: <http://www.ecmar.eu/media/3697/lr_ecmar_eedi_article_final.pdf> (accessed 6 September 2013).

¹¹ Edmund Hughes, “A new chapter for MARPOL Annex VI – requirements for technical and operational measures to improve the energy efficiency of international shipping” (February 2013), online: <<http://www.imo.org/KnowledgeCentre/PapersAndArticlesByIMOStaff/Documents/A%20new%20chapter%20for%20MARPOL%20Annex%20VI%20-%20E%20Hughes.pdf>> (accessed 6 September 2013).

¹² 2012 *Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP)*, MEPC Res 213(63), Annex 9, IMO Doc MEPC 63/23 (2 March 2012) [2012 Guidelines].

¹³ *Ibid.*

¹⁴ *Ibid.*

energy usage as well as the mechanism for improvement of ship energy efficiency.¹⁵ This stage involves ship-specific measures, company-specific measures, human resource development and goal setting.¹⁶ However, "... the goal setting is voluntary, that there is no need to announce the goal or the result to the public, and that neither a company nor a ship are subject to external inspection."¹⁷ After the planning and identifying operational measures they have to establish a proper implementing mechanism for "selected measures by developing the procedures for energy management, by defining tasks and by assigning them to qualified personnel." According to the 2012 Guidelines, "the SEEMP should describe how each measure should be implemented and who the responsible person(s) is. The implementation period (start and end dates) of each selected measure should be indicated. The development of such a system can be considered as a part of planning, and therefore may be completed at the planning stage."¹⁸ The guidelines also encourage record-keeping of the implementation of each measure and of identified measures that cannot be implemented for any reason(s).¹⁹ They also suggest the quantitative monitoring of the energy efficiency of a ship through an established method, preferably using an international standard²⁰, and envision that a periodic self-evaluation system should be implemented by using data collected through monitoring.²¹

The 2012 Guidelines identify a number of efficiency measures and suggest that all parties involved should consider the inclusion of these measures in their operations. These efficiency measures include fuel-efficient operations measures such as improved voyage planning, weather routing, just in time, speed optimization, optimized shaft power, as well as optimized ship handling techniques. These techniques include optimum trim, optimum ballast, optimum propeller and propeller inflow considerations. The guidelines also raise other issues for energy efficiency, such as those concerning hull maintenance, propulsion system, propulsion system maintenance, waste heat recovery, improved fleet management, improved cargo handling, energy management and fuel type, age and operational service life of a ship, trade and sailing area.²² The guidelines further encourage the "[d]evelopment of computer software for the calculation of fuel consumption, for the establishment of an emissions "footprint", to optimize operations, and the establishment of goals for improvement and tracking of progress may be considered."²³ They also suggest on-board application of renewable energy sources as well the feasibility of wind assisted propulsion.²⁴

The amendment of the MARPOL Convention makes SEEMP compulsory for every vessel and also provides that the "SEEMP shall be developed taking into account guidelines adopted by the IMO."²⁵ The Convention obligates the ship-owner to take into account the guidelines adopted by the IMO but does not make it compulsory to follow those guidelines. This leaves a broad discretion to the ship-owner to decide what measures to adopt for ensuring energy efficiency. Although SEEMP is mandatory, it does not impose a specific energy efficiency target for ships or companies.

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ *Ibid.*

²¹ *Ibid.*

²² *Ibid.*

²³ *Ibid.*

²⁴ *Ibid.*

²⁵ MARPOL 73/78, *supra* note 5, Annex VI Regulation 22.

2.2 EEDI

On the other hand, EEDI imposes binding obligations to reduce GHG emissions from ships by introducing a minimum energy efficiency level per capacity mile for different ship types and size segments. EEDI provisions are applicable to new ships,²⁶ new ships which have undergone a major conversion²⁷ and new or existing ships which have undergone a major conversion that is so extensive that the ship is regarded by the Administration as a newly constructed ship.²⁸

The ships for which EEDI is applicable are required to attain EEDI using a formula prescribed by Regulation 21 of Annex VI of the MARPOL Convention. This regulation prescribes different levels of reduction target for bulk carrier, gas carrier, tanker, container ship, general cargo ships, refrigerated cargo carrier, combination carrier.²⁹ The regulation prescribes a progressive increase in reduction target over four phases: Phase 0- 1 Jan 2013 – 31 Dec 2014; Phase 1- 1 Jan 2015 – 31 Dec 2019; Phase 2- 1 Jan 2020 – 31 Dec 2024; Phase 3- 1 Jan 2025 and beyond. It is assumed that the shipping sector will be able to take more onerous emission reduction targets with the progressive advancement of applicable technology and equipment. However, there is scope for reconsidering this target. According to Regulation 21(6) of the MARPOL Convention, “At the beginning of Phase 1 and at the midpoint of Phase 2, the Organization shall review the status of technological developments and, if proven necessary, amend the time periods, the EEDI reference line parameters for relevant ship types and reduction rates set out in this regulation.”³⁰ There is scope for increasing or decreasing the target depending on the level of technological development.

Unlike previous IMO legal instruments relating to the prevention of vessel-source pollution, the EEDI regulation does not prescribe any specific equipment or technology. According to the IMO, it “is a non-prescriptive, performance-based mechanism that leaves the choice of technologies to use in a specific ship design to the industry. As long as the required energy efficiency level is attained, ship designers and builders are free to use the most cost-efficient solutions for the ship to comply with the regulations.”³¹ The attained EEDI shall be calculated taking into account guidelines developed by the IMO. The IMO has developed three guidelines in this regard.³²

²⁶ “New ship” means a ship: 1. for which the building contract is placed on or after 1 January 2013; or 2. in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013; or 3. the delivery of which is on or after 1 July 2015. MARPOL 73/78, *supra* note 5, Annex VI Regulation 2.3.23.

²⁷ “Major conversion” means in relation to Chapter 4 a conversion of a ship: 1. which substantially alters the dimensions, carrying capacity or engine power of the ship; or 2. which changes the type of the ship; or 3. the intent of which in the opinion of the Administration is substantially to prolong the life of the ship; or 4. which otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of the present Convention not applicable to it as an existing ship; or 5. which substantially alters the energy efficiency of the ship and includes any modifications that could cause the ship to exceed the applicable required EEDI as set out in regulation 21. MARPOL 73/78, *supra* note 5, Annex VI Regulation 2.3.24.

²⁸ *Ibid.*

²⁹ *Ibid.*

³⁰ *Ibid.*

³¹ IMO, “Technical and Operational Measures”, online: <<http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Technical-and-Operational-Measures.aspx>> (accessed 6 September 2013).

³² *Guidelines for Calculation of Reference Lines for Use with the Energy Efficiency Design Index (EEDI)*, Res MEPC.215(63), Annex 11, IMO Doc MEPC 63/23/Add.1, (2 March 2012); *Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index (EEDI) for New Ships*, Res MEPC.212(63), Annex 8, IMO Doc MEPC 63/23, (2 March 2012); *2012 Guidelines on Survey and Certification of the Energy*

The EEDI is applicable only to ships of 400 gross tonnage and above. Moreover, these ships have a leeway period. Regulation 19 allows the Administration to waive compliance with the EEDI requirements until four years after the entry into force date of the regulations.³³

The IMO is expecting significant emission reductions and cost savings for the shipping industry by implementing these regulations. As observed in a document published by the organization:

“By 2020, between 100 and 200 million tonnes of annual CO₂ reductions are estimated from the introduction of the EEDI for new ships and the SEEMP for all ships in operation, a figure that, by 2030, will increase to between 230 and 420 million tonnes of CO₂ annually. In other words, the reductions will in 2020 be approximately between 10 and 17% and by 2030 between 19 and 26% below business as usual. The reduction measures will also result in a significant saving in fuel costs to the shipping industry, although these savings require deeper investments in more efficient ships and more sophisticated technologies than the business as usual scenario. The annual fuel cost saving estimate gives an average figure of US\$50 billion by 2020 and of US\$200 billion by 2030.”³⁴

However, the implementation of these regulations may involve some legal and practical challenges, as unlike many other IMO environmental legal instruments, these regulations have not been adopted unanimously. These regulations create some serious challenges for Asian countries, particularly those that voted against them. Usually, an international legal instrument creates implementation challenges for parties. The following part discusses how these regulations may even create challenges for non-parties.

3. Legal Challenges for Asian Countries

Asian countries have very divergent interests in respect of energy efficiency measures. As a very diverse continent Asia hosts Annex 1 countries, non-Annex 1 countries, developing countries, least developed countries (LDCs), flag states, ship building nations, states having bunker business, bunker oil exporting contraries, climate change victim countries, and both export and import countries. Presumably, they did not take a similar stance, unlike European countries. Among the Asian states, Bangladesh, Japan, Malaysia, the Republic of Korea, and Singapore voted in favor of the amendment to Annex VI of the MARPOL Convention, while China, Kuwait and Saudi Arabia voted against it. Only parties to Annex VI of the MARPOL Convention were eligible to vote. India is not party to Annex VI of the MARPOL Convention, hence was not eligible to vote. However, throughout the negotiation process, India's position was very similar to China, Kuwait and Saudi Arabia's.

Some Asian countries took a leading role in the negotiation process. For example, China and India played an active role in representing the interest of leading developing countries. On the other hand, Saudi Arabia took a leading role as an oil exporting country. Japan played a

Efficiency Design Index (EEDI), Res MEPC.214(63), Annex 19, IMO Doc MEPC 62/24/Add.1, (2 March 2012).

³³ MARPOL 73/78, *supra* note 5, Annex VI.

³⁴ IMO, “Main events in IMO’s work on limitation and reduction of greenhouse gas emissions from international shipping” (October 2011), online: <http://www.imo.org/MediaCentre/resources/Documents/Main%20events%20IMO%20GHG%20work%20-%20October%202011%20final_1.pdf> (accessed 6 September 2013).

crucial role as the only Annex 1 developed country of Asia. The participation of Asian LDCs, many of which are the main victims of climate change, was very marginal.

It is clear from the voting pattern that some Asian countries may not join this new amendment. The question lies in whether they will be able to avoid the impact of this amendment on their shipping and trade sectors.

First of all, regardless of whether they join the amendment, there will be an impact on their trade. Many countries will implement these regulations in their maritime sector and if there is an increase in the cost of operation, the trade sector of non-party states will also suffer as no country solely relies on its own vessels for the export and import of goods.

Second, vessels flying the flag of non-party states may also have to adhere to these regulations as many coastal and port states that are party to the regulations may implement the amendments within their territory.

Part XII of the United Nations Convention on the Law of the Sea (UNCLOS) imposes a general obligation to protect and preserve the marine environment.³⁵ It gives states a sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment.³⁶ The convention requires states to take all measures necessary for prevention, reduction and control of pollution of the marine environment from all sources.³⁷ Article 211 of UNCLOS particularly deals with vessel source pollution. This article imposes a general obligation on states to establish international rules and standards for prevention, reduction, and control of vessel-source marine pollution.³⁸ UNCLOS has also obligated the state parties to adopt laws and regulations for the prevention, reduction and control of pollution of the marine environment from vessels flying their flag or of their registry. Such laws and regulations shall at least have the same effect as that of “generally accepted international rules and standards”.³⁹ This indicates that “generally accepted international rules and standards” is a minimum level of control. In the exercise of their sovereignty within their territorial sea, coastal states may adopt laws and regulations for the prevention, reduction and control of marine pollution.⁴⁰

The issue of vessel-source air pollution has been handled separately from pollution from or through the atmosphere. UNCLOS imposed an obligation on both coastal and flag states to create a national legal framework for prevention of vessel-source air pollution taking into account internationally agreed rules, standards and recommended practices and procedures.⁴¹ Again, article 222 of UNCLOS imposes an obligation on the states to implement and enforce international rules and standards for the prevention of vessel-source air pollution.⁴²

UNCLOS does not prescribe a large set of new standards for the prevention of vessel-source pollution. Instead, it mainly incorporates within its ambit standards prescribed in other

³⁵ *United Nations Convention on the Law of the Sea*, opened for signature 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994) art. 192 [UNCLOS].

³⁶ UNCLOS, *ibid.*, art. 193.

³⁷ UNCLOS, *ibid.*, art. 194(1).

³⁸ UNCLOS, *ibid.*, art. 211(1). See generally Daniel Bodansky, “Protecting Marine Environment from Vessel Source Marine Pollution: UNCLOS III and Beyond” (1991) 18 ELQ 719; JW Kindt, “Vessel-Source Pollution and the Law of the Sea” (1984) 17 VJTL 287.

³⁹ UNCLOS, *ibid.*, arts. 211(2) and 94.

⁴⁰ UNCLOS, *ibid.*, art. 211(4).

⁴¹ UNCLOS, *ibid.*, art. 212(1).

⁴² UNCLOS, *ibid.*, art. 222.

international legal instruments. The IMO's official position is that "while UNCLOS defines flag, coastal and port State jurisdiction, IMO instruments specify how State jurisdiction should be exercised so as to ensure compliance with safety and shipping anti-pollution regulations."⁴³ In this regard, UNCLOS introduced some rules of reference which vary depending on subject matter. UNCLOS very frequently uses some rules of reference including: "generally accepted international regulations", "applicable international instruments", "generally accepted international regulations, procedures and practices", and "generally accepted international rules and standards" (GAIRS). There is a serious debate among scholars on the precise meaning of the rules of reference, particularly on the GAIRS. This phrase has been frequently used in Part XII of UNCLOS while elaborating obligations towards marine environmental protection.⁴⁴ Some scholars consider that in the case of vessel-source marine pollution, the GAIRS mainly refers to the MARPOL Convention.⁴⁵ As long as it can be established that a specific standard attains the "sufficiently general state practice" status in a certain area of regulation, the rule of reference may extend to that standard. The important issue is the "sufficiently general acceptance" of that particular standard, not the general acceptance of the legal instrument which incorporated the standard.⁴⁶ Interpretation of the phrase "applicable international instruments" must be different from GAIRS. It is very clear from the wording that in the case of "applicable international instruments", concerned states must subscribe to the relevant legal instrument to be obligated by the same.⁴⁷

It is important to determine whether the regulations on energy efficiency introduced by the amendment can be treated as GAIRS under UNCLOS. GAIRS is arguably a standard adopted by a competent international organization. The main issue here is whether these regulations can be treated as laws and regulations for the prevention, reduction, and control of pollution of the marine environment from vessels. This issue was hotly debated in the negotiation process.⁴⁸ It was argued by a number of delegations "that MARPOL Annex VI was not the proper legal instrument to include energy efficiency measures for ships, that such measures were not within its scope, and that the structure of Annex VI prevented such measures from being effective. In their view, CO₂ was not technically a pollutant and therefore had no place in the MARPOL Convention."⁴⁹ However, Deputy Director of the IMO Legal Office gave an opinion that "article 2 of the [MARPOL] Convention defines "discharge" as meaning "any release howsoever caused from a ship and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying." Emissions from inefficient ships' engines burning low grade fuel would appear to fall squarely within this definition." In the MEPC meeting, it was agreed by a majority of 60 member states that MARPOL Convention Annex VI was the appropriate vehicle for enacting energy efficiency requirements for ships.⁵⁰ MARPOL Convention is the most important international treaty for the prevention of marine pollution by ships. Inclusion of these energy efficiency regulations within the MARPOL Convention may arguably call for the acceptance of these regulations as applicable international

⁴³ IMO, *Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization*, IMO Doc LEG/MISC.7 (19 January 2012) at pg 12.

⁴⁴ UNCLOS, *supra* note 35, arts. 211(2), 211(5), 211(6) and 226 (1).

⁴⁵ Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: The Law and Politics of International Regulation* (Cambridge University Press, 2006) at 196.

⁴⁶ *Ibid* at 196-197.

⁴⁷ *Ibid*.

⁴⁸ IMO, *Report of the Marine Environment Protection Committee on Its Sixtieth Session*, IMO Doc MEPC 60/22 (12 April 2010).

⁴⁹ *Ibid* at pg 27.

⁵⁰ *Ibid* at pg 29.

instruments. In the case of applicable instruments, concerned states must subscribe to the relevant legal instrument to be obligated by the same. However, persistent opposition from some countries from the beginning may cause problems for the recognition of these regulations as GAIRS.

One of the ways in which a vessel flying the flag of a non-party to the Energy Efficiency Regulations may be bound by the regulations is arguably the coastal state jurisdiction. Coastal states may, in the exercise of their sovereignty within their territorial sea, adopt laws and regulations for the prevention, reduction and control of marine pollution from foreign vessels, including vessels exercising the right of innocent passage. However, such laws and regulations shall not hamper innocent passage of foreign vessels.⁵¹ UNCLOS affirms the right to innocent passage for vessels of all countries in the territorial sea of other countries.⁵² Nevertheless, any act of “willful and serious pollution” is illegal while a ship is in innocent passage⁵³. The term “willful and serious pollution” severely limits coastal states’ ability to control vessel-source marine pollution while a ship is in innocent passage. As the coastal state can take action only if there is willful and severe pollution, no preventive action can be taken even if the vessel is not equipped with the necessary equipment for pollution prevention. To control ship-generated pollution, a coastal state may enact laws for controlling innocent passage through the territorial sea, provided that its national laws are in conformity with international law.⁵⁴ Moreover, “such laws and regulations shall not apply to the design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards”.⁵⁵ These provisions are somewhat ambiguous. It is clear that a coastal state can enact national laws to give effect to international law regulating design, construction, manning or equipment of ships. However, it is not very clear whether a coastal state can take action against a foreign ship that disobeys these requirements but is not engaged in any willful and severe pollution while in innocent passage. Finally, UNCLOS grants the coastal states a right and jurisdiction for protecting and preserving the marine environment in Exclusive Economic Zones (EEZ)⁵⁶. UNCLOS limits the prescriptive jurisdiction of coastal states in respect of their EEZ to adopting laws and regulations conforming to and giving effect to generally accepted international rules and standards.⁵⁷ UNCLOS also provides that in straits used for international navigation, ships in transit passage shall comply with generally accepted international environmental rules and procedures.⁵⁸

Port states have the right to prescribe compliance to the Energy Efficiency Regulations as a condition for the entry of foreign vessels. According to UNCLOS article 211(3), states “which establish particular requirements for the prevention, reduction and control of pollution of the marine environment as a condition for the entry of foreign vessels into their ports or internal waters or for a call at their off-shore terminals shall give due publicity to such requirements and shall communicate them to the competent international organization.” It is very clear from this article that a port state can impose compliance to the Energy Efficiency Regulations as a condition for the entry of foreign vessels to its port.

⁵¹ UNCLOS, *supra* note 35, art. 211(4).

⁵² UNCLOS, *ibid.*, art. 17.

⁵³ UNCLOS, *ibid.*, art. 19.

⁵⁴ UNCLOS, *ibid.*, art. 21.

⁵⁵ UNCLOS, *ibid.*, art. 21(2).

⁵⁶ UNCLOS, *ibid.*, art. 56.

⁵⁷ UNCLOS, *ibid.*, art. 211(5).

⁵⁸ UNCLOS, *ibid.*, art. 39(2)(b).

MARPOL introduced a system of certification. Most of the ships operating international maritime transportation have to carry some certificates on board as a *prima facie* evidence of compliance with the MARPOL Convention. Any country can inspect a ship to verify these certificates while it is voluntarily in her port or offshore terminal. If “there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate”, the port state can detain the ship.⁵⁹ According to the MARPOL Convention, “[w]ith respect to the ship of non-Parties to the Convention, Parties shall apply the requirements of the present Convention as may be necessary to ensure that no more favorable treatment is given to such ships.”⁶⁰ The Energy Efficiency Regulations also introduced a new certification and survey system within the MARPOL Convention. They introduced a new certificate called the “International Air Pollution Prevention Certificate.”⁶¹ However, in relation to the Energy Efficiency Regulations, “any port State inspection shall be limited to verifying, when appropriate, that there is a valid International Energy Efficiency Certificate on board, in accordance with article 5 of the Convention.”⁶²

From this discussion it is clear that due to the unique characteristics of the international shipping industry, mere non-ratification of the Energy Efficiency Regulations will not give the Asian countries who did not sign the amendment a chance to avoid these regulations. Parties to the Energy Efficiency Regulations may impose the adherence to these regulations as a condition of entry into their ports. This situation makes more critical the importance of issues concerning the Principle of Common But Differentiated Responsibility (CBDR Principle), providing assistance, and technology transfer. The next part discusses these issues.

4. The Issues Concerning the CBDR Principle, Assistance, and Technology Transfer

According to Article 2(2) of the Kyoto Protocol, the parties included in Annex 1 shall pursue limitation or reduction of emissions of greenhouse gases from marine bunker fuels, working through the IMO. This provision of the Kyoto Protocol is mainly guided by the CBDR Principle. However, the IMO follows the principle of non-discrimination and equal treatment of all vessels irrespective of their nationality. The IMO’s policy of equal treatment is arguably justifiable given the reality in the international maritime sector that the majority of global vessels fly the flag of developing countries.⁶³

CBDR and non-discrimination were the central issue of conflict between some leading developing and developed countries.⁶⁴ Through a submission, China, Saudi Arabia and South Africa stated that “the UNFCCC and its Kyoto Protocol are the outcomes of long and hard work by all involved countries. They reflect the broad consensus among all parties and serve as the legal basis and guide for international cooperation on combating climate change.”⁶⁵ The CBDR Principle is the cornerstone of international climate change law.⁶⁶ They are of the

⁵⁹ MARPOL 73/78, *supra* note 5, art. 5.

⁶⁰ MARPOL 73/78, *ibid*, art. 5 (4).

⁶¹ MARPOL 73/78, *ibid*, Annex VI, Regulation 6.

⁶² MARPOL 73/78, *ibid*, Annex VI, Regulation 10(5).

⁶³ Institute of Shipping Economics and Logistics, *Shipping Statistics and Market Review*, vol 55 (11), (2011) at 5.

⁶⁴ Md. Saiful Karim & Shawkat Alam, “Climate Change and Reduction of Emissions of Greenhouse Gases from Ships: An Appraisal” (2011) 1 *Asian Journal of International Law* 131.

⁶⁵ IMO, Comments on the Proposed Mandatory Energy Efficiency Regulations, Submitted by China, Saudi Arabia and South Africa, IMO Doc MEPC 62/5/10 (5 May 2011).

⁶⁶ *Ibid*.

opinion that introducing the same responsibilities to ships flying the flag of developing countries is a clear deviation from the CBDR Principle as established by the UNFCCC and its Kyoto Protocol.⁶⁷ Nevertheless, the member states decided that the Energy Efficiency Regulations will be applicable for all vessels irrespective of their nationality. However, the Energy Efficiency Regulations include the CBDR Principle in another way. According to Regulation 23(1) “Administrations shall, in co-operation with the Organization and other international bodies, promote and provide, as appropriate, support directly or through the Organization to States, especially developing States, that request technical assistance.”⁶⁸ Unfortunately, similar provisions of the MARPOL Convention have not been properly implemented for other types of pollution.⁶⁹ According to Regulation 23(2), “the Administration of a Party shall co-operate actively with other Parties, subject to its national laws, regulations and policies, to promote the development and transfer of technology and exchange of information to States which request technical assistance, particularly developing States, in respect of the implementation of measures to fulfill the requirements of chapter 4 of this annex, in particular regulations 19.4 to 19.6.”⁷⁰ However, this regulation does not impose a direct obligation for transfer technology and assistance. Moreover, it makes the provision subject to national laws of the respective countries. Previous experience regarding similar provisions of other IMO instruments does not show any ray of hope for developing countries.⁷¹

The issue of assistance and technology transfer is still a hotly debated issue in the negotiation process. In the IMO MEPC 64 held in October 2012, Brazil, China, India, Peru, Saudi Arabia and South Africa submitted that priority should be given to “the adoption of an ambitious MEPC resolution to ensure financial, technological and capacity-building support from developed countries for the implementation of regulations on energy efficiency for ships by developing countries.”⁷² Finally, the IMO MEPC 65 adopted a Resolution on Promotion of Technical Co-Operation and Transfer of Technology Relating to the Improvement of Energy Efficiency of Ships.⁷³ Like the abovementioned regulation, this resolution also does not establish any significant legal obligation for financial assistance or technology transfer.

5. Conclusion

If properly implemented the Energy Efficiency Regulations have a good prospect for significant reduction of emissions from the maritime sector. However, non-implementation of the CBDR Principle may result in a serious bottleneck in the global acceptance of these regulations. Nevertheless, considering the nature of the industry, this new instrument will hopefully encourage some technological development that may create environmentally sound and less costly alternatives to existing practice. The Energy Efficiency Regulations have created a unique problem for Asian countries. Leading Asian developing countries may have to implement these regulations despite their opposition. LDCs in Asia may face serious

⁶⁷ *Ibid.*

⁶⁸ MARPOL 73/78, *supra* note 5, Annex VI.

⁶⁹ Md. Saiful Karim, “Implementation of the MARPOL Convention in Developing Countries” (2010) 79 NJIL 303 [Karim, “Implementation”].

⁷⁰ MARPOL 73/78, *supra* note 5, Annex VI.

⁷¹ Karim, “Implementation”, *supra* note 69.

⁷² *Further work on GHG Emissions from Ships, Submitted by Brazil, China, India, Peru, Saudi Arabia and South Africa*, IMO Doc MEPC 64/5/9 (27 July 2012) at pg 3.

⁷³ *Promotion of Technical Co-Operation and Transfer of Technology Relating To the Improvement of Energy Efficiency of Ships*, IMO Res MEPC 229(65), Annex 4, IMO Doc MEPC 65/22 (17 May 2013).

problems in implementing these regulations due to their financial and technical inability. Previous experience shows that the IMO's technical cooperation program is not very successful in generating adequate financial and technical assistance for LDCs.⁷⁴ Therefore, it is of paramount importance that developed country members should come forward to fulfill their commitment towards technical cooperation.

⁷⁴ See Karim, "Implementation", *supra* note 69.