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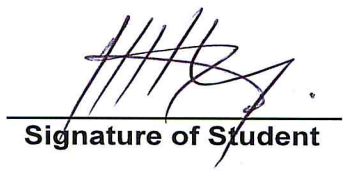
Title of MARITIME LEGISLATIVE DRAFTING PROJECT:

MARINE POLLUTION (PREVENTION OF AIR POLLUTION) REGULATIONS. REGULATIONS TO INCORPORATE ANNEX VI OF THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL) 1973, AS AMENDED INTO THE LAW OF NAMIBIA AND TO PROVIDE FOR ITS EFFECTIVE IMPLEMENTATION.

In accordance with the Regulations for the Degree of LL.M. in International Maritime Law / M.Hum. in International Maritime Legislation, I, the undersigned, do hereby declare that the Maritime Legislative Drafting Project being presented with this declaration is my own personal work and that it has not been previously submitted, or is not concurrently being submitted in candidature for any other degree or diploma.



Signature of Student

IMO
INTERNATIONAL MARITIME LAW INSTITUTE
Established under the auspices of the International Maritime Organization
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MARINE POLLUTION (PREVENTION OF AIR POLLUTION) REGULATIONS

Regulations to Incorporate Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) 1973, as amended

into the law of Namibia and to provide for its effective implementation thereof

A Legislation Drafting Project submitted in partial fulfillment of the requirements for the award of the Degree of Master of Humanities (M. Hum) in International Maritime Legislation at the IMO International Maritime Law Institute.

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Academic Year: 2019-2020

DECLARATION

I certify that he content of this work is the author's personal work, and have not been previously or concurrently submitted in candidature for any other degree; may not represent the official opinion of the Namibian Government, the IMO, IMLI and its staff.

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Uanangura Kaputu

07 August 2020

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1. INTRODUCTION

1.1. The Explanatory Note

This explanatory note is related to the draft of the Marine Pollution (Prevention of Air Pollution) Regulations (hereinafter referred to as Draft) to incorporate the Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) 1973, as modified by the Protocol of 1997, into the law of Namibia, and to provide for its effective implementation thereof. The explanatory note serves the purpose of assisting the reader of the Draft and to establish early enlightenment on the scope of the subject matter thereof. It does not become a mandatory portion of the Draft and has neither been endorsed by the Ministry of Works and Transport nor the Office of the Attorney-General of the Republic of Namibia. However, the statement in this explanatory note is highly recommended to be read in conjunction with the Draft although it is not a complete characterization of the Draft. Furthermore, this explanatory note and the suggested provisions for the Draft are not intended to act as the authoritative guide to the meaning of such provision.

1.2. Air Pollution and the dilemma of Climate Change

The dynamics between air pollution and the depletion of the ozone layer (greenhouse effect) has been considered as not only the greatest challenge of the 21st century, but is also foreseen as an inevitable catastrophe of the modern age, whose consequence; global warming and climate change, if not solved, will live to haunt future generations after us. Ross Garnaut, in his exhaustive review of the climate change problem for the Australian Government, called it a 'diabolical policy problem' and concluded his report with the statement: 'on a balance of probabilities, the failure of our generation would lead to consequences that would haunt humanity until the end of time'.[1] The current observed trend of global warming is driven primarily by a suite of greenhouse gases, including methane, nitrous oxide, and tropospheric ozone in addition to carbon dioxide (the most important of the gases). The major complexity of climate change is its global character.

[1] John S. Dryzek, Richard B. Norgaard and David Schlosberg (eds), *The Oxford Handbook of Climate Change and Society* (Oxford University Press 2011) 21.

It is centered around the two great fluids – the atmosphere and the ocean – that transport material and energy around the planet. Greenhouse gases, the emission of which represent the primary human influence on the climate system, are well mixed in the atmosphere; emissions from any particular location are transported around the Earth in a matter of weeks.[2] The primary source of energy for the Earth's climate is radiation from the Sun. An energy balance exists between incoming and outgoing solar radiation, but slight imbalances can bring about global heating or cooling due to "forcing"; a term used to describe disruptions in the main elements that impacts Earth's climate, including solar energy, atmospheric circulation, ocean currents, and even volcanic eruptions that lead to changes in climate.[3] Excess buildup of persistent greenhouse gases, primarily carbon dioxide, in the atmosphere is the primary force driving current changes in Earth's climate as they prevent radiation from leaving Earth and lead to warming of the surface.

The effects of increased global temperature are already evident: ice sheet coverage is waning in Polar Regions, glaciers are shrinking, and spring snow cover is decreasing in the Northern Hemisphere.[4] This adverse scientific reality is not limited to the Earth's climate, but has devastating consequences to human livelihood. The climate change phenomenon is forcing us humans to concern ourselves with the impact of ecological stress – degradation of soils, water regimes, atmosphere, and forests – upon our economic prospects.[5] Due to its devastating impact on human life, climate change remains one of the most complex and serious challenges facing human kind. The struggle against global warming and climate change has prompted policy and law makers to establish a human rights framework in international efforts to address climate change. Bringing a human rights framework in international efforts to address climate change has the potential to be responsive to the impacts that climate change will have on human life and on the people and countries with the fewest and most fragile resources.[6] This approach establishes the link between climate change and human rights, making certain environmental law transgressions as crime against humanity. It is asserted that anthropogenic climate change

[2] Ibid.
[3] Randall S. Abate, *Climate Change Impacts on Ocean and Coastal Law: U.S. and International Perspectives* (Oxford University Press 2015) 4.
[4] Ibid. 5
[5] Jane Holder and Maria Lee, *Environmental Protection, Law and Policy* (2nd edn, Cambridge University Press 2007) 212.
[6] Daniel A. Farber and Marjan Peeters, *Climate Change Law* (Edward Elgar Publishing, Inc. 2016) 43-44.

violates several basic human rights; the right to life, the right to health and the right to subsistence. The most well-known proponent of this argument, Simon Caney claims that as all persons have a human right not to be arbitrarily deprived of life, climate change can violate the human right to life in that it increases the frequency and severity of extreme weather events – such as tornadoes, storm surges, flooding and landslides – which can lead to the death of individuals.[7] Just as extreme weather events linked to climate change threaten the right to life, so too may they violate the right to health where heat waves, storms, fires, droughts and the like increase the number of people suffering from disease or injuries. Furthermore, climate change compromises the right to subsistence in that rising temperatures may lead to drought and decreased food security, sea level rise may decrease agricultural crop production by saltwater intrusion and inundation, while flooding can also cause crop failure.[8]

It is of ad most significance, for the purpose of this Draft, to assess Shipping as a human activity and its impact on the Marine Environment. For at least the past 4,000 years, shipping has been fundamental to the development of civilization, and today it mirrors the world economy. However, since the replacement of sail by steam and then diesel, ships have been making emissions to the air. By the early 1990's it was becoming apparent that, in some parts of the world, emissions of nitrogen oxides (NOx) and sulphur oxides (SOx) from ships were becoming a serious element in air pollution for coastal States with heavy shipping traffic in their coastal waters.[9] Even short-term exposure to NOx produces adverse respiratory effects, including airway inflammation, in healthy people and increased respiratory symptoms in people with asthma, and reduces resistance to respiratory infections. Exposure to SOx likewise weakens resistance to respiratory infections, and is linked to higher rates of mortality in humans, as well as being contributor to (with land-based emissions) to acid rain.[10] SOx emissions from ships has been worsening for decades, as a result of the increasing restrictions on the levels of sulphur in hydrocarbon fuels used on land: as restrictions have reduced the extent to which fuel oils with higher sulphur content can be used on land, so such fuel oils have become

[7] Ibid. 46
[8] Ibid.
[9] United Nations, *The first Global Integrated Marine Assessment: World Ocean Assessment* I (Cambridge University Press 2017) 261.
[10] Ibid.

more attractive for use at sea, because there were no restrictions and the reduced demand on land lowered the price.[11] One would agree that shipping can be seen as a further source of chlorofluorocarbons and other substances which contribute to the depletion of the ozone layer, thus enhancing the effect of global warming and climate change.

It is against this background that actions at global level to combat climate change intensified. The 1992 United Nations Convention on Climate Change, the 1997 Kyoto Protocol and its Clean Development Mechanism (CDM), and the 2016 Paris Agreement aimed at greenhouse-gas-emissions mitigation are all necessary steps at the global arena to combat climate change.[12] In 1997 a new annex to the International Convention for the Prevention of Pollution from Ships (MARPOL); Annex VI, was adopted to limit the main air pollutants contained in ships' exhausts, including NOx and SOx, as well as to regulate shipboard incineration and emissions of volatile organic compounds (VOCs) from tankers.[13]

2. THE MARPOL ANNEX VI

This section will provide a brief overview of the background of MARPOL and its annexes. Further on, it will explain the main features of MARPOL Annex VI, the air pollutant aspects there under, as well as the expectations of the IMO towards the implementing agents of the Convention; the contacting States.

2.1. Historical background of MARPOL 1973

The United Nations Convention on the Law of the Sea (UNCLOS), despite its shortcomings, remain the cornerstone of the international maritime legal regime, upon which the rule of international maritime law and ocean governance is served, across all stages of its transformation to date. Protection of the environment was not the IMO's original mandate; its main interest was maritime safety.[14] Because of the fact that

[11] Ibid 262.
[12] See Farber and Peeters (n. 6) 44.
[13] United Nations (n. 9) 261.
[14] Malgosia Fitzmaurice, 'The International Convention for the Prevention of Pollution From Ships' in David Joseph Attard et al. (eds), *The IMLI Manual on International Maritime Law (Volume III) - Marine Environmental Law and Maritime Security Law* (Oxford University Press 2016) 33.

UNCLOS cannot be amended, one would say, the establishment of IMO instruments and their protocols on issues that could amend the convention has been used as the major tool to uphold the value and conclusiveness of the convention as indented by its founders, therefore necessitating a parallel interpretation and application. The emergence of a more strongly expressed obligation to protect the marine environment is evidenced by Articles 192-5 of the 1982 UNCLOS, by regional treaties, and by other multilateral agreements negotiated progressively since 1954.[15]

In 1954, the IMO became the depository of the first 1954 Convention for the Prevention of Pollution from Oil (OILPOL), and since then the protection of the marine environment has become one of the most important activities of the IMO.[16] OILPOL regulated the amount of oily water which could be discharged in the oceans, the places it could be dumped, and encouraged the Parties to install reception facilities where oily water could be discharged.[17] Clearly, the approach to marine environment pollution control was limited in scope. In 1962, IMO adopted amendments to the Convention which extended its application to ships of a lower tonnage and also extended the "prohibited zones" (special areas where dumping of oily residues were prohibited).[18] The next fundamental amendment of the OILPOL was effected in 1969 after the Torrey Canyon incident, when a procedure developed by the oil industry and known as 'load-on-top' (LOT) was introduced to save oil and reduce pollution, which was followed by the downsizing of tankers after 1972 so that; in case of damage to the vessel, only a limited amount of oil could enter the sea.[19] The LOT system failed expectations of producing environmental benefits, mostly due to difficulties in its operation and the lack of skilled crews as well as due to unscrupulous crews which circumvented LOT and simply discharged contaminated dirty ballast water.[20]

The 1967 Torrey Canyon accident in which the oil tanker ran aground while entering the

[15] Patricia Birnie, Alan Boyle and Catherine Redgwell (eds), *International Law & the Environment* (3rd edn, Oxford University Press 2009) 387.
[16] Fitzmaurice (n. 14).
[17] Ibid 34.
[18] ΕΓΚΩΜΙΤΗΣ ΜΑΡΙΝΟΣ, 'The History of MARPOL', at <https://maredu.gunet.gr/modules/document/file.php/MAK265/Dissertations%20in%20English/The%20History%20of%20Marpol.pdf> (accessed 17th January 2020).
[19] Fitzmaurice (n. 14) 34.
[20] Ibid.

English Channel and spilled her entire cargo of 120,000 tons of crude oil into the sea is considered as the catalyst for the adoption of the MARPOL convention; it was the biggest oil tanker spill recorded at the time, which led to the creation of a devoted subcommittee on pollution from ships at IMO (Marine Environment Protection Committee) and the development and adoption of MARPOL, as well as a series of global treaties addressing liability and compensation for damage from oil pollution.[21] The sinking of large oil tankers such as the *Torrey Canyon*, *Amoco Cadiz*, *Exxon Valdez*, *Nakhodka*, *Erika*, or *Prestige* exemplifies the scale and potential severity of such accidents, whose seriousness derives mainly from the volume of oil or other pollutants released in one place; causing harm to coastal communities, fisheries, wildlife, and local ecology.[22] Each of these accidents necessitated the subsequent modification of the MARPOL and its annexes.

The Annexes which are incorporated in MARPOL are the following:

Annex I: Prevention of pollution by oil (entered into force 2 October 1983),

Annex II: Control of pollution by noxious liquid substances (entered into force on 6 April 1987),

Annex III: Prevention of pollution by harmful substances in packaged form (entered into force on 1 July 1992),

Annex IV: Prevention of pollution by sewage from ships (entered into force on 27 September 2003),

Annex V: Prevention of pollution by garbage from ships (entered into force 31 December 1988), and

Annex VI: Prevention of Air Pollution from Ships (entered into force on 19 May 2005).[23]

At the moment, 153 countries are members of the MARPOL 73/78 Convention, representing 98.52% of the world shipping tonnage, which means that it has global application.[24]

2.2. Main attributes of Annex VI, MARPOL 1973

[21] ΜΑΡΙΝΟΣ (n. 18) 11.
[22] Birnie, Boyle and Redgwell (n. 15).
[23] ΜΑΡΙΝΟΣ (n. 18) 12-13.
[24] Ibid.

The seventeenth session of the IMO Assembly, in November 1991, recognizing the urgent necessity of establishing an international policy on prevention of air pollution from ships, considered and decided, in resolution A.719 (17), to develop a new annex to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL Convention).[25] This Annex was added in 1997 in order to deal with local and global air pollution and environmental problems, and to minimize emissions from ships (e.g. SOx, NOx, ODS, VOC).[26] Stricter amendments of the Annex VI intents to reduce global emissions of SOx, NOx and particular matter through the introduction of Emission Control Areas (ECAs), while the revised NOx Technical Code 2008 includes a new chapter based on the agreed approach for regulation of existing (pre-2000) engines established in MARPOL Annex VI.[27] Furthermore, revisions to the regulations for ozone-depleting substances, volatile organic compounds, shipboard incineration, reception facilities, and fuel oil quality have been made, with addition on regulations on fuel oil availability.[28]

The provisions of this Annex apply to all ships engaged in international voyage except for government and war ships, and pleasure crafts with not less than 400 gross tonnage.[29] However, some regulations under the Annex shall only apply to certain degree of tonnage and engine capacity, to be explained further in this Draft. Nonetheless, any emission necessary for securing the safety of life or that of a ship, or resulting from damage to a ship or its equipment, are exempted. Further exceptions are placed on ship emission reduction trial and for the purpose of research, and any emission from sea-bed mineral activities, while discretion is given to contracting governments to allow the fitting of *Equivalents;* material, appliance or apparatus to be fitted in a ship or other procedures, alternative fuel oils or compliance methods used as alternative to that required by the Annex, as long as the same are at least effective in terms of emission reductions as that required by the Annex.[30]

[25] IMO, 'MARPOL Annex VI and NTC 2008 with Guidelines for Implementation' (2013 edn) 1.
[26] Fitzmaurice (n. 14) 55.
[27] Ibid 56.
[28] Ibid.
[29] IMO, 'MARPOL Annex VI', Chapter 1, Regulation 1.
[30] Ibid., Regulation 3 & 4.

Chapter 2 of this Annex mainly makes provisions for inspection, certification and survey. The standard 5-years validity of IMO harmonized certification[31] was applied to the issuance of an International Air Pollution Prevention Certificate to comply with provisions of Chapter 3.[32] Additional certificates under chapter 4 are the International Energy Efficiency Certificate which requires no strict validity date but depend on the company, ship, flag change or modification; and the Statement of Compliance for Fuel Oil Consumption Reporting whose validity is up to one calendar year.[33]

Furthermore, Annex VI provides limits on SOx and NOx emissions from ship exhausts and prohibits the deliberate emissions of ozone depleting substances.[34] The Annex also enforces a global limit of 4.50% m/m on the sulphur content of fuel oil prior to 1st January 2012; 3.50% m/m on and after 1st January 2012, and 0.50% m/m on and after 1st January 2020; and calls on the IMO to monitor the worldwide average sulphur content of fuel. It contains provisions allowing for special SOx Emission Control Areas (SECAs) to be established with more stringent controls on sulphur emissions. In these areas, the sulphur content of fuel oil used on board ships must not exceed 1.50% m/m prior to 1st July 2010; 1.00% m/m on and after 1st July 2010; 0.10% m/m on and after 1st January 2015.[35] Furthermore, ships are expected to fit an exhaust gas cleaning system or use any other technological method to limit SOx emissions. The Protocol designates the Baltic Sea Area as a SOx Emission Control area. In July 2005, the North Sea was adopted as a SOx Emission Control Area. It also prohibits deliberate emissions of ozone depleting substances which include halons and chlorofluorocarbons (CFCs).[36] New installations containing ozone-depleting substances are prohibited on all ships. Though, new installations containing hydro-chlorofluorocarbons (HCFCs) are permitted only until 1 January 2020.[37] Volatile Organic Compounds (VOCs) emissions are to be regulated, particularly for tankers, but strictly in accordance with the provisions of the Annex. This includes a proper VOC management plan implemented on board

[31] IMO Resolution A.1053 (27), 'Survey Guidelines under the Harmonized System of Survey and Certification (HSSC)', adopted on 30 November 2011.
[32] IMO, *MARPOL Annex VI,* Chapter 2, Regulation 5.
[33] Ibid, Regulation 6.
[34] Ibid., Chapter 3, Regulation 14.
[35] Ibid.
[36] Ibid., Regulation 12.
[37] IMO, '*Prevention of Air Pollution from Ships'* (2016).

which need to be approved by the Flag State.[38]

Annex VI also sets limits on emissions of nitrogen oxides (NOx) from diesel engines.[39] This involves the enforcement of a mandatory NOx Technical Code, which defines how this shall be done. The Annex also prohibits the incineration onboard ship of certain products, such as contaminated packaging materials and polychlorinated biphenyls (PCBs). The allowable shipboard incineration mechanisms are explicitly stated together with the suitable guidelines issued by the IMO.[40]

The Annex makes further emphasis for the flag State to ensure the provision of facilities adequate to meet the needs of ships using its repair ports for the reception of ozone depleting substances and equipment containing such substances when removed from ships; to meet the needs of ships using its ports, terminals or repair ports for the reception of exhaust gas cleaning residues from an exhaust gas cleaning system.[41] Furthermore, a rather sensible step to promote the availability of fuel oils that comply with Annex VI is to be established by the contracting state in regards to the availability of compliant fuel oils in its ports and terminals. These items shall be officially declared to IMO via IMO GISIS.[42]

The IMO adopted mandatory technical and operational energy efficiency measures which are expected to significantly reduce the amount of CO_2 emissions from international shipping.[43] These mandatory measures; the Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP) were entered into force on 1 January 2013.[44] Finally, the IMO has adopted important guidelines aimed at supporting implementation of the mandatory measures to increase energy efficiency and reduce GHG emissions from international shipping, thereby paving the way for the regulations on EEDI and SEEMP to be smoothly implemented by Administrations and the shipping

[38] IMO, 'MARPOL Annex VI', Chapter 3, Regulation 15.
[39] Ibid., Regulation 13.
[40] Ibid., Regulation 16.
[41] Ibid., Regulation 17.
[42] Ibid., Regulation 18; and '*GISIS' stands for IMO-Global Integrated Shipping Information System: The IMO web account framework to manage mandatory IMO modules of global database.*
[43] Ibid., Chapter 4, Regulation 22.
[44] Ibid., Regulations 19, 20 and 21.

industry.

3. WHY THE NEED TO INCORPORATE MARPOL ANNEX VI INTO THE LAW OF NAMIBIA?

There are three major reasons that necessitate a prompt incorporation of MARPOL Annex VI into the laws of Namibia. Firstly, the health concerns around the Southern African region are mostly related to air pollution, hence the need to address ship source air pollution through this legislative intervention. Secondly, the aid that would be provided by MARPOL Annex VI will complement the existing pollution laws and policy in Namibia. Thirdly, drafting Annex VI provides an opportunity that one would describe as a 'one-stop-shop' for accession and implementation as Namibia has not yet acceded to Annex VI, thus the Draft would serve as a motivation for accession and a guideline for implementation after accession. Furthermore, the worrisome health hazards posed by air pollution and its devastating impact on climate change are now making practical imprints on the African continent in general and the Southern African sub-region in particular. Air pollution has increased significantly in the last 25 years, and that's having health consequences especially in low- and middle-income countries, according to a new Global Burden of Disease (GBD) study published in The Lancet medical journal.[45] Researchers found that air pollution – specifically, the small particles measured as less than PM2.5 in microns – was the fifth leading risk factor for death in 2015, exceeded only by high blood pressure, smoking, and the metabolic causes of high blood sugars and cholesterol often associated with diet and lifestyle.[46]

This escalating adverse impact of air pollution is worrisome and does not only prove detrimental to human life, but also calls on the state to invoke its duty to its citizens; to preserve the fundamental human right to life and sustainable development. There may be no explicit reference to a 'right to sustainable development' in the 1992 Rio Declaration on Environment and Development, but Principle 3 endorses the 'right to development', but emphasizes that it 'should be fulfilled so as to meet equitably the developmental and

[45] Laureen Fagon, 'Air Pollution and the Impact on Public Health in Africa' (<https://africatimes.com/2017/04/19/air-pollution-and-the-impact-on-public-health-in-africa/>) (accessed 26 January 2020).
[46] Ibid.

environmental needs of present and future generations'.[47] In this sense, incorporating MARPOL Annex VI into the law of Namibia is a deliberate effort to regulate and curb ship source air pollution from further contributing to health risks, as well as to expressly invoke Namibia's state obligation towards the protection of the environment through empowering the legal implications of sustainable development.

The government of the Republic of Namibia has made it a distinctive priority, the protection of the environment by establishing it as a constitutional provision. This commitment is found in legislations such as the Environmental Management Act No. 7 of 2007, various legislations on Fisheries and Marine Resources, the long term national development goal; Vision 2030 and the National Development Plans, the Harambee Prosperity Plan, the Climate Change Policy, as well as the Climate Change Strategy and Action Plan. However, less had been produced on ship source air pollution control and legislation. Hence, MARPOL Annex VI comes as that important piece to complete the parcel on the well structured Namibian Environmental protection law and policy framework. Since Namibia has already ratified the MARPOL Convention and is now in the process to accede to Annex VI, Drafting this piece of legislation serves as a one-stop-shop for accession and implementation in Namibia.

3.1. Regional health concerns

Less is noted on the degree to which African nations, with their growing urban populations and climate challenges are confronted with air risks of particulate matter and ozone. Historically, a key problem in understanding air quality and its influence on public health in African nations has been the absence of reliable data. In a World Health Organization (WHO) study of 3,000 reporting stations released in 2016, there was just one reporting station in Uganda and Madagascar, a few in Tunisia, and slightly better coverage in Nigeria or South Africa.[48] A 2016 study found that a higher risk of heart diseases related to elevated PM2.5 exposure and corresponding increases in calcium deposits in the coronary arteries, while another found a 22 percent increase in the risk for high blood pressure among people living with higher PM 2.5 concentrations in the most

[47] Birnie, Boyle and Redgwell (n. 15) 115.
[48] Fagon (n. 45)

polluted areas.[49] The alarming nature of the atrocity of air pollution, which makes it a concern from all angles; whether national, regional, continental or international, is that it is transboundary.

High smokestacks plus increased pollution levels have turned a local problem into a transboundary one. It is now thought that certain pollutants in Europe and North America may remain airborne for several days and travel over a thousand kilometers before being deposited, and that spatial scale of these problems can range from hundreds of thousands to a million square kilometers.[50] This phenomenon alone distributes a shared spectrum of risks, atrocities, experiences and responsibilities among neighboring nations. Hence, there is a need for every state to establish proactive policies and legislations necessary to deal with the challenges in the region or the continent at large. The new GBD study notes that in the past 10 years, in addition to asthma and other respiratory illnesses, PM2.5 exposure is linked with type II diabetes, and preterm and low-weight births, suggesting that research evolves the public health implications of air pollution may expand further.[51] Consideration of the health related concerns of air pollution on the continent together with the transboundary nature of air pollution raises greater concern on the Namibian government to be proactive in its approach to dealing with air pollution and its devastating consequences. The catch is that transboundary air pollution can be related to the conventional classification of different scales of atmospheric transport, with a character somewhere between the meso - and synoptic scales. Therefore, from a technical point of view, transboundary air pollution is synoptic or mesoscale air pollution with a political aspect.[52] It is this aspect that is emphasized in the definition of "long-range transboundary air pollution" offered by the Economic Commission for Europe in the 1979 Geneva Convention: "…air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one state and which has adverse effects in the area under the jurisdiction of another state…".[53] Hence, within the framework of transboundary air pollution and as an explanatory concept to atmospheric transportation

[49] Ibid.
[50] Cees Flinterman, Barbara Kwiatkowska and Johan G. Lammers (eds), *Transboundary Air Pollution: International Legal Aspects of the Co-operation of States* (Martinus Nijhoff Publishers 1986) 1.
[51] Fagon (n. 45).
[52] Flinterman, Kwiatkowska and Lammers (eds) (n. 50) 2.
[53] Ibid.

of harmful pollutants, means that domestic challenges are shared by the region and vice versa.

One thing that one would be cautious about when it comes to the various studies conducted on the impact of air pollution on public health in Africa is the fact that science still doesn't know what, if any, variations exist in the health risks from different air pollution sources, thus initiatives need to include a range of sources, particularly ship source air pollution. While everything from wood stoves in Gaborone (Botswana) to e-waste recycling in Accra (Ghana) is understood as a climate or economic problem, or both, governments need to integrate their management practices and their citizens need to make the greater connection between associated toxic air and an evolving knowledge of its public health impacts.[54] It is against this background that MARPOL Annex VI would come in handy for Namibia, as an antidote to the insufficiency of legislation aimed at controlling the emissions causing these public health challenges in the interest of the Southern African region, the African continent and the world at large.

3.2. A compliment to existing environmental law and policy

The MARPOL Annex VI presents a distinct area of legislation that tries to strike the balance between industrial regulation and marine environmental protection, therefore falling well in place as a sustainable development oriented legislation. Namibia has established substantial laws geared towards the protection of the environment, but with none that possess the aspect of ship source air pollution. The duty to protect the environment has been on the forefront from the inception of the Constituent Assembly to the inception of the Namibian State on the 21st March 1990. According to Article 1(6) of the Namibian Constitution, the latter is the law above all laws. Therefore, all legislation ought to be consistent with the provisions of the constitution. Article 95(l) stipulates that "the state shall actively promote and maintain the welfare of the people by adopting policies which include the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for the benefit of all Namibians…"

[54] Laureen Fagon (n. 45).

Through this particular Article, Namibia is obliged to protect its environment and to promote a sustainable use of its natural resources.[55] It's the same Article upon which the Ministry of Environment and Tourism is established. Clearly, policy formulation and legislation on the environment in Namibia is not only a duty, but a responsibility of the state under the constitution. Hence, MARPOL Annex VI comes as no stranger, but a perfect complement to existing policy and legislative guidelines towards environmental protection.

The Environmental Management Act No. 7 of 2007 establishes guidelines for environmental management in Namibia, requires adherence to the principle of optimal sustainable yield in the exploitation of all natural resources, It promotes the coordinated and integrated management of the environment and sets out responsibilities in this regard. Writing on Environmental Law and Policy in Namibia, Oliver C. Ruppel goes further to state that it intends to give statutory effect to Namibia's Environmental Assessment Policy; and enables the minister responsible for the environment to give effect to Namibia's obligations under international environmental conventions; and provides for associated matters.[56]

Even though the implementation of MARPOL Annex VI will fall under the Maritime Administration, which falls under the Ministry of Works and Transport, it is a marine environmental based legislation supported by Article 95 (1) of the Namibian Constitution and implementable under the Draft Marine Pollution Bill of Namibia, 2010. Similar categories of laws in place include the Marine Resources Act No. 27 of 2000, which provides for the conservation of the marine ecosystem and the responsible utilisation, conservation, protection and promotion of marine resources on a sustainable basis; and the Pollution Control and Waste Management Bill, which is under enactment.

Unlike most of the environmental protection related legislations and policies, the MARPOL Convention provides a new spectrum to Namibian legislation; the fact that it is a maritime transport instrument, but covering marine environmental protection, while

[55] Oliver C. Ruppel & Katharina Ruppel-Schlichting, *Environmental Law and Policy in Namibia: Towards Making Africa the Tree of Life* (2nd edn, Hans Seidel Foundation & OrumbondePress.na 2013).
[56] Ibid., 106.

safeguarding the thrive of the maritime transport industrial development in conformity with environmental protection. Therefore, a strong complement for sustainable development related legislation and policy.

Justice, equity, fairness and necessity are the underlying principles of sustainability, one would say. Unsustainable things such as waste, fossil fuels, polluting ships, unhealthy food and so on, are unnecessary, unfair, inequitable or unjust. The air that we breathe, the water that we drink, the soils that our food comes from are essential to our survival, thus the basic rule of human existence is to sustain the conditions life depends on.[57] Clearly, sustainability is a fundamental principle of law as it is based on the duty to protect and restore the integrity of the Earth's ecological systems; and deals with the precautionary approach to human health and natural resources. Jared Diamond identified five factors contributing to the collapse of civilizations: climate change, hostile neighbors, trade partners, environmental problems and, finally, society's response to its environmental problems.[58]

Launched in June 2004 by the founding President and father of the Namibian nation, Dr. Sam Nujoma, Namibia's Vision 2030 is established on the rationale to provide long-term policy scenarios on the future course of development in the country at different points in time up until the target year of 2030.[59] Vision 2030 regards the sequential five-year National Development Plans (NDPs) as the main vehicles for achieving its long-term objectives. Taking from chapter five therein, the long-term aim of Vision 2030 is the availability of clean water, and productive and healthy natural wetlands with rich biodiversity.[60] Sustainable developments legislations and policies need to be implemented in order to be on par with the provisions of the Vision. Bringing MARPOL Annex VI on board will shape Namibian legislation and policy to be well in line with the United Nations Sustainable Development Goals (SDGS).

Since international shipping takes place on the world's oceans, and IMO is responsible

[57] Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Ashgate Publishing Limited 2008) 9.
[58] Ibid., 10.
[59] Ruppel & Ruppel-Schlichting (n. 55) 119.
[60] Ibid.

for measures to improve the safety and security of international shipping and to prevent pollution from ships, IMO's work is integral to SDG 14; and its objectives can be summarized as: safe, secure and efficient shipping on clean oceans.[61] The Namibia Climate Change Strategy and Action Plan was drafted in 2009 and provides a background to climate change impacts predicted globally, regionally and nationally, highlighting how vulnerable Namibia is in this regard and argues the need for climate change adaptation and mitigation.[62] The scope presented by MARPOL is relevant for the realization of the Climate Change Strategy and Action Plan. IMO's work to address climate change is also significant. Air pollution and greenhouse gas emissions from ships are regulated by MARPOL Annex VI.[63] It is against the above mentioned background that Namibia needs MARPOL Annex VI incorporated into law.

3.3. A one-stop-shop for accession and implementation

Namibia acceded to MARPOL and its two mandatory annexes (I and II) as well as two optional Annexes (III and V) in December 2002.[64] Annexes IV and VI have not been acceded to, hence they are in the process of enactment. This Draft thus becomes a one way ticket to champion the course of accession and also serve the purpose of implementation by virtue of incorporation. As indicated earlier, Annex VI is the main international treaty addressing air pollution prevention requirements from ships by setting limits on sulphur oxide (SOx) and nitrogen oxide (NOx) emissions from ships through engine-based and fuel-based standards. This presents great potential for a diversified and far reaching environmental legislation in Namibia, yet targeting an economically booming sector in the country, shipping.

The marine pollution risk profile of Namibia has experienced a major shift over the last ten years, mainly because of the growth and significance of the Port of Walvis Bay as a gateway to Southern Africa as well as Namibia's position as an attractive new frontier for oil and gas exploration.[65] These activities all present risks of ship-generated pollution in Namibian waters, across all six annexes of MARPOL, particularly for the purpose of this Draft; Annex VI. These new risk scenarios highlight the need for the existing legal framework to be strengthened in order to

[61] IMO, 'IMO and Sustainable Development*:* Sustainable Development Goals'.
[62] (n. 55) 129.
[63] IMO (n. 61).
[64] Government of the Republic of Namibia, Office of the Minister of Works and Transport: 'Secret Memorandum to Cabinet' (05 December 2018).
[65] Ibid.

effectively manage existing as well as new threats. This is particularly important because the entire Namibian coastline of 1570 km in length is classified as a national park and is endowed with important socio-economic and ecological resources, including three wetlands of international importance (Ramsar Sites) and the Namibian Islands Marine Protected Area (NIMPA).

As far as implementation is concerned, Namibia through the incorporation of the MARPOL Annex VI, invokes her jurisdictional rights to the protection and preservation of the marine environment under the contemporary rule of international maritime law. As it is generally accepted that jurisdiction is an aspect of sovereignty, State jurisdiction in relation to the protection and preservation of the marine environment denotes the competence of the State authorities under international law to regulate the activities of the State organs and private individuals, natural and juridical persons alike, in the marine domain.[66] Nonetheless, the text of the UN Convention on the Law of the Sea (UNCLOS) does not make reference to the traditional basis of jurisdiction; instead, the State operates in the UNCLOS context in the guise of the 'flag State', the 'coastal State', or the 'port State', with no particular cited definition.[67] Hence, Namibia will invoke her jurisdictional obligation as a flag State; to ensure compliance by ships to which she has granted nationality through the maintenance of the genuine link. Without prejudice to the traditional concession of the right to innocent passage, Namibia will uphold her jurisdictional obligation to protect her marine environment from all ships, local or foreign, sailing in her territorial sea and territorial waters by implementing the provisions of Annex VI. As a port State, Namibia will extend her jurisdiction to ships who have acquiesced to her jurisdiction by entering voluntarily into her ports, thus subjecting them to inspections in accordance to the provisions of Annex VI.

According to Cabinet Decision No. 2nd /19.02.19/003, the Cabinet of the Republic of Namibia approved in principle the accession to MARPOL Annexes IV and VI, and referred the matter to the Cabinet Committee on Legislation (CCL) for further scrutiny, before its tabling in the National Assembly for accession.[68] With this accession to Annex VI ongoing, drafting on incorporating the instrument into Namibia law will serve the process of incorporation that would have followed after the National Assembly passes the accession, thus serving as a one-stop- shop for accession and implementation. Acceding to the two annexes will also showcase Namibia as a leading advocate for environmental protection and contribute to the UN Sustainable Development Goals

[66] Maria Gavouneli, '*State Jurisdiction in Relation to the Protection and Preservation of the Marine Environment'* in David Joseph Attard et al. (eds), The *IMLI Manual on International Maritime Law (Vol. III) – Marine Environmental Law and Maritime Security Law* (Oxford University Press 2016) 5.
[67] Ibid., 6.
[68] Government of the Republic of Namibia, Office of the Prime Minister; Cabinet Secretariat, 'Cabinet Action Letter' (Decision No. 2nd/19.02.19/003).

(SDGs), particularly SDG 14 (life below water) and SDG 13 (climate action), while demonstrating Namibia's commitment to contributing to the universal coverage of IMO conventions in general and MARPOL in particular.

4. HOW TO INCORPORATE ANNEX VI INTO NAMIBIAN LEGISLATION

This section will briefly provide an overview of the accepted method of incorporating international conventions into domestic law in Namibia. It will further explore the legal instrument into which the MARPOL Annex VI can best be incorporated into the law of Namibia.

4.1. Incorporation of MARPOL Annex VI into Namibian legislation

Namibia mostly uses the dualist system when acceding to international Agreements that may warrant a diverse political consultation. MARPOL Annex VI will be incorporated into Namibian legislation using the dualist approach. This is evident to the fact that a Cabinet Committee on Legislation (CCL) had convened towards the end of 2019 to discuss Namibia's accession to Annex IV and VI. The recommendations of this Committee were passed to the Legal Drafters in the Office of the Attorney General in collaboration with the Directorate of Maritime Affairs so that a Draft Legislation can be established for tabling in the National Assembly. According to Oliver C. Ruppel, Article 144 of the Namibian Constitution incorporates international law explicitly as law of the land and it needs no legislative act to become so.[69] This implies that Namibia follows the monist approach of incorporation. However, there are conflicting approaches to the interpretation of Article 144. Proponents of the monist approach makes reference to Article 32(3) (e) of the Constitution, which empowers the President of Namibia to "negotiate and sign international agreements, and to delegate such power", in order to establish that whatever international Agreements and Conventions negotiated and signed by the President automatically becomes law in Namibia. On the other hand, defenders of the dualist approach site Article 63(2) (e) of the same Constitution which empowers the National Assembly (Parliament) to "agree to the ratification of or accession to international agreements which have been negotiated and signed in terms of Article 32(3) (e)" thereof. The approach widely used is the latter Article which empowers Parliament

[69] Ruppel & Ruppel-Schlichting (n. 55) 33.

to first agree to all negotiated and signed Agreements by the President. Thus in practice, treaties can only be binding on Namibia internationally once ratified or acceded to by the Namibian Parliament. One would hope for a reconciled interpretation of Article 144 with due cognizance to Article 27 of the Vienna Convention on the Law of Treaties of 1969.[70] International law has to conform to the Constitution in order to apply domestically. International agreements, therefore, will become Namibian law when they come into force for Namibia.

The best way to incorporate the MARPOL Annex VI in the Namibian legislation is through the 2010 Draft Marine Pollution Bill of Namibia. The aspect of Marine Pollution, particularly the incorporation of MARPOL was relocated from the Merchant Shipping Act, 1951 (Act No. 57 of 1951) to the new 2010 Draft Marine Pollution Bill of Namibia. While the Merchant Shipping Act remain the umbrella instrument governing Maritime Affairs in Namibia, the Draft Marine Pollution Bill was enacted mainly to incorporate MARPOL instruments without having to amend the 1951 Act. In fact, the Draft Marine Pollution Bill was enacted in accordance with the Merchant Shipping Act. According to section 356 (1) of the Merchant Shipping Act, the Minister is empowered with the discretion to make regulations necessary for the convenient and effective carrying out of the provisions of the Act.[71] The Marine Pollution Bill of Namibia tried to incorporate the mandatory Annexes of MARPOL, including Annexes IV and VI simultaneously with the accession procedure. However, regulations 12 to 18 of MARPOL Annex VI were strictly left at the Minister's discretion.

Section 187 of Division 7 under Chapter V of the Draft Marine Pollution Bill of Namibia reads as follows:

> The Minister shall make regulations for the following –
>
> (1) Regulations for control of emissions from ship covering the following:-
>
> (a) Ozone-depleting substances;
>
> (b) Nitrogen Oxides (NO_x);

[70] See Article 27 of the VCLT, 1969 which stipulate that a party may not invoke provisions of its internal law as justification for its failure to perform a treaty.
[71] Republic of Namibia, 'Merchant Shipping Act, 1951' (Act No. 57 of 1951).

(c) Sulphur oxides (SO_x); and particulate matter

(d) Volatile organic compounds; (VOCs)

(e) Shipboard incineration; and

(f) Fuel oil; availability and quality

(g) Trials for ship emission reduction and control technology

(h) Emission from seabed mineral activities

(2) Provision of reception facilities.[72]

Thus, Serving as a separate Ministerial Amendment Regulation, this Draft will incorporate the outstanding regulations left out in the 2010 Draft Marine Pollution Bill of Namibia; incorporating Regulations 12 to 25 of the MARPOL Annex VI respectively, in accordance with Section 187 of the 2010 Draft Marine Pollution Bill; and Section 356 (1) of the Merchant Shipping Act, 1951 (Act No. 57 of 1951) that gives the Minister power to make Regulations for the convenient and effective carrying out of the provisions of the Act.

4.2 Brief Explanation of the Draft Law

This legislation is prepared in reference to the 2010 Draft Marine Pollution Bill of Namibia due to the fact that it was decided that all marine pollution and MARPOL related legislations will be moved from the Merchant Shipping Act where they are scattered and outdated, and then organized under one Marine Pollution Act. Hence, the legislation would be promulgated under the auspice of the Marine Pollution Act of Namibia, 2010; as soon as the said Bill becomes an Act. This was necessary to compartmentalize legislations and establish an organized legal framework with a focus to attract inputs for possible amendments and for the ease of application.

[72] Republic of Namibia, Ministry of Works & Transport; 'Draft Marine Pollution Bill of Namibia 2010'.

Preamble

REGULATIONS MADE IN TERMS OF

Merchant Shipping Act 57 of 1951

Section 356 & The

Draft Marine Pollution Bill, 2010

Section 187

Citation and commencement

Merchant Shipping

(Prevention of Air Pollution) Regulations

Government Notice XXX of 2020
(GG XXXX)

came into force on date of publication: XXX

ARRANGEMENT OF REGULATIONS

PART I
GENERAL PROVISIONS

1. Interpretation

(1) In these regulations, unless the context otherwise requires—

"A similar stage of construction" means the stage at which construction identifiable with a specific ship begins; and assembly of that ship has commenced comprising at least 50 tons or one per cent of the estimated mass of all structural material, whichever is less;

"Anniversary date" means the day and the month of each year that will correspond to the date of expiry of the International Air Pollution Prevention Certificate;

"Attained EEDI" is the Energy Efficiency Design Index value achieved by an individual ship in accordance with Part IV;

"Auxiliary control device" means a system, function, or control strategy installed on a marine diesel engine that is used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure, or that is used to facilitate the starting of the engine. An auxiliary control device may also be a strategy or measure that has been satisfactorily demonstrated not to be a defeat device;

"Calendar year" means the period from 1 January until 31 December inclusive;

"Certificate" means the International Prevention of Air Pollution Certificate or International Energy Efficiency Certificate, or both, whichever these regulations apply to the ship;

"Company" means the owner of a ship or, any other entity or person such as the ashore manager or bareboat charterer who has assumed responsibility for the operation of the ship from the owner of the ship and who on assuming such responsibility has agreed to take over all duties and responsibilities relating to the safe operation of the ship;

"Continuous feeding" is defined as the process whereby waste is fed into a combustion chamber without human assistance while the incinerator is in normal operating conditions with the combustion chamber operative temperature between 850°C and 1,200°C;

"Convention" means Annex VI of the Protocol of 1997 to the Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) as amended;

"Conventional propulsion" in relation to Part V of these regulations means a method of propulsion where a main reciprocating internal combustion engine(s) is the prime mover and coupled to a propulsion shaft either directly or through a gear box;

"Defeat device" means a device which measures, senses, or responds to operating variables (engine speed, temperature, intake pressure or any other parameter) for the purpose of activating, modulating, delaying or deactivating the operation of any component or the function of the emission control system, such that the effectiveness of the emission control system is reduced under conditions encountered during normal operation, unless the use of such a device is substantially included in the applied emission certification test procedures;

"the Act" means Namibia Maritime Authority Act;

"Authority" means Namibia Maritime Authority established under the Namibian Authority Act;

"Chief Executive Officer" means the person appointed under the Namibian Authority Act;

"Distance travelled" means ship's distance travelled over ground;

"Emission" means any release of substances, subject to control by these regulations, from ships into the atmosphere or sea;

"Existing ship" means a ship which is not a new ship;

"Fuel oil" means any fuel delivered to and intended for combustion purposes for propulsion or operation on board a ship, including gas, distillate and residual fuels;

"Major Conversion" means in relation to Part V a conversion of a ship─

a) which substantially alters the dimensions, carrying capacity or engine power of the ship; or

b) which changes the type of the ship; or

c) the intent of which in the opinion of the Authority is substantial to prolong the life of the ship;

d) 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

e) which substantially alters the energy efficiency of the ship and includes any modifications that could cause the ship to exceed the applicable required EEDI;

"Marine diesel engine" means any reciprocating internal combustion engine operating on liquid or dual fuel, to which Part II of these regulations applies, including booster/compound systems if applied. In addition, a gas fuelled engine installed on a ship constructed on or after 1 March 2016 or a gas fuelled additional or non-identical replacement engine installed on or after that date is also considered as a marine diesel engine;

"New ship" means a ship─

a) for which the building contract is placed on or after 1 January 2013; or

b) 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

c) the delivery of which is on or after 1 July 2015;

"Non-conventional propulsion" in relation to Part V of these regulations means a method of propulsion, other than conventional propulsion, including diesel-electric propulsion, turbine propulsion, and hybrid propulsion systems;

"NOx Technical Code 2008" is the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines derived from International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) adopted by Conference resolution 2;

"IMO" means the International Maritime Organization;

"Required EEDI" is the maximum value of attained EEDI that is allowed by Regulation 21 of Part IV for the specific ship type and size;

"SEEMP" means the Ship Energy Efficiency Management Plan;

"Statement" means the Statement of Compliance for fuel oil consumption reporting;

"Shipboard incinerator" means a shipboard facility designed for the primary purpose of incineration;

"Ships constructed" means ships the keels of which are laid or that are at a similar stage of construction;

"Sludge oil" means sludge from the fuel oil or lubricating oil separators, waste lubricating oil from main or auxiliary machinery, or waste oil from bilge water separators, oil filtering equipment or drip trays;

(2) For the purpose of these regulations, other references shall be made herewith the Ordinance, Schedules, or the related international conventions, as it may deem fit by the Director of Marine.

2. Application

(1) These regulations shall, unless the context otherwise requires, apply to all ships.

(2) These regulations shall not, unless the context otherwise requires, apply to—

a) government and war ships; and

b) pleasure crafts.

3. Exceptions

(1) These regulations shall not apply to—

a) any emission necessary for the purpose of securing the safety of a ship or saving life at sea; or

b) any emission resulting from damage to a ship or its equipment, provided that all reasonable precautions have been taken after the occurrence of the damage or discovery of the emission for the purpose of preventing or minimizing the emission; and except if the owner or the master acted either with intent to cause damage, or recklessly and with knowledge that damage would probably result.

(2) The Authority may exempt, or waive, any criteria from Part II or V of these regulations, as it deems fit for the conditions of the ship as follows:

a) conducting trials for ship emission reduction and control technology research; or

b) emissions from sea-bed mineral activities; or

c) restricted operation within one domestic port.

4. Equivalents

(1) The Director of Marine may allow any fitting, material, appliance or apparatus to be fitted in a ship or other procedures, alternative fuel oils, or compliance methods used as an alternative to that required by these regulations if such fitting, material, appliance or apparatus or

other procedures; alternative fuel oils, or compliance methods are at least as effective in terms of emissions reductions as that required by these regulations, including any of the standards set forth in Part II and V.

PART II
REQUIREMENTS OF CONTROL OF EMISSIONS FROM SHIPS

5. Ozone-depleting substances

(1) This regulation does not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components containing ozone- depleting substances.

(2) Subject to the provisions of Regulation 3(1), any deliberate emissions of ozone-depleting substances shall be prohibited. Deliberate emissions include emissions occurring in the course of maintaining, servicing, repairing or disposing of systems or equipment, except that deliberate emissions do not include minimal releases associated with the recapture or recycling of an ozone-depleting substance. Emissions' arising from deliberate leaks of an ozone- depleting substance is an offence.

(3) Installations that contain ozone-depleting substances:

a) other than hydro-chlorofluorocarbons, shall be prohibited for—

i. on ships constructed on or after 19 May 2005; or

ii. in the case of ships constructed before 19 May 2005, which have a contractual delivery date of the equipment to the ship on or after 19 May 2005 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 19 May 2005.

b) Installations which contain hydro-chlorofluorocarbons shall be prohibited—

i. on ships constructed on or after 1 January 2020; or

ii. in the case of ships constructed before 1 January 2020, which have a contractual delivery date of the equipment to the ship on or after 1 January 2020 or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship on or after 1 January 2020.

(4) The substances referred to in this regulation, and equipment containing such substances, shall be delivered to appropriate reception facilities when removed from ships.

(5) Each ship subject to Section 180 of the Draft Marine Pollution Bill shall maintain a list of equipment containing ozone- depleting substances.

(6) Each ship subject to Section 180 of the Draft Marine Pollution Bill that has rechargeable systems that contain ozone- depleting substances shall maintain an ozone-depleting substances record book. This record book may form part of an existing log-book or electronic recording system as approved by the Authority.

(7) Entries in the ozone-depleting substances record book shall be recorded in terms of mass (kilogram) of substance and shall be completed without delay on each occasion, in respect of the following:

(a) recharge, full or partial, of equipment containing ozone-depleting substances;

(b) repair or maintenance of equipment containing ozone-depleting substances;

(c) discharge of ozone-depleting substances to the atmosphere whether deliberate or non-deliberate;

(d) discharge of ozone-depleting substances to land-based reception facilities; and

(e) supply of ozone-depleting substances to the ship.

6. Nitrogen Oxides (NOx)

Application

(1) The application of this Regulation is as follows:

(a) This regulation shall apply to—

i. each marine diesel engine with a power output of more than 130 kW installed on a ship; and
ii. each marine diesel engine with a power output of more than 130 kW that undergoes a major conversion on or after 1 January 2000 except when demonstrated to the satisfaction of the Authority that such engine is an identical replacement to the engine that it is replacing and is otherwise not covered under sub regulation 1(a) (i).

b) This regulation does not apply to—

i. a marine diesel engine intended to be used solely for emergencies, or solely to power any device or equipment intended to be used solely for emergencies on

the ship on which it is installed, or a marine diesel engine installed in lifeboats intended to be used solely for emergencies; and

ii. a marine diesel engine installed on a Namibian ship exclusively engaged in voyages within Namibian waters, provided that such engine is subject to an alternative NOx control measure established by the Authority.

c) Notwithstanding the provisions of sub regulation (1) (a), the Authority may provide an exclusion from the application of this regulation for any marine diesel engine that is installed on a ship constructed, or for any marine diesel engine that undergoes a major conversion, before 19 May 2005, provided that the Namibian ship on which the engine is installed is exclusively engaged in voyages to ports or offshore terminals within Namibian waters.

Major Conversion

(2) For the purpose of major conversion of this Regulation:

a) Major conversion means a modification on or after 1 January 2000 of a marine diesel engine that has not already been certified to the standards set forth in sub regulation (3), (4), or (5)(a)(i) where─

i. the engine is replaced by a marine diesel engine or an additional marine diesel engine is installed, or

ii. any substantial modification, as defined in the revised NOx Technical Code 2008, is made to the engine, or

iii. the maximum continuous rating of the engine is increased by more than 10% compared to the maximum continuous rating of the original certification of the engine.

b) A marine diesel engine referred to in sub regulation (2)(a)(ii) or (2)(a)(iii) shall meet the following standards:

i. for ships constructed prior to 1 January 2000, the standards set forth in sub regulation (3) shall apply; and
ii. for ships constructed on or after 1 January 2000, the standards in force at the time the ship was constructed shall apply.

Tier I

(3) Subject to Regulation 3, the operation of a marine diesel engine that is installed on

a ship constructed on or after 1 January 2000 and prior to 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

a) 17.0 g/kWh when n is less than 130 rpm;

b) 45·n(-0.2) g/kWh when n is 130 or more but less than 2,000 rpm;

c) 9.8 g/kWh when n is 2,000 rpm or more.

Tier II

(4) Subject to Regulation 3, the operation of a marine diesel engine that is installed on a ship constructed on or after 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

a) 14.4 g/kWh when n is less than 130 rpm;
b) 44 · n(-0.23) g/kWh when n is 130 or more but less than 2,000 rpm;
c) 7.7 g/kWh when n is 2,000 rpm or more.

Tier III

(5) Subject to Regulation 3, in an emission control area designated for Tier III NOX control under sub regulation 6 (NOx Tier III emission control area), the operation of a marine diesel engine that is installed on a ship:

a) is prohibited except when the emission of nitrogen oxides (calculated as the total weighted emission of NO2) from the engine is within the following limits, where *n* = rated engine speed (crankshaft revolutions per minute):

i. 3.4 g/kWh when *n* is less than 130 rpm;

ii. 9 · *n* (–0.2) g/kWh when *n* is 130 or more but less than 2,000 rpm;

iii. 2.0 g/kWh when *n* is 2,000 rpm or more;

b) When that ship is constructed on or after—

i. 1 January 2016 and is operating in the North American Emission Control Area or the United States Caribbean Sea Emission Control Area;
ii. 1 January 2021 and is operating in the Baltic Sea Emission Control Area or the North Sea Emission Control Area;

c) When that ship is operating in a NOx Tier III emission control area, other than an emission control area described in sub regulation 5(b), and is constructed on or after the date of adoption of such an emission control area, or a later date as may be specified in the amendment designating the NOX Tier III emission control area, whichever is later.

d) The standards set forth in sub regulation 5(a) shall not apply to—

i. a marine diesel engine installed on a ship with a length of less than 24 meters when it has been specifically designed, and is used solely, for recreational purposes; or

ii. a marine diesel engine installed on a ship with a combined nameplate diesel engine propulsion power of less than 750 kW if it is demonstrated, to the satisfaction of the Authority, that the ship cannot comply with the standards set forth in sub regulation 5(a) because of design or construction limitations of the ship; or

iii. a marine diesel engine installed on a ship constructed prior to 1 January 2021 of less than 500 gross tonnage, with a length of 24 meters or over when it has been specifically designed, and is used solely, for recreational purposes.

e) The tier and on/off status of marine diesel engines installed on board a ship to which sub regulation 5(a) applies which are certified to both Tier II and Tier III or which are certified to Tier II only shall be recorded in such logbook as prescribed by the Authority at entry into and exit from a NOx Tier III emission control area, or when the on/off status changes within such an area, together with the date, time and position of the ship.

f) Emissions of nitrogen oxides from a marine diesel engine subject to sub regulation 5(a) that occur immediately following building and sea trials of a newly constructed ship, or before and following converting, repairing, and/or maintaining the ship, or maintenance or repair of a Tier II engine or a dual fuel engine when the ship is required to not have gas fuel or gas cargo on board due to safety requirements, for which activities take place in a shipyard or other repair facility located in a NOX Tier III emission control area are temporarily exempted provided the following conditions are met:

i. the engine meets the Tier II NOX limits; and

ii. the ship sails directly to or from the shipyard or other repair facility, does not load or unload cargo during the duration of the exemption, and follows any additional specific routing requirements indicated by the port State in which the

shipyard or other repair facility is located, if applicable.

g) The exemption described in sub regulation 5(f) of this regulation applies only for the following period:

i. for a newly constructed ship, the period beginning at the time the ship is delivered from the shipyard, including sea trials, and ending at the time the ship directly exits the NOX Tier III emission control area(s) or, with regard to a ship fitted with a dual fuel engine, the ship directly exits the NOX Tier III emission control area(s) or proceeds directly to the nearest gas fuel bunkering facility appropriate to the ship located in the NOX Tier III emission control area(s);

ii. for a ship with a Tier II engine undergoing conversion, maintenance or repair, the period beginning at the time the ship enters the NOX Tier III emission control area(s) and proceeds directly to the shipyard or other repair facility, and ending at the time the ship is released from the shipyard or other repair facility and directly exits the NOX Tier III emission control area (s) after performing sea trials, if applicable; or

iii. for a ship with a dual fuel engine undergoing conversion, maintenance or repair, when the ship is required to not have gas fuel or gas cargo on board due to safety requirements, the period beginning at the time the ship enters the NOX Tier III emission control area(s) or when it is degassed in the NOX Tier III emission control area(s) and proceeds directly to the shipyard or other repair facility, and ending at the time when the ship is released from the shipyard or other repair facility and directly exits the NOX Tier III emission control area(s) or proceeds directly to the nearest gas fuel bunkering facility appropriate to the ship located in the NOX Tier III emission control area(s).

Emission Control Area

(6) For the purposes of this regulation, a NOX Tier III emission control area shall be any sea area, including any port area, designated by the IMO. The NOX Tier III emission control areas are:

a) the North American Emission Control Area, which means the area described by the coordinates provided in Fourth Schedule;

b) the United States Caribbean Sea Emission Control Area, which means the area described by the coordinates provided in Fourth Schedule;

c) the Baltic Sea Emission Control Area as defined in Convention;

d) the North Sea Emission Control Area as defined in Convention.

Marine Diesel Engines Installed on a Ship Constructed Prior to 1 January 2000

(7) Notwithstanding sub regulation 1(a)(i), a marine diesel engine with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 liters installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 shall comply with the emission limits set forth in sub regulation 7(d), provided that an approved method for that engine has been certified by Director of Marine:

a) Compliance with sub regulation (7) shall be demonstrated through one of the following:

i. installation of the certified approved method, as confirmed by a survey using the verification procedure specified in the approved method file, including appropriate notation on the ship's International Air Pollution Prevention Certificate of the presence of the approved method; or

ii. certification of the engine confirming that it operates within the limits set forth in sub regulation (3), (4), or (5)(a)(i) and an appropriate notation of the engine certification on the ship's International Air Pollution Prevention Certificate.

b) Sub regulation (7)(a) shall apply no later than the first renewal survey that occurs 12 months or more after deposit of the notification in sub regulation (7)(a). If a ship-owner of a ship on which an approved method is to be installed can demonstrate to the satisfaction of the Authority that the approved method was not commercially available despite best efforts to obtain it, then that approved method shall be installed on the ship no later than the next annual survey of that ship which falls after the approved method is commercially available.

c) With regard to a marine diesel engine with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 liters installed on a ship constructed on or after 1 January 1990, but prior to 1 January 2000, the International Air Pollution Prevention Certificate shall, for a marine diesel engine to which these regulations 7.1 of this regulation applies, indicate one of the following:

i. an approved method has been applied pursuant to sub regulation (7)(a)(i);
ii. the engine has been certified pursuant to sub regulation (7)(a)(i);
iii. an approved method is not yet commercially available as described in sub regulation (7)(b); or
iv. an approved method is not applicable.

d) Subject to Regulation 3, the operation of a marine diesel engine described in sub regulation (7)(a) is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

i. 17.0 g/kWh when n is less than 130 rpm;

ii. 45 · n(-0.2) g/kWh when n is 130 or more but less than 2,000 rpm; and

iii. 9.8 g/kWh when n is 2,000 rpm or more.

e) Certification of an approved method shall be in accordance with chapter 7 of the revised NOx Technical Code 2008 and shall include verification:

i. by the designer of the base marine diesel engine to which the approved method applies that the calculated effect of the approved method will not decrease engine rating by more than 1.0%, increase fuel consumption by more than 2.0% as measured according to the appropriate test cycle set forth in the revised NOx Technical Code 2008, or adversely affect engine durability or reliability; and

ii. that the cost of the approved method is not excessive, which is determined by a comparison of the amount of NOx reduced by the approved method to achieve the standard set forth in sub regulation (7)(d) and the cost of purchasing and installing such approved method.

Certification

(8) The revised NOx Technical Code 2008 shall be applied in the certification, testing, and measurement procedures for the standards set forth in this regulation, of the normal operation of the engine.

(9) Defeat devices and irrational emission control strategies undermine this intention and shall not be allowed. The use of auxiliary control devices that are used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure or that are used to facilitate the starting of the engine, are allowed.

7. Sulphur Oxides (SOx) and Particulate Matter (PM)

General Requirements

(1) The sulphur content of any fuel oil used on board ships shall not exceed the following limits:

(a) 3.50% m/m on and after 1 January 2012; and

(b) 0.50% m/m on and after 1 January 2020.

(2) The Company, master, and fuel oil supplier to the ship, shall ensure sub regulation (1) is in compliance at all-time following the current date.

Requirements within emission control areas

(3) For the purpose of this regulation, emission control areas as described by the coordinates or areas, in the Convention shall include:

a) the Baltic Sea and the North Sea;

b) the North American area;

c) the United States Caribbean Sea; and

d) any other sea area, including any port area, as designated by the IMO.

(4) While ships are operating within an emission control area, the sulphur content of fuel oil used on board ships shall not exceed the following limits:

a) 0.10% m/m on and after 1 January 2015;

b) Prior to 1 January 2020, the sulphur content of fuel oil referred to in sub regulation (4) shall not apply to ships operating in the North American area or the United States Caribbean Sea area defined in sub regulation (3), built on or before 1 August 2011 that are powered by propulsion boilers that were not originally designed for continued operation on marine distillate fuel or natural gas.

(5) The sulphur content of fuel oil referred to in sub regulation (1) and (4) shall be properly documented by its supplier as required by Regulation 11.

(6) Those ships using separate fuel oils to comply with sub regulation (4) and entering or leaving an emission control area set forth in sub regulation (3) shall carry a written procedure showing how the fuel oil change-over is to be done, allowing sufficient time for the fuel oil service system to be fully flushed of all fuel oils exceeding the applicable sulphur content specified in sub regulation (4) prior to entry into an emission control area. The volume of low sulphur fuel oils in each tank as well as the date, time, and position of the ship when any fuel- oil-change-over operation is completed prior to the entry into

an emission control area or commenced after exit from such an area, shall be recorded in such log-book as prescribed by the Director of Marine.

(7) During the first twelve months immediately following entry into force of an amendment designating a specific emission control area under sub regulation (3), ships operating in that emission control area are exempt from the requirements in sub regulation (4) and (6) and from the requirements of sub regulation (5) insofar as they relate to sub regulation (4).

8. Volatile Organic Compounds (VOC)

(1) A tanker carrying crude oil shall have on board and implement a VOC management plan approved by the Director of Marine. The plan shall be specific to each ship and shall at least:

a) provide written procedures for minimizing VOC emissions during the loading, sea passage and discharge of cargo;

b) record on additional VOC generated by crude oil washing;

c) identify a person responsible for implementing the plan; and

d) for ships on international voyages, at least be written or translated in English language.

9. Shipboard Incineration

(1) Except as provided in sub regulation (4), shipboard incineration shall be allowed only in a shipboard incinerator.

(2) Shipboard incineration of the following substances shall be prohibited:

a) residues of cargoes or related contaminated packing materials as described in Convention;

b) polychlorinated biphenyls (PCBs);

c) garbage, as defined by Convention, containing more than traces of heavy metals;

d) refined petroleum products containing halogen compounds;

e) sewage sludge and sludge oil either of which are not generated on board the ship; and

f) exhaust gas cleaning system residues.

(3) Shipboard incineration of polyvinyl chlorides (PVCs) is prohibited, except in shipboard incinerator for which IMO's type-approved certified.

(4) Shipboard incineration of sewage sludge and sludge oil generated during normal operation of a ship may also take place in the main or auxiliary power plant or boilers, but in those cases, shall not take place inside ports, harbors and estuaries.

(5) Except as provided in sub regulation (6), each incinerator on a ship constructed on or after 1 January 2000 or incinerator that is installed on board a ship on or after 1 January 2000 shall meet the requirements contained in Fifth Schedule. Each incinerator subject to this paragraph shall be approved by the Authority; or

(6) The Authority may allow exclusion from the application of sub regulation (5) to any incinerator that is installed on board a Namibian ship before 19 May 2005, provided that the ship is exclusively engaged in voyages within Namibian waters.

(7) Incinerators installed in accordance with the requirements of sub regulation (6) of this regulation shall be provided with a manufacturer's operating manual which is to be retained with the unit and which shall specify how to operate the incinerator within the limits described in sub regulation (2) of Fifth Schedule.

(8) Personnel responsible for the operation of an incinerator installed in accordance with the requirements of sub regulation (5) shall be trained to implement the guidance provided in the manufacturer's operating manual as required by sub regulation (7) of this regulation.

(9) For incinerators installed in accordance with the requirements of sub regulation (5) of this regulation the combustion chamber gas outlet temperature shall be monitored at all times the unit is in operation. Where that incinerator is of the continuous-feed type, waste shall not be fed into the unit when the combustion chamber gas outlet temperature is below 850°C. Where that incinerator is of the batch-loaded type, the unit shall be designed so that the combustion chamber gas outlet temperature shall reach 600°C within five minutes after start-up and will thereafter stabilize at a temperature not less than 850°C.

10. Reception Facilities

(1) All reception facilities in Malaysia, if any, shall operate its services, and incorporated in its operational procedure, according to any domestic law and these regulations.

11. Fuel Oil Availability and Quality

Fuel Oil Availability

(1) The Authority is entitled to require any ship to—

a) present a record of the actions taken to attempt to achieve compliance; and

b) provide evidence that it attempted to purchase compliant fuel oil in accordance with its voyage plan and, if it was not made available where planned, that attempts were made to locate alternative sources for such fuel oil and that despite best efforts to obtain compliant fuel oil, no such fuel oil was made available for purchase.

(2) The ship should not be required to deviate from its intended voyage or to delay unduly the voyage after in conforming sub regulation (1)(b). A ship shall immediately notify the Authority and the competent authority of the relevant port of destination when it cannot purchase compliant fuel oil.

Fuel Oil Quality

(3) Fuel oil for combustion purposes delivered to and used on board ships to which these regulations applies shall meet the following requirements:

a) except as provided in sub regulation 3(b):

i. the fuel oil shall be blends of hydrocarbons derived from petroleum refining. This shall not preclude the incorporation of small amounts of additives intended to improve some aspects of performance;

ii. the fuel oil shall be free from inorganic acid; and

iii. the fuel oil shall not include any added substance or chemical waste that jeopardizes the safety of ships or adversely affects the performance of the machinery, or is harmful to personnel, or contributes overall to additional air pollution.

b) fuel oil for combustion purposes derived by methods other than petroleum refining shall not—

i. exceed the applicable sulphur content set forth in Regulation 7;

ii. cause an engine to exceed the applicable NOx emission limit set forth in sub regulation (3), (4), (5)(a)(i) and 7(d) of Regulation 6;

iii. contain inorganic acid, or jeopardize the safety of ships or adversely affect the performance of the machinery, or be harmful to personnel, or contribute overall

to additional air pollution.

(4) This regulation does not apply to coal in its solid form or nuclear fuels. Sub regulation (5), (6), (7), and (8) do not apply to gas fuels such as liquefied natural gas, compressed natural gas or liquefied petroleum gas. The sulphur content of gas fuels delivered to a ship specifically for combustion purposes on board that ship shall be documented by the supplier.

(5) For each ship subject to Section 177 and 178 of the Draft Marine Pollution Bill, details of fuel oil for combustion purposes delivered to and used on board shall be recorded by means of a bunker delivery note which shall contain at least the information specified in Sixth Schedule.

(6) The bunker delivery note shall be kept on board the ship in such a place as to be readily available for inspection at all reasonable times. It shall be retained for a period of three years after the fuel oil has been delivered on board.

(7) The nominated officials or authorized organizations may inspect the bunker delivery notes on board any ship to which these regulations apply while the ship is in its port or offshore terminal, may make a copy of each delivery note, and may require the master or person in charge of the ship to certify that each copy is a true copy of such bunker delivery note.

(8) The bunker delivery note shall be accompanied by a representative sample of the fuel oil delivered. The sample is to be sealed and signed by the supplier's representative and the master or officer in charge of the bunker operation on completion of bunkering operations and retained under the ship's control until the fuel oil is substantially consumed, but in any case for a period of not less than 12 months from the time of delivery.

(9) The Authority may require at any time for the sample as in sub regulation (8) be analysed.

PART III
ENERGY EFFICIENCY FOR SHIPS

12. Application: Ship Energy Efficiency

(1) The regulation of Part IV shall apply to all ships of 400 gross tonnage and above.

(2) This regulation may not apply to—

a) Namibian ships exclusively engaged in voyages within Namibian waters.
b) ships not propelled by mechanical means, and platforms including FPSOs and

FSUs and drilling rigs, regardless of their propulsion.

(3) Regulation 13 and 14 shall not apply to ships which—

a) have non-conventional propulsion, except that Regulation 13 and 14 shall apply to cruise passenger ships having non-conventional propulsion and LNG carriers having conventional or non-conventional propulsion; or

b) delivered on or after 1 September 2019; or

c) cargo ships having ice-breaking capability.

(4) Notwithstanding the provisions of sub regulation (1), the Director of Marine may waive the requirement for a ship of 400 gross tonnage and above from complying with regulation 13 and regulation 14 subject to application and justification by the Company.

(5) The provision of sub regulation (4) shall not apply to ships of 400 gross tonnage and above:

a) for which the building contract is placed on or after 1 January 2017; or

b) 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 2017; or

c) the delivery of which is on or after 1 July 2019; or

d) in cases of a major conversion of a new or existing ship, on or after 1 January 2017, and in which Section 177 of the Draft Marine Pollution Bill apply.

13. Attained Energy Efficiency Design Index (Attained EEDI)

(1) The attained EEDI shall be calculated for—

a) each new ship;

b) each new ship which has undergone a major conversion; and

c) each new or existing ship which has undergone a major conversion, that is so extensive that the ship is regarded by the Authority as a newly constructed ship, which falls into one or more of the categories in Seventh Schedule. The attained EEDI shall be specific to each ship and shall indicate the estimated performance of the ship in terms of energy efficiency, and be accompanied by the EEDI technical file that contains the information necessary for the calculation of the attained EEDI and that shows the process of calculation. The attained EEDI

shall be verified, based on the EEDI technical file, either by the Authority or by any organization duly authorized.

(2) The attained EEDI shall be calculated taking into account guidelines developed by the IMO.

14. Required EEDI

(1) Required EEDI applied for—

a) new ship;

b) new ship which has undergone a major conversion; and

c) new or existing ship which has undergone a major conversion that is so extensive that the ship is regarded by the Authority as a newly constructed ship, which falls into one of the categories in Seventh Schedule and to which this regulation is applicable, the attained EEDI shall be as follows:

i. Attained EEDI ≤ Required EEDI = (1-X/100) x reference line value; and

ii. where X is the reduction factor specified in table 1 for the required EEDI compared to the EEDI reference line.

(2) For each new and existing ship that has undergone a major conversion which is so extensive that the ship is regarded by the Authority as a newly constructed ship, the attained EEDI shall be calculated and meet the requirement of sub regulation (1) with the reduction factor applicable corresponding to the ship type and size of the converted ship at the date of the contract of the conversion, or in the absence of a contract, the commencement date of the conversion.

(3) The Reference line values shall be calculated as described in Seventh Schedule.

(4) If the design of a ship allows it to fall into more than one of the ship type definitions specified in Seventh Schedule, the required EEDI for the ship shall be the most stringent (the lowest) required EEDI.

(5) For each ship to which this regulation applies, the installed propulsion power shall not be less than the propulsion power needed to maintain the maneuverability of the ship under adverse conditions as defined in the guidelines to be developed by the IMO.

15. Ship Energy Efficiency Management Plan (SEEMP)

(1) Each ship shall keep on board a ship specific Ship Energy Efficiency Management Plan (SEEMP). This may form part of the ship's Safety Management System (SMS).

(2) In the case of a ship of 5,000 gross tonnage and above, the SEEMP shall include a description of the methodology that will be used to collect the data required by Regulation 16. The data for applicable Malaysia ship to be reported to the Director of Marine by the Company.

(3) The SEEMP shall be developed based on latest guidelines by the IMO.

16. Collection and Reporting of Ship Fuel Oil Consumption Data

(1) From calendar year 2019, each ship of 5,000 gross tonnage and above shall collect the data specified in Eighth Schedule, for that and each subsequent calendar year or portion thereof, as appropriate, according to the methodology included in the SEEMP.

(2) Except as provided for in sub regulation (4), (5) and (6), at the end of each calendar year, the ship shall aggregate the data collected in that calendar year or portion thereof, as appropriate.

(3) Except as provided for in sub regulation (4), (5) and (6), within three months after the end of each calendar year, the ship shall report to the Authority or any organization duly authorized, the aggregated value for each datum specified in Eighth Schedule via electronic communication and using a standardized format as developed by the IMO.

(4) In the event of the transfer of a ship from Namibian flag to another, the ship shall within the period of 14 days before or after the day of completion of the transfer report to the Director of Marine or any organization duly authorized, the aggregated data for the period of the calendar year corresponding as Namibian flag, as specified in Eighth Schedule, upon prior request of Authority, the disaggregated data.

(5) In the event of a change from one Company to another, the ship shall within the period of 14 days before or after the day of completion of the change report to the Authority or any organization duly authorized, the aggregated data for the period of the calendar year corresponding as to the Company, as specified in Eighth Schedule, upon prior request of the Authority, the disaggregated data.

(6) In the event of change from Namibian flag to another and from one Company to another concurrently, sub regulation (4) shall apply.

(7) The data shall be verified according to the procedures established by the Authority, taking into account guidelines developed by the IMO.

(8) Except as provided for in sub regulation (4), (5) and (6), the disaggregated data that underlies the reported data noted in Eighth Schedule for the previous calendar year shall be readily accessible for a period of not less than 12 months from the end of that calendar year and be made available to the Authority upon request.

PART IV
INSPECTIONS AND OFFENCES

17. Inspection

(1) Any ship, when in a port or an offshore terminal under Namibian water, is subject to inspection by officers duly authorized by the Authority concerning operational requirements either under these regulations or the Convention, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of air pollution from ships.

(2) In the circumstances given in sub regulation (1), the ship shall not sail until the situation has been brought to order in accordance with the requirements of the Convention.

(3) The appointed officers may request the master or Company to furnish further or better evidence of the alleged contravention. If the appointed officers are satisfied after further inquiry, or further investigation, that sufficient evidence is available to enable proceedings to be brought in respect of the alleged violation, it shall cause such proceedings to be taken in accordance with Namibian law as soon as possible.

(4) Nothing in this regulation shall be construed to limit the rights and obligations of the Authority carrying out control over operational requirements specifically provided for in the present Convention.

(5) In relation to Part III, any inspection shall be limited to verifying, when appropriate, that there is at least a valid Statement of Compliance related to fuel oil consumption reporting and International Energy Efficiency Certificate on board, as related.

(6) After such inspection, a ship must not proceed to sea from a Namibian port unless—

a) the International Air Pollution Prevention in respect of that ship is valid,

b) the International Energy Efficiency Certificate in respect of that ship is valid,

c) the Statement of Compliance in respect of that ship is reasonably updated in accordance to the ship's operational activity, and

d) the surveyor or authorized officers duly appointed by the Authority has permitted the ship to proceed to sea without presenting an unreasonable threat of harm to the marine environment in fulfillment of any provisions stated in these regulations of Part II and Part III.

18. Offence

(1) The Authority may revoke an appropriate certificate or statement issued in respect of a Namibian ship to which these regulations apply, where he has reason to believe that—

a) the appropriate certificate was issued on false or erroneous information; or

b) since the completion of any survey or verification required by these Regulations, absence of any required record or, equipment or machinery has sustained damaged, or otherwise found deficient.

(2) Any person, Master, or Company who contravenes any provisions of these regulations shall be guilty of an offence, where no other penalty is provided, be liable on conviction to a fine not exceeding fifty thousand ringgit or to imprisonment for a term not exceeding one year or to both.

FIRST SCHEDULE

REPUBLIC OF NAMIBIA

INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE

Issued under the provisions of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and as amended by resolution MEPC.132(53), (hereinafter referred to as ''the Convention'') under the authority of the Government of:

. . . . . .

(Full designation of the country)

by. . . . . .

(Full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship*

Name of ship . . . . . .

Distinctive number or letters . . . . . .

Port of registry . . . . . .

Gross tonnage . . . . . .

IMO Number[1] . . . . . .

* Alternatively, the particulars of the ship may be placed horizontally in boxes.

{ In accordance with IMO ship identification number scheme adopted by the Organization by resolution A.600(15).

3

Type of ship:

tanker &

ship other than a tanker &

THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with regulation 5 of Annex VI of the Convention; and

2 That the survey shows that the equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of Annex VI of the Convention.

Completion date of survey on which this Certificate is based:. . . . .(dd/mm/yyyy)

This Certificate is valid until . . . .* subject to surveys in accordance with regulation 5 of Annex VI of the Convention.

Issued at. . . . .

(Place of issue of certificate)

(dd/mm/yyyy): . . . .

(Date of issue) *(Signature of authorized official issuing the certificate)*

(Seal or stamp of the authority, as appropriate)

* Insert the date of expiry as specified by the Administration in accordance with regulation 9(1) of Annex VI of the Convention. The day and the month of this date correspond to the anniversary date as defined in regulation 2(14) of Annex VI of the Convention, unless amended in accordance with regulation 9(8) of Annex VI of the Convention.

Endorsement for annual and intermediate surveys

THIS IS TO CERTIFY that at a survey required by regulation 5 of Annex VI of the Convention the ship was found to comply with the relevant provisions of the Convention:

Annual survey: Signed:. . . . . .
(signature of authorized official)
Place: . . . . . .
Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate* survey: Signed:. . . . . .
(signature of authorized official)
Place: . . . . . .
Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate* survey: Signed:. . . . . .
(signature of authorized official)
Place: . . . . . .
Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Annual survey: Signed:. . . . . .
(signature of authorized official)
Place: . . . . . .
Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

* Delete as appropriate.

Annual/intermediate survey in accordance with regulation 9(8)(c)

THIS IS TO CERTIFY that, at an annual/intermediate* survey in accordance with regulation 9(8)(c) of Annex VI of the Convention, the ship was found to comply with the relevant provisions of the Convention:

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Endorsement to extend the certificate if valid for less than 5 years where regulation 9(3) applies

The ship complies with the relevant provisions of the Convention, and this certificate shall, in accordance with regulation 9(3) of Annex VI of the Convention, be accepted as valid until (dd/mm/yyyy): . . . . . .

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Endorsement where the renewal survey has been completed and regulation 9(4) applies

The ship complies with the relevant provisions of the Convention, and this certificate shall, in accordance with regulation 9(4) of Annex VI of the Convention, be accepted as valid until (dd/mm/yyyy): . . . . . .

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

* Delete as appropriate.

Endorsement to extend the validity of the certificate until reaching the port of survey or for a period of grace where regulation 9(5) or 9(6) applies

This certificate shall, in accordance with regulation 9(5) or 9(6)* of Annex VI of the Convention, be accepted as valid until (dd/mm/yyyy): . . . . . .

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

Endorsement for advancement of anniversary date where regulation 9(8) applies

In accordance with regulation 9(8) of Annex VI of the Convention, the new anniversary date is (dd/mm/yyyy):. . . . . .

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

In accordance with regulation 9(8) of Annex VI of the Convention, the new anniversary date is (dd/mm/yyyy):. . . . . .

Signed:. . . . . .
(signature of authorized official)

Place: . . . . . .

Date (dd/mm/yyyy):. . . . . .

(Seal or stamp of the authority, as appropriate)

* Delete as appropriate.

SUPPLEMENT TO
INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE
(IAPP CERTIFICATE)

RECORD OF CONSTRUCTION AND EQUIPMENT

In respect of the provisions of Annex VI of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (hereinafter referred to as ''the Convention'').

Notes:

1 This Record shall be permanently attached to the IAPP Certificate. The IAPP Certificate shall be available on board the ship at all times.

2 The Record shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.

3 Entries in boxes shall be made by inserting either a cross (*x*) for the answer ''yes'' and ''applicable'' or a (–) for the answers ''no'' and ''not applicable'' as appropriate.

4 Unless otherwise stated, regulations mentioned in this Record refer to regulations of Annex VI of the Convention and resolutions or circulars refer to those adopted by the International Maritime Organization.

1 Particulars of ship

1.1 Name of ship . . . . . .

1.2 Distinctive number or letters . . . . . .

1.3 IMO number . . . . . .

1.4 Port of registry . . . . . .

1.5 Gross tonnage . . . . . .

1.6 Date on which keel was laid or ship was at a similar stage of construction . . . . . .

1.7 Date of commencement of major engine conversion (if applicable) (regulation 13): . . . . . .

2 Control of emissions from ships

2.1 *Ozone-depleting substances (regulation 12)*

2.1.1 The following fire-extinguishing systems and equipment containing halons may continue in service: . . . . . &

System equipment	Location on board

2.1.2 The following systems and equipment containing CFCs may continue in service: . . . . . &

System equipment	Location on board

2.1.3 The following systems containing hydro-chlorofluorocarbons (HCFCs) installed before 1 January 2020 may continue in service: . . . . . &

System equipment	Location on board

2.2 *Nitrogen oxides (NO_x) (regulation 13)*

2.2.1 The following diesel engines with power output greater than 130 kW, and installed on a ship constructed on or after 1 January 2000, comply with the emission standards of regulation 13(3)(a) in accordance with the NO_x Technical Code: . . . . . &

Manufacturer and model	Serial number	Use	Power output (kW)	Rated speed (rpm)

2.2.2 The following diesel engines with power output greater than 130 kW, and which underwent major conversion per regulation 13(2) on or after 1 January 2000, comply with the emission standards of regulation 13(3)(a) in accordance with the NO_x Technical Code:. . . . . &

Manufacturer and model	Serial number	Use	Power output (kW)	Rated speed (rpm)

2.2.3 The following diesel engines with a power output greater than 130 kW and installed on a ship constructed on or after 1 January 2000, or with a power output greater than 130 kW and which underwent major conversion per regulation 13(2) on or after 1 January 2000, are fitted with an exhaust gas cleaning system or other equivalent methods in accordance with regulation 13(3), and the NO_x Technical Code: . . . . . &

Manufacturer and model	Serial number	Use	Power output (kW)	Rated speed (rpm)

2.2.4 The following diesel engines from 2.2.1, 2.2.2 and 2.2.3 above are fitted with NO_x emission monitoring and recording devices in accordance with the NO_x Technical Code: . . . . . &

Manufacturer and model	Serial number	Use	Power output (kW)	Rated speed (rpm)

2.3 *Sulphur oxides (SO_x) (regulation 14)*

2.3.1 When the ship operates within an SO_x emission control area specified in regulation 14(3), the ship uses:

.1 fuel oil with a sulphur content that does not exceed 1.5% m/m as documented by bunker delivery notes; or &

.2 an approved exhaust gas cleaning system to reduce SO_x emissions below 6.0 g SO_x/kW·h; or &

.3 other approved technology to reduce SO_x emissions below 6.0 g SO_x/kW·h &

2.4 *Volatile organic compounds (VOCs) (regulation 15)*

2.4.1 The tanker has a vapour collection system installed and approved in accordance with MSC/Circ.585 &

2.5 The ship has an incinerator:

.1 which complies with resolution MEPC.76(40) as amended &

.2 installed before 1 January 2000 which does not comply with resolution MEPC.76(40) as amended &

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at . . . .

(Place of issue of the Record)

(dd/mm/yyyy): . . . .

Date of issue *(Signature of duly authorized official issuing the Record)*

(Seal or stamp of the authority, as appropriate)

SECOND SCHEDULE

IEEC : XXXX/20XX/XXXX

REPUBLIC OF NAMIBIA

INTERNATIONAL ENERGY EFFICIENCY CERTIFICATE

Issued under the provisions of the Protocol of 1997, as amended by resolution MEPC.203(62), to amend the International Convention for the Prevention of Pollution by Ships, 1973, as modified by the Protocol of 1978 related thereto (hereinafter referred to as "the Convention") under the authority of the Government of:

NAMIBIA

By **Deputy Director: Surveys & Inspections**

Particulars of ship

Name of ship	**<ship name>**
Distinctive number or letters	**<official number>**
Port of registry	**<port of registry>**
Gross tonnage	**<gross tonnage>**
IMO Number	**<IMO number>**

THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with regulation 5.4 of Annex VI of the Convention; and

2 That the survey shows that the ship complies with the applicable requirements in regulation 22.

Completion date of survey on which this Certificate is based: **<day> <month> <year>**

Issued at **Port Walvis Bay** on **<day> <month> <year>**

(**<signature's name>**)
Deputy Director: Surveys
& Inspections

IEEC : XXXX/20XX/XXXX

REPUBLIC OF NAMIBIA

Supplement to the International Energy Efficiency Certificate (IEE Certificate)

RECORD OF CONSTRUCTION RELATING TO ENERGY EFFICIENCY

Notes:

1 This Record shall be permanently attached to the IEE Certificate. The IEE Certificate shall be available on board the ship at all times.

2 The Record shall be at least in English, French or Spanish. If an official language of the issuing Party is also used, this shall prevail in case of a dispute or discrepancy.

3 Entries in boxes shall be made by inserting either: a cross (x) for the answers "yes" and "applicable"; or a dash (-) for the answers "no" and "not applicable", as appropriate.

4 Unless otherwise stated, regulations mentioned in this Record refer to regulations in Annex VI of the Convention, and resolutions or circulars refer to those adopted by the International Maritime Organization.

1 Particulars of ship

1.1	Name of ship	**<ship name>**
1.2	IMO number	**<IMO number>**
1.3	Date of **<building contract/keel laid>**	**<day> <month> <year>**
1.4	Gross tonnage	**<gross tonnage>**
1.5	Deadweight	**<deadweight>**
1.6	Type of ship	**<ship type>**

2 Propulsion system

2.1 Diesel propulsion ..... ☐

2.2 Diesel-electric propulsion ..... ☐

2.3 Turbine propulsion ..... ☐

2.4 Hybrid propulsion ..... ☐

2.5 Propulsion system other than any of the above ..... ☐

3 Attained Energy Efficiency Design Index (EEDI)

3.1 The Attained EEDI in accordance with regulation 20.1 is calculated based on the information contained in the EEDI technical file which also shows the process of calculating the Attained EEDI……..... ☐

The Attained EEDI is: grams-CO2/tonne-mile

3.2 The Attained EEDI is not calculated as:

3.2.1 the ship is exempt under regulation 20.1 as it is not a new ship as defined in regulation 2.23 ..... ☐

3.2.2 the type of propulsion system is exempt in accordance with regulation 19.3 ..... ☐

3.2.3 the requirement of regulation 20 is waived by the ship's Administration in accordance with regulation 19.4 ..... ☐

3.2.4 the type of ship is exempt in accordance with regulation 20.1 ..... ☐

4 Required EEDI

4.1 Required EEDI is: grams-CO2/tonne-mile

4.2 The required EEDI is not applicable as:

4.2.1 the ship is exempt under regulation 21.1 as it is not a new ship as defined in regulation 2.23 ..... ☐

4.2.2 the type of propulsion system is exempt in accordance with regulation 19.3 ..... ☐

4.2.3 the requirement of regulation 21 is waived by the ship's Administration in accordance with regulation 19.4 ..... ☐

4.2.4 the type of ship is exempt in accordance with regulation 21.1 ..... ☐

4.2.5 the ship's capacity is below the minimum capacity threshold in Table 1 of regulation 21.2 ..... ☐

IEEC : XXXX/20XX/XXXX

5 Ship Energy Efficiency Management Plan

5.1 The ship is provided with a Ship Energy Efficiency Management Plan (SEEMP) in compliance with regulation 22 ..... ☐

6 EEDI technical file

6.1 The IEE Certificate is accompanied by the EEDI technical file in compliance with regulation 20.1 ..... ☐

6.2 The EEDI technical file identification/verification number .....

6.3 The EEDI technical file verification date .....

****

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at **Port Walvis Bay**

<day> <month> <year>

(**<signature's name>**)
Deputy Director: Surveys
& Inspections

THIRD SCHEDULE

SOC: XXXX/20XX/XXXX

REPUBLIC OF NAMIBIA

STATEMENT OF COMPLIANCE

Issued under the provisions of the Protocol of 1997, as amended, to amend the International Convention for the Prevention of Pollution by Ships, 1973, as modified by the Protocol of 1978 related thereto (hereinafter referred to as "the Convention") under the authority of the Government of:

NAMIBIA

By **Deputy Director: Surveys & Inspections**

Particulars of ship

Name of ship	**<ship name>**
Distinctive number or letters	**<official number>**
IMO Number	**<IMO number>**
Port of registry	**<Port of Registry>**
Gross tonnage	**<gross tonnage>**

THIS IS TO DECLARE:

1 That the ship has submitted to this Administration the data required by regulation 22A of Annex VI of the Convention, covering ship operations from *(dd/mm/yyyy)* through *(dd/mm/yyyy); and*

2 The data was collected and reported in accordance with the methodology and processes set out in the ship's SEEMP that was in effect over the period from *(dd/mm/yyyy)* through *(dd/mm/yyyy).*

This Statement of Compliance is valid until: **<day> <month> <year>**

Issued at **Port Walvis Bay**

Date **<day> <month> <year>**

(**<name>**)
Deputy Director:
Surveys & Inspections

FOURTH SCHEDULE

EMISSION CONTROL AREA

1. The boundaries of emission control areas designated under Convention, other than the Baltic Sea and the North Sea areas, are set forth in this appendix.

2. The North American area comprises:

a) the sea area located off the Pacific coasts of the United States and Canada, enclosed by geodesic lines connecting the following coordinates:

POINT	LATITUDE	LONGITUDE
1	32º 32′ 10″ N.	117º 06′ 11″ W.
2	32º 32′ 04″ N.	117º 07′ 29″ W.
3	32º 31′ 39″ N.	117º 14′ 20″ W.
4	32º 33′ 13″ N.	117º 15′ 50″ W.
5	32º 34′ 21″ N.	117º 22′ 01″ W.
6	32º 35′ 23″ N.	117º 27′ 53″ W.
7	32º 37′ 38″ N.	117º 49′ 34″ W.
8	31º 07′ 59″ N.	118º 36′ 21″ W.
9	30º 33′ 25″ N.	121º 47′ 29″ W.
10	31º 46′ 11″ N.	123º 17′ 22″ W.
11	32º 21′ 58″ N.	123º 50′ 44″ W.
12	32º 56′ 39″ N.	124º 11′ 47″ W.
13	33º 40′ 12″ N.	124º 27′ 15″ W.
14	34º 31′ 28″ N.	125º 16′ 52″ W.
15	35º 14′ 38″ N.	125º 43′ 23″ W.
16	35º 43′ 60″ N.	126º 18′ 53″ W.
17	36º 16′ 25″ N.	126º 45′ 30″ W.
18	37º 01′ 35″ N.	127º 07′ 18″ W.
19	37º 45′ 39″ N.	127º 38′ 02″ W.
20	38º 25′ 08″ N.	127º 52′ 60″ W.
21	39º 25′ 05″ N.	128º 31′ 23″ W.
22	40º 18′ 47″ N.	128º 45′ 46″ W.
23	41º 13′ 39″ N.	128º 40′ 22″ W.
24	42º 12′ 49″ N.	129º 00′ 38″ W.
25	42º 47′ 34″ N.	129º 05′ 42″ W.
26	43º 26′ 22″ N.	129º 01′ 26″ W.
27	44º 24′ 43″ N.	128º 41′ 23″ W.
28	45º 30′ 43″ N.	128º 40′ 02″ W.

29	46º 11′ 01″ N.	128º 49′ 01″ W.
30	46º 33′ 55″ N.	129º 04′ 29″ W.
31	47º 39′ 55″ N.	131º 15′ 41″ W.
32	48º 32′ 32″ N.	132º 41′ 00″ W.
33	48º 57′ 47″ N.	133º 14′ 47″ W.
34	49º 22′ 39″ N.	134º 15′ 51″ W.
35	50º 01′ 52″ N.	135º 19′ 01″ W.
36	51º 03′ 18″ N.	136º 45′ 45″ W.
37	51º 54′ 04″ N.	137º 41′ 54″ W.
38	52º 45′ 12″ N.	138º 20′ 14″ W.
39	53º 29′ 20″ N.	138º 40′ 36″ W.
40	53º 40′ 39″ N.	138º 48′ 53″ W.
41	54º 13′ 45″ N.	139º 32′ 38″ W.
42	54º 39′ 25″ N.	139º 56′ 19″ W.
43	55º 20′ 18″ N.	140º 55′ 45″ W.
44	56º 07′ 12″ N.	141º 36′ 18″ W.
45	56º 28′ 32″ N.	142º 17′ 19″ W.
46	56º 37′ 19″ N.	142º 48′ 57″ W.
47	58º 51′ 04″ N.	153º 15′ 03″ W.

b) the sea areas located off the Atlantic coasts of the United States, Canada, and France (Saint-Pierre-et-Miquelon) and the Gulf of Mexico coast of the United States enclosed by geodesic lines connecting the following coordinates:

POINT	**LATITUDE**	**LONGITUDE**
1	60º 00′ 00″ N.	64º 09′ 36″ W.
2	60º 00′ 00″ N.	56º 43′ 00″ W.
3	58º 54′ 01″ N.	55º 38′ 05″ W.
4	57º 50′ 52″ N.	55º 03′ 47″ W.
5	57º 35′ 13″ N.	54º 00′ 59″ W.
6	57º 14′ 20″ N.	53º 07′ 58″ W.
7	56º 48′ 09″ N.	52º 23′ 29″ W.
8	56º 18′ 13″ N.	51º 49′ 42″ W.
9	54º 23′ 21″ N.	50º 17′ 44″ W.
10	53º 44′ 54″ N.	50º 07′ 17″ W.
11	53º 04′ 59″ N.	50º 10′ 05″ W.

12	52º 20′ 06″ N.	49º 57′ 09″ W.
13	51º 34′ 20″ N.	48º 52′ 45″ W.
14	50º 40′ 15″ N.	48º 16′ 04″ W.
15	50º 02′ 28″ N.	48º 07′ 03″ W.
16	49º 24′ 03″ N.	48º 09′ 35″ W.
17	48º 39′ 22″ N.	47º 55′ 17″ W.
18	47º 24′ 25″ N.	47º 46′ 56″ W.
19	46º 35′ 12″ N.	48º 00′ 54″ W.
20	45º 19′ 45″ N.	48º 43′ 28″ W.
21	44º 43′ 38″ N.	49º 16′ 50″ W.
22	44º 16′ 38″ N.	49º 51′ 23″ W.
23	43º 53′ 15″ N.	50º 34′ 01″ W.
24	43º 36′ 06″ N.	51º 20′ 41″ W.
25	43º 23′ 59″ N.	52º 17′ 22″ W.
26	43º 19′ 50″ N.	53º 20′ 13″ W.
27	43º 21′ 14″ N.	54º 09′ 20″ W.
28	43º 29′ 41″ N.	55º 07′ 41″ W.
29	42º 40′ 12″ N.	55º 31′ 44″ W.
30	41º 58′ 19″ N.	56º 09′ 34″ W.
31	41º 20′ 21″ N.	57º 05′ 13″ W.
32	40º 55′ 34″ N.	58º 02′ 55″ W.
33	40º 41′ 38″ N.	59º 05′ 18″ W.
34	40º 38′ 33″ N.	60º 12′ 20″ W.
35	40º 45′ 46″ N.	61º 14′ 03″ W.
36	41º 04′ 52″ N.	62º 17′ 49″ W.
37	40º 36′ 55″ N.	63º 10′ 49″ W.
38	40º 17′ 32″ N.	64º 08′ 37″ W.
39	40º 07′ 46″ N.	64º 59′ 31″ W.
40	40º 05′ 44″ N.	65º 53′ 07″ W.
41	39º 58′ 05″ N.	65º 59′ 51″ W.
42	39º 28′ 24″ N.	66º 21′ 14″ W.
43	39º 01′ 54″ N.	66º 48′ 33″ W.
44	38º 39′ 16″ N.	67º 20′ 59″ W.
45	38º 19′ 20″ N.	68º 02′ 01″ W.
46	38º 05′ 29″ N.	68º 46′ 55″ W.
47	37º 58′ 14″ N.	69º 34′ 07″ W.
48	37º 57′ 47″ N.	70º 24′ 09″ W.

49	37º 52′ 46″ N.	70º 37′ 50″ W.
50	37º 18′ 37″ N.	71º 08′ 33″ W.
51	36º 32′ 25″ N.	71º 33′ 59″ W.
52	35º 34′ 58″ N.	71º 26′ 02″ W.
53	34º 33′ 10″ N.	71º 37′ 04″ W.
54	33º 54′ 49″ N.	71º 52′ 35″ W.
55	33º 19′ 23″ N.	72º 17′ 12″ W.
56	32º 45′ 31″ N.	72º 54′ 05″ W.
57	31º 55′ 13″ N.	74º 12′ 02″ W.
58	31º 27′ 14″ N.	75º 15′ 20″ W.
59	31º 03′ 16″ N.	75º 51′ 18″ W.
60	30º 45′ 42″ N.	76º 31′ 38″ W.
61	30º 12′ 48″ N.	77º 18′ 29″ W.
62	29º 25′ 17″ N.	76º 56′ 42″ W.
63	28º 36′ 59″ N.	76º 47′ 60″ W.
64	28º 17′ 13″ N.	76º 40′ 10″ W.
65	28º 17′ 12″ N.	79º 11′ 23″ W.
66	27º 52′ 56″ N.	79º 28′ 35″ W.
67	27º 26′ 01″ N.	79º 31′ 38″ W.
68	27º 16′ 13″ N.	79º 34′ 18″ W.
69	27º 11′ 54″ N.	79º 34′ 56″ W.
70	27º 05′ 59″ N.	79º 35′ 19″ W.
71	27º 00′ 28″ N.	79º 35′ 17″ W.
72	26º 55′ 16″ N.	79º 34′ 39″ W.
73	26º 53′ 58″ N.	79º 34′ 27″ W.
74	26º 45′ 46″ N.	79º 32′ 41″ W.
75	26º 44′ 30″ N.	79º 32′ 23″ W.
76	26º 43′ 40″ N.	79º 32′ 20″ W.
77	26º 41′ 12″ N.	79º 32′ 01″ W.
78	26º 38′ 13″ N.	79º 31′ 32″ W.
79	26º 36′ 30″ N.	79º 31′ 06″ W.
80	26º 35′ 21″ N.	79º 30′ 50″ W.
81	26º 34′ 51″ N.	79º 30′ 46″ W.
82	26º 34′ 11″ N.	79º 30′ 38″ W.
83	26º 31′ 12″ N.	79º 30′ 15″ W.
84	26º 29′ 05″ N.	79º 29′ 53″ W.
85	26º 25′ 31″ N.	79º 29′ 58″ W.

86	26º 23′ 29″ N.	79º 29′ 55″ W.
87	26º 23′ 21″ N.	79º 29′ 54″ W.
88	26º 18′ 57″ N.	79º 31′ 55″ W.
89	26º 15′ 26″ N.	79º 33′ 17″ W.
90	26º 15′ 13″ N.	79º 33′ 23″ W.
91	26º 08′ 09″ N.	79º 35′ 53″ W.
92	26º 07′ 47″ N.	79º 36′ 09″ W.
93	26º 06′ 59″ N.	79º 36′ 35″ W.
94	26º 02′ 52″ N.	79º 38′ 22″ W.
95	25º 59′ 30″ N.	79º 40′ 03″ W.
96	25º 59′ 16″ N.	79º 40′ 08″ W.
97	25º 57′ 48″ N.	79º 40′ 38″ W.
98	25º 56′ 18″ N.	79º 41′ 06″ W.
99	25º 54′ 04″ N.	79º 41′ 38″ W.
100	25º 53′ 24″ N.	79º 41′ 46″ W.
101	25º 51′ 54″ N.	79º 41′ 59″ W.
102	25º 49′ 33″ N.	79º 42′ 16″ W.
103	25º 48′ 24″ N.	79º 42′ 23″ W.
104	25º 48′ 20″ N.	79º 42′ 24″ W.
105	25º 46′ 26″ N.	79º 42′ 44″ W.
106	25º 46′ 16″ N.	79º 42′ 45″ W.
107	25º 43′ 40″ N.	79º 42′ 59″ W.
108	25º 42′ 31″ N.	79º 42′ 48″ W.
109	25º 40′ 37″ N.	79º 42′ 27″ W.
110	25º 37′ 24″ N.	79º 42′ 27″ W.
111	25º 37′ 08″ N.	79º 42′ 27″ W.
112	25º 31′ 03″ N.	79º 42′ 12″ W.
113	25º 27′ 59″ N.	79º 42′ 11″ W.
114	25º 24′ 04″ N.	79º 42′ 12″ W.
115	25º 22′ 21″ N.	79º 42′ 20″ W.
116	25º 21′ 29″ N.	79º 42′ 08″ W.
117	25º 16′ 52″ N.	79º 41′ 24″ W.
118	25º 15′ 57″ N.	79º 41′ 31″ W.
119	25º 10′ 39″ N.	79º 41′ 31″ W.
120	25º 09′ 51″ N.	79º 41′ 36″ W.
121	25º 09′ 03″ N.	79º 41′ 45″ W.
122	25º 03′ 55″ N.	79º 42′ 29″ W.

123	25º 02′ 60″ N.	79º 42′ 56″ W.
124	25º 00′ 30″ N.	79º 44′ 05″ W.
125	24º 59′ 03″ N.	79º 44′ 48″ W.
126	24º 55′ 28″ N.	79º 45′ 57″ W.
127	24º 44′ 18″ N.	79º 49′ 24″ W.
128	24º 43′ 04″ N.	79º 49′ 38″ W.
129	24º 42′ 36″ N.	79º 50′ 50″ W.
130	24º 41′ 47″ N.	79º 52′ 57″ W.
131	24º 38′ 32″ N.	79º 59′ 58″ W.
132	24º 36′ 27″ N.	80º 03′ 51″ W.
133	24º 33′ 18″ N.	80º 12′ 43″ W.
134	24º 33′ 05″ N.	80º 13′ 21″ W.
135	24º 32′ 13″ N.	80º 15′ 16″ W.
136	24º 31′ 27″ N.	80º 16′ 55″ W.
137	24º 30′ 57″ N.	80º 17′ 47″ W.
138	24º 30′ 14″ N.	80º 19′ 21″ W.
139	24º 30′ 06″ N.	80º 19′ 44″ W.
140	24º 29′ 38″ N.	80º 21′ 05″ W.
141	24º 28′ 18″ N.	80º 24′ 35″ W.
142	24º 28′ 06″ N.	80º 25′ 10″ W.
143	24º 27′ 23″ N.	80º 27′ 20″ W.
144	24º 26′ 30″ N.	80º 29′ 30″ W.
145	24º 25′ 07″ N.	80º 32′ 22″ W.
146	24º 23′ 30″ N.	80º 36′ 09″ W.
147	24º 22′ 33″ N.	80º 38′ 56″ W.
148	24º 22′ 07″ N.	80º 39′ 51″ W.
149	24º 19′ 31″ N.	80º 45′ 21″ W.
150	24º 19′ 16″ N.	80º 45′ 47″ W.
151	24º 18′ 38″ N.	80º 46′ 49″ W.
152	24º 18′ 35″ N.	80º 46′ 54″ W.
153	24º 09′ 51″ N.	80º 59′ 47″ W.
154	24º 09′ 48″ N.	80º 59′ 51″ W.
155	24º 08′ 58″ N.	81º 01′ 07″ W.
156	24º 08′ 30″ N.	81º 01′ 51″ W.
157	24º 08′ 26″ N.	81º 01′ 57″ W.
158	24º 07′ 28″ N.	81º 03′ 06″ W.
159	24º 02′ 20″ N.	81º 09′ 05″ W.

160	23º 59′ 60″ N.	81º 11′ 16″ W.
161	23º 55′ 32″ N.	81º 12′ 55″ W.
162	23º 53′ 52″ N.	81º 19′ 43″ W.
163	23º 50′ 52″ N.	81º 29′ 59″ W.
164	23º 50′ 02″ N.	81º 39′ 59″ W.
165	23º 49′ 05″ N.	81º 49′ 59″ W.
166	23º 49′ 05″ N.	82º 00′ 11″ W.
167	23º 49′ 42″ N.	82º 09′ 59″ W
168	23º 51′ 14″ N.	82º 24′ 59″ W.
169	23º 51′ 14″ N.	82º 39′ 59″ W.
170	23º 49′ 42″ N.	82º 48′ 53″ W.
171	23º 49′ 32″ N.	82º 51′ 11″ W.
172	23º 49′ 24″ N.	82º 59′ 59″ W.
173	23º 49′ 52″ N.	83º 14′ 59″ W.
174	23º 51′ 22″ N.	83º 25′ 49″ W.
175	23º 52′ 27″ N.	83º 33′ 01″ W.
176	23º 54′ 04″ N.	83º 41′ 35″ W.
177	23º 55′ 47″ N.	83º 48′ 11″ W.
178	23º 58′ 38″ N.	83º 59′ 59″ W.
179	24º 09′ 37″ N.	84º 29′ 27″ W.
180	24º 13′ 20″ N.	84º 38′ 39″ W.
181	24º 16′ 41″ N.	84º 46′ 07″ W.
182	24º 23′ 30″ N.	84º 59′ 59″ W.
183	24º 26′ 37″ N.	85º 06′ 19″ W.
184	24º 38′ 57″ N.	85º 31′ 54″ W.
185	24º 44′ 17″ N.	85º 43′ 11″ W.
186	24º 53′ 57″ N.	85º 59′ 59″ W.
187	25º 10′ 44″ N.	86º 30′ 07″ W.
188	25º 43′ 15″ N.	86º 21′ 14″ W.
189	26º 13′ 13″ N.	86º 06′ 45″ W.
190	26º 27′ 22″ N.	86º 13′ 15″ W.
191	26º 33′ 46″ N.	86º 37′ 07″ W.
192	26º 01′ 24″ N.	87º 29′ 35″ W.
193	25º 42′ 25″ N.	88º 33′ 00″ W.
194	25º 46′ 54″ N.	90º 29′ 41″ W.
195	25º 44′ 39″ N.	90º 47′ 05″ W.
196	25º 51′ 43″ N.	91º 52′ 50″ W.

197	26º 17′ 44″ N.	93º 03′ 59″ W.
198	25º 59′ 55″ N.	93º 33′ 52″ W.
199	26º 00′ 32″ N.	95º 39′ 27″ W.
200	26º 00′ 33″ N.	96º 48′ 30″ W.
201	25º 58′ 32″ N.	96º 55′ 28″ W.
202	25º 58′ 15″ N.	96º 58′ 41″ W.
203	25º 57′ 58″ N.	97º 01′ 54″ W.
204	25º 57′ 41″ N.	97º 05′ 08″ W.
205	25º 57′ 24″ N.	97º 08′ 21″ W.
206	25º 57′ 24″ N.	97º 08′ 47″ W.

c) the sea area located off the coasts of the Hawaiian Islands of Hawai´i, Maui, Oahu, Moloka´i, Ni´ihau, Kaua´i, Lāna´i, and Kaho´olawe, enclosed by geodesic lines connecting the following coordinates:

POINT	LATITUDE	LONGITUDE
1	22º 32′ 54″ N.	153º 00′ 33″ W.
2	23º 06′ 05″ N.	153º 28′ 36″ W.
3	23º 32′ 11″ N.	154º 02′ 12″ W.
4	23º 51′ 47″ N.	154º 36′ 48″ W.
5	24º 21′ 49″ N.	155º 51′ 13″ W.
6	24º 41′ 47″ N.	156º 27′ 27″ W.
7	24º 57′ 33″ N.	157º 22′ 17″ W.
8	25º 13′ 41″ N.	157º 54′ 13″ W.
9	25º 25′ 31″ N.	158º 30′ 36″ W.
10	25º 31′ 19″ N.	159º 09′ 47″ W.
11	25º 30′ 31″ N.	159º 54′ 21″ W.
12	25º 21′ 53″ N.	160º 39′ 53″ W.
13	25º 00′ 06″ N.	161º 38′ 33″ W.
14	24º 40′ 49″ N.	162º 13′ 13″ W.
15	24º 15′ 53″ N.	162º 43′ 08″ W.
16	23º 40′ 50″ N.	163º 13′ 00″ W.
17	23º 03′ 20″ N.	163º 32′ 58″ W.
18	22º 20′ 09″ N.	163º 44′ 41″ W.
19	21º 36′ 45″ N.	163º 46′ 03″ W.
20	20º 55′ 26″ N.	163º 37′ 44″ W.

21	20º 13′ 34″ N.	163º 19′ 13″ W.
22	19º 39′ 03″ N.	162º 53′ 48″ W.
23	19º 09′ 43″ N.	162º 20′ 35″ W.
24	18º 39′ 16″ N.	161º 19′ 14″ W.
25	18º 30′ 31″ N.	160º 38′ 30″ W.
26	18º 29′ 31″ N.	159º 56′ 17″ W.
27	18º 10′ 41″ N.	159º 14′ 08″ W.
28	17º 31′ 17″ N.	158º 56′ 55″ W.
29	16º 54′ 06″ N.	158º 30′ 29″ W.
30	16º 25′ 49″ N.	157º 59′ 25″ W.
31	15º 59′ 57″ N.	157º 17′ 35″ W.
32	15º 40′ 37″ N.	156º 21′ 06″ W.
33	15º 37′ 36″ N.	155º 22′ 16″ W.
34	15º 43′ 46″ N.	154º 46′ 37″ W.
35	15º 55′ 32″ N.	154º 13′ 05″ W.
36	16º 46′ 27″ N.	152º 49′ 11″ W.
37	17º 33′ 42″ N.	152º 00′ 32″ W.
38	18º 30′ 16″ N.	151º 30′ 24″ W.
39	19º 02′ 47″ N.	151º 22′ 17″ W.
40	19º 34′ 46″ N.	151º 19′ 47″ W.
41	20º 07′ 42″ N.	151º 22′ 58″ W.
42	20º 38′ 43″ N.	151º 31′ 36″ W.
43	21º 29′ 09″ N.	151º 59′ 50″ W.
44	22º 06′ 58″ N.	152º 31′ 25″ W.
45	22º 32′ 54″ N	153º 00′ 33″ W

3. The United States Caribbean Sea area includes:

a) the sea area located off the Atlantic and Caribbean coasts of the Commonwealth of Puerto Rico and the United States Virgin Islands, enclosed by geodesic lines connecting the following coordinates:

POINT	LATITUDE	LONGITUDE		POINT	LATITUDE	LONGITUDE
1	17º 18′ 37″ N.	67º 32′ 14″ W.		28	18º 22′ 22″ N.	64º 40′ 60″ W.
2	19º 11′ 14″ N.	67º 26′ 45″ W.		29	18º 21′ 57″ N.	64º 40′ 15″ W.

3	19º 30′ 28″ N.	65º 16′ 48″ W.		30	18º 21′ 51″ N.	64º 38′ 23″ W.
4	19º 12′ 25″ N. .	65º 6′ 8″ W.		31	18º 21′ 22″ N.	64º 38′ 16″ W.
5	18º 45′ 13″ N.	65º 0′ 22″ W.		32	18º 20′ 39″ N.	64º 38′ 33″ W.
6	18º 41′ 14″ N.	64º 59′ 33″ W.		33	18º 19′ 15″ N.	64º 38′ 14″ W.
7	18º 29′ 22″ N.	64º 53′ 51″ W.		34	18º 19′ 7″ N.	64º 38′ 16″ W.
8	18º 27′ 35″ N.	64º 53′ 22″ W.		35	18º 17′ 23″ N.	64º 39′ 38″ W.
9	18º 25′ 21″ N.	64º 52′ 39″ W.		36	18º 16′ 43″ N.	64º 39′ 41″ W.
10	18º 24′ 30″ N.	64º 52′ 19″ W.		37	18º 11′ 33″ N.	64º 38′ 58″ W.
11	18º 23′ 51″ N.	64º 51′ 50″ W.		38	18º 3′ 2″ N.	64º 38′ 3″ W.
12	18º 23′ 42″ N.	64º 51′ 23″ W.		39	18º 2′ 56″ N.	64º 29′ 35″ W.
13	18º 23′ 36″ N.	64º 50′ 17″ W.		40	18º 2′ 51″ N.	64º 27′ 2″ W.
14	18º 23′ 48″ N.	64º 49′ 41″ W.		41	18º 2′ 30″ N.	64º 21′ 8″ W.
15	18º 24′ 11″ N.	64º 49′ 0″ W.		42	18º 2′ 31″ N.	64º 20′ 8″ W.
16	18º 24′ 28″ N.	64º 47′ 57″ W.		43	18º 2′ 3″ N.	64º 15′ 57″ W.
17	18º 24′ 18″ N.	64º 47′ 1″ W.		44	18º 0′ 12″ N.	64º 2′ 29″ W.
18	18º 23′ 13″ N.	64º 46′ 37″ W.		45	17º 59′ 58″ N.	64º 1′ 4″ W.
19	18º 22′ 37″ N.	64º 45′ 20″ W.		46	17º 58′ 47″ N.	63º 57′ 1″ W.
20	18º 22′ 39″ N.	64º 44′ 42″ W.		47	17º 57′ 51″ N.	63º 53′ 54″ W.
21	18º 22′ 42″ N.	64º 44′ 36″ W. .		48	17º 56′ 38″ N.	63º 53′ 21″ W.
22	18º 22′ 37″ N.	64º 44′ 24″ W.		49	17º 39′ 40″ N.	63º 54′ 53″ W.
23	18º 22′ 39″ N.	64º 43′ 42″ W.		50	17º 37′ 8″ N.	63º 55′ 10″ W.
24	18º 22′ 30″ N.	64º 43′ 36″ W.		51	17º 30′ 21″ N.	63º 55′ 56″ W.
25	18º 22′ 25″ N.	64º 42′ 58″ W.		52	17º 11′ 36″ N.	63º 57′ 57″ W.
26	18º 22′ 26″ N.	64º 42′ 28″ W.		53	17º 4′ 60″ N.	63º 58′ 41″ W.
27	18º 22′ 15″ N	64º 42′ 3″ W		54	16º 59′ 49″ N.	63º 59′ 18″ W.
				55	17º 18′ 37″ N.	67º 32′ 14″ W.

FIFTH SCHEDULE

TYPE APPROVAL AND OPERATING LIMITS FOR SHIPBOARD INCINERATORS

1. Ships' incinerators described in Regulation 16(5) on board shall possess an IMO Type Approval Certificate for each incinerator. In order to obtain such certificate, the incinerator shall be designed and built to an approved standard as described in Regulation 16(5). Each model shall be subject to a specified type approval test operation at the factory or an approved test facility, and under the responsibility of the Administration, using the following standard fuel/waste specification for the type approval test for determining whether the incinerator operates within the limits specified in paragraph 2 of this appendix:

Sludge Oil Consisting of:	75% sludge oil from heavy fuel oil (HFO); 5% waste lubricating oil; and 20% emulsified water.
Solid waste consisting of:	50% food waste; 50% rubbish containing; approx. 30% paper, approx. 40% cardboard, approx. 10% rags, approx. 20% plastic The mixture will have up to 50% moisture and 7% incombustible solids.

2. Incinerators described in Regulation 16(5) shall operate within the following limits:

O_2 in combustion chamber:	6 – 12%
CO in flue gas maximum average:	200 mg/MJ
Soot number maximum average:	Bacharach 3 or Ringelman 1 (20% opacity) (A higher soot number is acceptable only during very short periods such as starting up)
Unburned components in ash residues:	Maximum 10% by weight
Combustion chamber flue gas outlet temperature range:	850 – 1200°C

SIXTH SCHEDULE

BUNKER DELIVERY NOTE

Name and IMO Number of receiving ship:

Port:

Date of commencement of delivery:

Name, address, and telephone number of marine fuel oil supplier:

Product name(s):	Quantity in metric tons:	Density at 15°C, kg/m^3:	Sulphur content (%m/m):

A declaration signed and certified by the fuel oil supplier's representative that the fuel oil supplied is in conformity with regulation 18.3 of this Annex and that the sulphur content of the fuel oil supplied does not exceed:

□ the limit value given by regulation 14.1 of this Annex;
□ the limit value given by regulation 14.4 of this Annex; or
□ the purchaser's specified limit value of (% m/m),

as completed by the fuel oil supplier's representative and on the basis of the purchaser's notification that the fuel oil is intended to be used:

.1 in combination with an equivalent means of compliance in accordance with regulation 4 of this Annex; or

.2 is subject to a relevant exemption for a ship to conduct trials for sulphur oxides emission reduction and control technology research in accordance with regulation 3.2 of this Annex.

The declaration shall be completed by the fuel oil supplier's representative by marking the applicable box(es) with a cross (x).

<signature & name>
(Ship Representative)

<signature & name>
(Bunker Supplier Representative)

Date:

SEVENTH SCHEDULE

TABLE 1
Reduction factors (in percentage) for the EEDI relative to the EEDI Reference line

Ship Type	Size	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 onwards
Bulk carrier	20,000 DWT and above	0	10	20	30
	10,000 – 20,000 DWT	n/a	0-10*	0-20*	0-30*
Gas carrier	10,000 DWT and above	0	10	20	30
	2,000 – 10,000 DWT	n/a	0-10*	0-20*	0-30*
Tanker	20,000 DWT and above	0	10	20	30
	4,000 – 20,000 DWT	n/a	0-10*	0-20*	0-30*
Container ship	15,000 DWT and above	0	10	20	30
	10,000 – 15,000 DWT	n/a	0-10*	0-20*	0-30*
General Cargo ships	15,000 DWT and above	0	10	15	30
	3,000 – 15,000 DWT	n/a	0-10*	0-15*	0-30*
Refrigerated cargo carrier	5,000 DWT and above	0	10	15	30
	3,000 – 5,000 DWT	n/a	0-10*	0-15*	0-30*
Combination carrier	20,000 DWT and above	0	10	20	30
	4,000 – 20,000 DWT	n/a	0-10*	0-20*	0-30*
LNG carrier***	10,000 DWT and above	n/a	10**	20	30
Ro-ro cargo ship (vehicle carrier)***	10,000 DWT and above	n/a	5**	15	30
Ro-ro cargo ship***	2,000 DWT and above	n/a	5**	20	30
	1,000 – 2,000 DWT	n/a	0-5*,**	0-20*	0-30*
Ro-ro passenger ship***	1000 DWT and above	n/a	5**	20	30
	250 – 1,000 DWT	n/a	0-5*,**	0-20*	0-30*

Cruise passenger ship*** having non-conventional propulsion	85,000 GT and above	n/a	5**	20	30
	25,000 – 85,000 GT	n/a	0-5*,**	0-20*	0-30*

* Reduction factor to be linearly interpolated between the two values dependent upon vessel size. The lower value of the reduction factor is to be applied to the smaller ship size.

** Phase 1 commences for those ships on 1 September 2015.

*** Reduction factor applies to those ships delivered on or after 1 September 2019, as defined in paragraph 43 of regulation 2.

Note: n/a means that no required EEDI applies.

TABLE 2
Parameters for determination of reference values for the different ship types

Ship type defined in regulation 2 of Convention		**a**	**b**	**c**
2.25	Bulk carrier	961.79	DWT of the ship	0.477
2.26	Gas carrier	1120.00	DWT of the ship	0.456
2.27	Tanker	1218.80	DWT of the ship	0.488
2.28	Container ship	174.22	DWT of the ship	0.201
2.29	General cargo ship	107.48	DWT of the ship	0.216
2.30	Refrigerated cargo carrier	227.01	DWT of the ship	0.244
2.31	Combination carrier	1219.00	DWT of the ship	0.488
2.33	Ro-ro cargo ship (vehicle carrier)	$(DWT/GT)^{-0.7}$ · 780.36 where DWT/GT<0.3 1812.63 where DWT/GT≥0.3	DWT of the ship	0.471
2.34	Ro-ro cargo ship	1405.15	DWT of the ship	0.498
		1686.17* *DWT of the ship where DWT ≤ 17,000** *17,000 where DWT > 17,000**		
2.35	Ro-ro passenger ship	752.16	DWT of the ship	0.381
		902.59* *DWT of the ship where DWT ≤ 10,000** *10,000 where DWT > 10,000**		
2.38	LNG carrier	2253.7	DWT of the ship	0.474
2.39	Cruise passenger ship having non-conventional propulsion	170.84	GT of the ship	0.214

**to be used from phase 2 thereafter.*

EIGHTH SCHEDULE

INFORMATION ON SHIP FUEL OIL CONSUMPTION DATA COLLECTION

Identity of the ship

- IMO number

Period of calendar year for which the data is submitted

- Start date (dd/mm/yyyy)
- End date (dd/mm/yyyy)

Technical characteristics of the ship

- Ship type, as defined in regulation 2 of this Annex or other (to be stated)
- Gross tonnage (GT)
- Net tonnage (NT)
- Deadweight tonnage (DWT)
- Power output (rated power) of main and auxiliary reciprocating internal combustion engines over 130 kW (to be stated in kW)
- EEDI (if applicable)
- Ice class

Fuel oil consumption, by fuel oil type in metric tonnes and methods used for collecting fuel oil consumption data

Distance travelled Hours

underway