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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**A CASE STUDY OF THE IMPLEMENTATION
AND ENFORCEMENT OF MARPOL ANNEX VI
SULPHUR REGULATIONS IN KENYA**

By

ANNETTE WANGARI MURIITHI

Kenya

A dissertation submitted to the World Maritime University in partial
fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(MARITIME LAW AND POLICY)

2019

Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): 

(Date): 24 September 2019

Supervised by: Associate Professor María Carolina Romero Lares

Supervisor's affiliation: Maritime Law and Policy Specialization

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Abstract

Title of Dissertation: **A Case Study of the Implementation and Enforcement of MARPOL Annex VI Sulphur Regulations in Kenya**

Degree: **Master of Science**

In view of the global 2020 sulphur cap on fuel oil taking effect on 1 January 2020, this is a study of the actions needed to implement and enforce the MARPOL Annex VI sulphur regulations, and to identify the weaknesses in Kenya's current implementation and enforcement regime.

To achieve this, the study has employed the qualitative empirical legal research method, dividing the research into five themes which are critical to ensure compliance with the sulphur regulations.

The themes have described the obligations of a State, including the duty to issue certificates; the duty to perform port State control inspections to foreign ships voluntarily at port; the duty to promote the availability of compliant fuel oil; the duty to establish an enforcement regime comprising of both sanctions and monitoring mechanisms; and the duty to undertake to provide reception facilities for the reception of exhaust gas cleaning residues.

In the national context, the study has examined the laws and institutional structures in place to implement and enforce the sulphur provisions. Furthermore, it has conducted a legal gap analysis in relation to the international standards, the national provisions and the institutional framework in place, to conclusively establish the weakness and challenges faced in implementation and enforcement.

From the established findings, the concluding chapter has provided recommendations to remedy the identified weaknesses.

KEYWORDS: Air Pollution, Sulphur Regulations, Implementation, Enforcement, Challenges, Weaknesses

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List of Abbreviations

Air Quality Regulations	Environmental Management and Co-Ordination (Air Quality) Regulations, 2014
BDN	Bunker Delivery Note
Coast Guard	Kenya Coast Guard Service
ECA	Emission Control Area
EEZ	Exclusive Economic Zone
EMCA	Environmental Management and Co-ordination Act, 1999
EPRA	Energy and Petroleum Regulatory Authority
GHG	Greenhouse Gas
HSFO	High Sulphur Fuel Oil
IAPP Certificate	International Air Pollution Prevention Certificate
IMO	International Maritime Organization
IOMOU	Memorandum of Understanding on Port State Control for the Indian Ocean Region
KEBS	Kenya Bureau of Standards
KMA	Kenya Maritime Authority
KPA	Kenya Ports Authority
LSFO	Low Sulphur Fuel Oil
LOSC	United Nations Convention on the Law of the Sea, 1982
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973, as amended
MARPOL Annex VI	Annex VI to the 1973 International Convention for the Prevention of Pollution from Ships
MARPOL Sample	MARPOL representative fuel oil sample
MEPC	Marine Environment Protection Committee
MSA	Merchant Shipping Act, 2009
NEMA	National Environment Management Authority

PSC	Port State Control
RO	Recognised Organisation
SDG	Sustainable Development Goal
SDG 3	Ensure healthy lives and promote well-being for all at all ages
SDG 13	Take urgent action to combat climate change and its impacts
SDG 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
SO _x	Sulphur Oxides
SO ₂	Sulphur dioxide
VCLT	Vienna Convention on the Law of Treaties, 1969

CHAPTER 1: INTRODUCTION

1.1 Background

The sustainability of the ecosystem and the welfare of coastal communities is dependent on a healthy marine environment (Tanaka, 2015). However, pollution from land based activities, seabed activities, dumping and transport alter the native biodiversity and affect human health, ultimately occasioning economic costs and ecological damage.

The development of the international legal regime for marine pollution began in 1954, after World War II, when the first International Convention for the Prevention of Pollution of the Sea by Oil was concluded. However, it had a limited effect (Tanaka, 2015). In 1958, four Conventions on the law of the sea were concluded, namely, the Convention on the Territorial Sea and the Contiguous Zone; the Convention on the High Seas; the Convention on Fishing and Conservation of the Living Resources of the High Seas; and the Convention on the Continental Shelf (United Nations, 2019a). Of these, it is only the Convention on the High Seas which provided for marine pollution, but only limited to the discharge of oil from ships, pipelines or seabed activities (Tanaka, 2015).

The *Torrey Canyon* incident of 1967 raised international awareness of the risks posed by vessel-source pollution, leading to the adoption of the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties and the International Convention on Civil Liability for Oil Pollution Damage in 1969 (Tanaka, 2015). In the 1970s and 1980s, two principal conventions on the protection of the marine environment were formulated. The International Maritime Organisation (IMO) concluded the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1973 as the comprehensive instrument regarding pollution prevention from ships. The Convention was modified by the 1978 Protocol due to a series of tanker accidents in 1976-1977 (IMO, 2019b). The combined instrument, MARPOL 73/78, entered into force on 2 October 1983. In 1982, the United Nations Convention

on the Law of the Sea (LOSC) was adopted, extending the scope of pollution regulation to land-based activities, dumping and pollution from or through the atmosphere (Tanaka, 2015). It also empowered the IMO to formulate international rules, standards, and to recommend practices and procedures for the protection and preservation of the marine environment.

Thus, seeking to eliminate vessel-source marine environment pollution, the IMO formulated international rules and standards in the form of Annexes under MARPOL, including Annex I on oil pollution; Annex II on pollution by noxious liquid substances carried in bulk; Annex III on pollution by harmful substances carried in package forms; Annex IV on pollution by sewage; Annex V on garbage disposal and Annex VI on air pollution. Annex I and II are compulsory for Contracting States while the rest are optional. This dissertation will focus on MARPOL Annex VI, and in particular, its regulations on sulphur emissions.

Annex VI was developed due to the growing worldwide concern to control air pollution (GEF-UNDP-IMO GLoMEEP Project and IMarEST, 2018) and was added to MARPOL in 1997 upon the adoption of a Protocol to amend the Convention. It entered into force on 19 May 2005, and has 95 Contracting States (as at 2019) representing 96.71% of the world tonnage (IMO, 2017c).

Although shipping facilitates globalization through the transportation of large volumes of cargo, it produces various anthropogenic emissions in normal operations. Ships usually use about 40% of energy in the main propulsion engine, and loses about 50% as heat and exhaust (Ölcer, Kitada, Dalaklis, & Ballini, 2018). These emissions affect the chemical composition of the atmosphere and water, fostering respiratory illnesses, causing deaths, driving climate change and damaging the ecosystem (United Nations, 2018). MARPOL Annex VI addresses this by regulating various pollutants, including, sulphur oxides (SO_x), nitrogen oxides (NO_x), particulate matter (PM), volatile organic compounds (VOCs) and greenhouse gas (GHG) emissions.

According to the World Bank Group handbook (1999) on Pollution Prevention and Abatement,

The combustion of high sulphur fuel oil (HSFO) leads to the formation of SO_x. Exposure to SO_x results in reduced lung function, increased incidence of respiratory diseases, premature mortality, irritation of the eyes, nose and throat and acid rain affecting vegetation.

Considering the international nature of shipping, the transboundary nature of air pollution, the adverse impacts of SO_x on human health and its negative impact to the environment, the IMO has taken a twofold controlled approach to SO_x. First, it has established Emission Control Areas (ECA) including, the Baltic Sea area; North Sea area; North American area; and the United States Caribbean Sea area (IMO, 2019a), where special mandatory measures to prevent, reduce and control air pollution apply. Second, it has established gradual limits on the maximum sulphur content of fuel oils used in ECAs and areas outside ECAs, with the most recent cap set to take effect on 1 January 2020 (see Table 1).

Table 1: Sulphur Fuel Oil Content in Percentage Mass by Mass (% m/m)

Areas outside ECA SO_x Limit	ECA SO_x Limit
0.50% m/m on and after 1 January 2020	0.10% m/m on and after 1 January 2015
3.50% m/m on and after 1 January 2012	1.00% m/m on and after 1 July 2010
4.50% m/m prior to 1 January 2012	1.50% m/m prior to 1 July 2010

Source: Drawn by Muriithi, A. (2019), (Adapted from MARPOL Annex VI).

Pursuant to Annex VI, all ships of 400 gross tonnage (gt) and above engaged in international voyages must on 1 January 2020 demonstrate compliance by using Low Sulphur Fuel Oil (LSFO), alternative fuels, or HSFO on condition that the vessel is affixed with appropriate exhaust gas cleaning systems (EGCS) such as scrubbers.

However, exemptions maybe permitted for safety purposes, for saving life at sea, or where emissions result from the damage to a ship or its equipment, provided that all reasonable precautions have been taken to prevent or minimise emission.

Inventory studies carried out by the IMO in 2009 show a gradual increase of sulphur emissions between 1990 to 2007 (see Table 2). Sulphur emissions peaked to 15 million tonnes (mt) in 2007, a 7.1-million-ton increase from 1990.

Table 2: Exhaust emissions (million tonnes) from total shipping, 1990–2007

Year	NO _x	SO _x	PM	CO	NM VOC	CO ₂	CH ₄	N ₂ O
1990	14	7.9	1.0	1.3	0.4	562	0.05	0.01
1991	15	8.2	1.0	1.4	0.4	587	0.06	0.02
1992	15	8.4	1.0	1.4	0.5	598	0.06	0.02
1993	16	8.7	1.1	1.5	0.5	624	0.06	0.02
1994	16	9.0	1.1	1.5	0.5	644	0.06	0.02
1995	16	9.3	1.1	1.6	0.5	663	0.06	0.02
1996	17	9.5	1.2	1.6	0.5	679	0.07	0.02
1997	18	10	1.2	1.7	0.5	717	0.07	0.02
1998	18	10	1.2	1.7	0.5	709	0.07	0.02
1999	18	10	1.2	1.7	0.6	722	0.07	0.02
2000	19	11	1.3	1.8	0.6	778	0.07	0.02
2001	19	11	1.4	1.8	0.6	784	0.08	0.02
2002	19	11	1.4	1.9	0.6	794	0.08	0.02
2003	21	12	1.5	2.0	0.6	849	0.08	0.02
2004	22	13	1.6	2.1	0.7	907	0.09	0.02
2005	23	13	1.6	2.3	0.7	955	0.09	0.02
2006	24	14	1.7	2.4	0.8	1,008	0.10	0.03
2007	25	15	1.8	2.5	0.8	1,050	0.10	0.03

Source: IMO (2009).

In 2015, the IMO in the Third GHG Study estimated that international shipping produces approximately 10.6 million tonnes of SO_x (as SO₂) annually, which represents about 12% of global SO_x emissions from anthropogenic sources. Contracting States should thus endeavour to effectively implement and enforce the Annex VI provisions in good faith, so as to minimise the level of emissions (Vienna convention on the law of treaties, 1969).

In 2015, world leaders adopted the 2030 Agenda for Sustainable Development in a historic United Nations Summit to mobilize efforts to achieve 17 goals (United Nations, 2019b). Crucial to this research are Sustainable Development Goals (SDG) 3, 13 and 14 on good health and well-being, climate action, and life below water

respectively. Proper implementation and enforcement of MARPOL Annex VI provisions by Contracting Parties will contribute to the achievement of these goals.

Kenya is the only East African State Party to Annex VI, having acceded to it on 14 January 2008, and its subsequent entry into force in the country on 14 April 2008 (IMO, 2017b). Thus, Kenya has a duty to implement its provisions in good faith. A Port Emission Inventory Baseline Report conducted in 2017 at Kenya’s main port of Mombasa revealed, *inter alia*, 6,579.96 tons of SO_x emissions at the Port and anchoring and 617.76 tons emission for manoeuvring at berth until exit from the port (see Table 3).

Table 3: Emission Baseline Survey of the Port of Mombasa

Main Pollutants(tons)				Particulate Matter		Greenhouse Gas Pollutants		
NO _x (tons)	CO (tons)	SO _x (tons)	NH ₃ (tons)	PM ₁₀ (tons)	PM _{2.5} (tons)	CO ₂ (tons)	CH ₄ (tons)	N ₂ O (tons)
774.36	97.56	617.76	0.181	107.221	107.221	43,396.08	0.603	1.084

Source: Northern Corridor Transit and Transport Co-ordination Authority (2017).

These emissions expose the coastal communities to SO_x associated risks, considering their close proximity to the port (see figure 1).

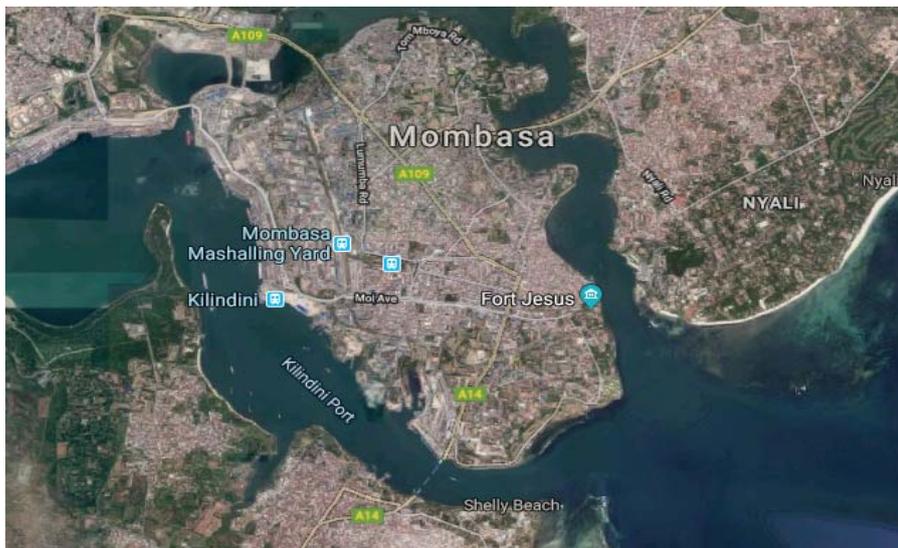


Figure 1: Port of Mombasa

Source: Google Maps (2019).

1.2 Problem Statement

As a Party to MARPOL Annex VI, Kenya has a duty to prevent, reduce and control vessel-source air pollution. Kenya is a monist State and Annex VI formed part of its laws upon ratification. However, it is a non-self-executing treaty instrument. Thus, Kenya has adopted various legislation to realize its requirements. In view of the global sulphur cap taking effect on 1 January 2020, it is crucial to assess the current level of implementation and enforcement of the sulphur regulations and the mechanisms in place to promote the availability of compliant fuel oils, since Kenya is an oil importing country. Little research has been done on this aspect, forming the motivation for this research.

Furthermore, Kenya is expected to experience an increase in ship traffic owing to the expansion of the Port of Mombasa and the completion of the Lamu Port. Although these will occasion a positive economic impact to the Country's economy, without proper legal, monitory and enforcement measures in place, they will pose negative impacts to the marine environment.

In addition, since Kenya is the only East African State that has ratified the Annex, proper regulation would serve as a model to the other East African States.

1.3 Aims and Objectives

This research aims to identify the actions needed to implement and enforce MARPOL Annex VI sulphur regulations in Kenya and to identify the weaknesses in the current implementation and enforcement regime.

In addition, this research objects to determine:

1. the extent to which the sulphur regulations have been implemented in the laws of Kenya;
2. whether the legislation in place are sufficient or contradictory to the international standards; and

3. whether the institutional framework is sufficient to administer and enforce the sulphur regulations.

1.4 Research Questions

To achieve the aims and objectives of the study, this dissertation will address the following questions:

1. What measures has Kenya taken to tackle air pollution from ships?
2. How does Kenya regulate Annex VI sulphur regulations?
3. How are sulphur emission violations established?
4. What enforcement measures are in place in the event of noncompliance?

1.5 Research Methodology

This dissertation aims to identify the actions needed to implement Annex VI sulphur regulations in Kenya and the weaknesses faced in the current implementation and enforcement regime. Based on this, the study employs the qualitative empirical legal research approach focusing on five key themes which are critical to ensure compliance with the sulphur regulations. These are the issuance of certificates, port State control inspections, fuel oil availability, enforcement regime and reception facilities.

The study reviews relevant secondary sources, *inter alia*, books, journal articles, conference proceedings and reports to elaborate on the actions needed for implementation and to identify the various challenges faced in implementation. It also comprises of a legal research which examines the laws and institutional structures provided to implement and enforce the sulphur provisions. Subsequently, it undertakes a legal gap analysis to establish whether the legislative and institutional structures in place are sufficient to secure compliance.

1.6 Organisation of Chapters

This Research has been organized into seven chapters. Chapter one provides the background of the research, the statement of the problem, the aims and objectives of the research, the research questions, the research methodology and the structure of the

study. Chapter two provides a literature review on the implementation of IMO instruments in national law and the implementation and enforcement of MARPOL Annex VI sulphur regulations. Chapter three discusses the international regime for vessel-source sulphur emissions. Chapter four discusses the national regime for vessel-source sulphur emissions. Chapter five discusses the institutional framework for implementing and enforcing the national provisions on vessel-source sulphur emissions. Chapter six undertakes a legal gap analysis of the implementation and enforcement of MARPOL Annex VI sulphur regulations. Chapter seven provides the conclusion and recommendations to overcome the identified weaknesses and challenges.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

To model this research, this chapter reviews and discusses various literature on the implementation of IMO instruments into national law to understand how States transpose IMO instruments into national law. Furthermore, it discusses the five key themes critical for the implementation and enforcement of the MARPOL Annex VI sulphur regulations, while also highlighting the challenges that may be faced by developing Countries in implementation.

2.2 Implementing IMO Instruments in National Law

IMO instruments, otherwise referred to as Conventions, Protocols, Codes or Treaties, are international agreements concluded between States in written form and governed by international law (VCLT, 1969). Thus, every State Party to such instruments must perform them in good faith (*pacta sunt servanda*), and not justify noncompliance on the basis of internal law provisions. To prevent breach of treaty obligations and liability in international law, two approaches have been taken by States' Constitutions to transpose international instruments into national law. These are the monist and dualist approach.

2.2.1. Monist Approach

In this approach, international law automatically enters into force in the State where it is ratified and has entered into force. Aust (2005) establishes that once a treaty enters into force for a State, and it has been concluded in accordance with its Constitution, it automatically forms part of the State's national law, without legislation. However, when the treaty demands additional measures from the State (non-self-executing), legislation will be required.

Kolb (2016), taking no less approach, introduces a fundamental perspective on the relationship between international and national law. He establishes that international law and national law relate to a common overarching legal system, although they are

separate legal orders. International law and national law have different sources and subjects. However, there is an inner link between the two since both are created through the consent of the State. Thus, the treaty forms part of a State's national law upon its intentional entry into force. Kolb also highlights an advantage of the monist approach which is, the application of the treaty is not hampered by delay in Parliamentary transformation.

In essence, the monist approach holds that a self-executing treaty automatically forms part of the national law of a State upon its entry into force, while a non-self-executing treaty will require legislation to achieve the measures demanded from a State.

2.2.2. Dualist Approach

The dualist approach requires all treaties whether self-executing or non-self-executing to be transposed through legislation into national law to have effect in a State.

Kolb (2016), Galbraith (2014) and Kirchmair (2017) emphasize that international law and national law are separate legal orders with different sources thus different grounds for validity, and governing different subject matters, with international law governing inter-state relations and national law governing intra-state dealings. Therefore, for a treaty to be applied within a dualist legal system, it must be transformed into national law through legislation.

Aust (2013) introduces a fundamental perspective to the dualist approach. He notes that once treaty norms are transformed into national law, they have the status of national law only. Thus, a future legislation can repeal or amend its provisions. This exposes a dualist State to the risk of being in breach of treaty objectives.

In summary, dualist States grant no special status to treaties. Their effect in the legal system is dependent on national legislation.

2.2.3. Which is the better approach?

IMO Instruments are non-self-executing in nature. They provide obligations to be prescribed by national Administrations through national law. As such, it is not imperative to discuss which approach is better as a State will be required to meet the obligations of a Convention by establishing national provisions in either approach.

Taking this into account, Chiemanukulkit (2018) in his legal study on the Legislative Techniques for the Implementation of IMO Instruments into Domestic Legislation, published by the IMO Legal Committee 106th session, establishes that both monist and dualist States implement IMO instruments by enacting national law which, *inter alia*, designates an enforcement authority, defines the methodology to expedite the flag, coastal and port State mandates, and provides for offences and their respective penalties (LEG 106/INF.3, 2019).

2.3 Implementation and Enforcement of MARPOL Annex VI Sulphur Regulations

MARPOL Annex VI requires all ships of 400gt and above, operating outside ECAs to use fuel oil of 0.50% m/m sulphur content effective 1 January 2020. Thus, all ships must demonstrate compliance by using the LSFO or equivalent alternatives such as alternative fuels or arrangements and fittings such as EGCS. To oversee compliance, Annex VI confers States some rights and obligations which are critical to ensure reduction of SO_x emissions. These are illustrated and further discussed hereunder.

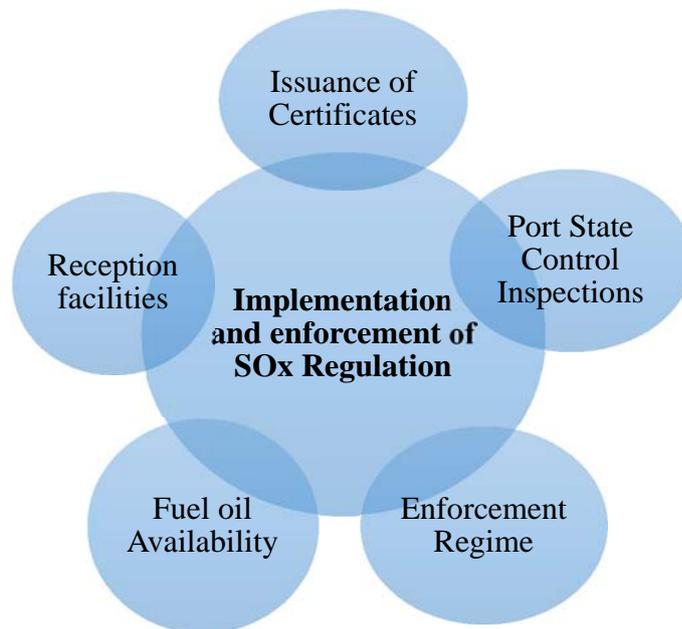


Figure 2: Obligations of States

Source: Drawn by Muriithi, A. (2019).

2.3.1. Issuance of Certificates

To establish compliance with the sulphur regulation, all ships of 400gt and above engaged in international voyages must have on board the International Air Pollution Prevention (IAPP) Certificate. This Certificate is issued by a ship's Administration (flag State) after periodic surveys and inspections confirming that the ship's equipment, systems, and arrangements comply with the applicable technical standards.

Linné (2017) in his research on Regulating Vessel-Source Air Pollution observes that surveys are a basis for issuing certificates. Thus, a flag State must conduct periodic inspections on a flagged vessel to ensure that its condition is commensurate to that stated in the Certificate.

Considering all the surveys and certifications that Member States are required to perform in fulfilment of IMO instruments, IMO (2013) notes that no State has sufficient technical, human and financial resources to oversee all the surveys and certification. Delegation of these mandates to Recognised Organisations (ROs) and

nominated surveyors is hence necessary. However, the flag Administration retains full responsibility over the certificates.

To ensure completeness and efficiency of ROs and nominated surveyors as regards the delegated mandates, the Code for Recognized Organizations (RO Code, 2013) requires flag States as a minimum to:

- i. have a formal written agreement with the ROs specifying the scope of authorization, including, *inter alia*, relevant instruments and national legislation; surveys, issuance, withdrawal or cancellation of certificates, and corrective actions;
- ii. provide the RO with all appropriate instruments of national law giving effect to the provisions of the conventions;
- iii. issue specific instructions detailing the procedures to be followed in carrying out statutory certification and services; and
- iv. issue specific instructions detailing actions to be followed in the event that a ship is found unfit to proceed to sea.

With regard to the sulphur regulation, a flag State must prescribe instructions detailing the procedures to be followed in carrying out statutory certification and services; and the procedures for handling and approving equivalent means to reduce SO_x emissions. According to Karim (2014), developing countries face a further challenge of scarce legal expertise to draft these technical provisions. According to him, “the technical experts find it difficult to understand the legal terms, while legal officers find it difficult to understand the technical terms” (Karim, 2009).

2.3.2. Port State Control Inspections

Ships are subjected to inspections in ports. These inspections are referred to as Port State Control (PSC) inspections. Their aim is to verify compliance with established international standards. As a general rule, inspections are limited to verifying that there is a valid certificate on board. Rothwell, Elferink, Scott, & Stephens, (2015) note that a further inspection will only be undertaken where there are clear grounds for believing

that the condition of the ship or its equipment does not correspond substantially with the particulars of that certificate or where the ship does not carry a valid certificate.

For inspections conducted pursuant to the sulphur regulation, a port State officer should, pursuant to the Guidelines established by the Marine Environment Protection Committee (MEPC) 74 for Port State Control under MARPOL Annex VI (2019), examine the following documents during initial inspections:

- i. The IAPP Certificate to confirm that the ship has been subjected to the necessary surveys;
- ii. The supplement to the IAPP Certificate to ascertain the ship's air pollution prevention equivalent arrangement;
- iii. The written procedures for fuel-oil-change-over operations where the ship operates in ECAs;
- iv. The Bunker Delivery note (BDN) and representative fuel oil sample (MARPOL Sample); and
- v. The notification issued by the ship to the flag Administration and the competent authority of the relevant port of destination when it cannot obtain compliant fuel oil, among others.

Where there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificates or documents, the PSC Officer may undertake a further inspection including, *inter alia*:

- i. sampling the fuel oil with the MARPOL sample;
- ii. where applicable, checking and verifying whether the EGCS has been installed and operated in accordance with its approved documentation according to the survey procedures; and
- iii. verifying that the EGCS is properly functioning, and there are continuous-monitoring systems with tamper-proof data recording and processing devices (MEPC.320(74)).

Pursuant to Annex VI, verification of the fuel oils must be carried out by a laboratory that is accredited for the purpose in accordance with ISO/IEC 17025.

According to Karim (2014) a port State requires technical expertise and sophisticated equipment to perform PSC inspections. Developing countries may face a challenge of inadequate technical expertise to undertake all the inspections required in the various IMO Conventions. Furthermore, due to competing interests and limited financial resources, these States may not be able to acquire the required equipment to facilitate inspections.

2.3.3. Fuel Oil Availability

The reduction of SO_x emission levels is dependent on the type of fuel oil used. Thus, Annex VI mandates States to take all reasonable steps to promote the availability of compliant fuel oils.

According to Oriere (2018), fuel oil producing Member States should decide on whether to enhance their refinery facilities to produce LSFO or in the medium to long term, import the LSFO. Additionally, oil importing Member States should oversee the supply of LSFO by fuel oil suppliers through regulation. Pursuant to Annex VI, such States should, *inter alia*, maintain a register of local fuel oil suppliers; require the suppliers to provide the BDN and MARPOL sample; require the suppliers to retain a copy of the BDN for at least three years for inspection and verification when considered necessary; and take appropriate action against suppliers found to deliver fuel oil that does not comply with that stated on the BDN. MEPC.320(74) further suggests that States in their administrative capacity should, when considered necessary, take a sample and test fuel oils from bunker barges or shore bunker terminals to verify compliance with international standards.

Oriere notes that oil refining developing States will face financial challenges in their attempts to enhance their oil processing facilities. This is because such initiatives require huge financial investments and developing States have more urgent necessities to provide.

2.3.4. Enforcement Regime

The enforcement regime is twofold. To deter violations, States must prohibit violations and establish sanctions, and have compliance monitoring measures in place.

2.3.4.1 Compliance Monitoring Measures

For sanctions to be imposed, a violation must be established. In effect, MARPOL Annex VI requires State Parties to cooperate in the detection and enforcement of sulphur violations using practicable measures of detection and environmental monitoring. In agreement, Ringbom (2017a) notes that initial emission detection measures can be used to target ships for further port inspections and that their assessments can be used in the calculation of penalties.

Some initial detection measures for SO_x emissions that may be used include:

- i. Sniffers with ultraviolet fluorescence radiometer which can measure about 15% of SO₂ (European Environment Agency, 2013) and can be affixed on bridges, aircrafts or unmanned aerial vehicles (Van Roy & Scheldeman, 2016).
- ii. Differential Optical Absorption Spectrometry (DOAS) affixed on aircrafts which can measure SO₂ with an accuracy of about 40% using frequencies of light passing through plume (Berg, Mellqvist, Jalkanen, & Balzani, 2012).

However, these measures are expensive to acquire and operate.

2.3.4.2 Sanction regime

All Contracting States have a mandate to prohibit violation of the sulphur standards and establish sanctions for noncompliance. LOSC requires only monetary penalties to be imposed in respect of violations committed beyond the territorial sea of a State. MARPOL requires the sanctions to be adequate in severity to discourage violations and equally severe irrespective of where the violation occurs. Both Conventions are silent as to the specific nature and level of liability. Thus, according to Pozdnakova (2012), the content and form of penalties is left under the discretion of States.

Consequently, different states adopt different types of sanctions and different levels of penalties.

i) Types of Sanctions

Sanctions may either be criminal or administrative in nature. This notwithstanding, Ringbom (2017a) highlights that both natural and legal persons can be potentially subject to sanctions. This is so as to deprive economic benefits to noncompliant companies and to penalize persons for any act or omission that causes operational failure, thus occasioning noncompliance.

(a) Criminal Sanctions

Criminal sanctions are only imposed by Courts of competent jurisdiction upon successful proof of the elements of culpability. According to Ringbom (2017b), for a Court to adjudge a violation a crime and impose penalties, the accused person's *mens rea* (intent) or negligence must be proved. The onus of proof usually lies on the prosecutor, and the accused is presumed innocent until contrary is proven. He further notes that prosecutors may have difficulties in confirming culpability when the ship has left the country.

Bang (2009) observes that although LOSC requires States to impose monetary penalties, some States impose non-monetary penalties such as imprisonment on omissions that are inherently connected with the main extraterritorial violation. As such, ships are not penalized with pollution violations but with related offences such as falsification of records, failure to inform authorities, interference with law enforcement officials or witness tampering. IMO (2013) notes that such sanctions are important to promote truthfulness in reporting, monitoring and enforcement.

(b) Administrative Penalties

Administrative sanctions are issued by the inspecting authority. According to Ringbom (2017b), the basis for culpability is strict liability, thus they provide a more flexible and timely sanction procedure. IMO (2013) notes that since these sanctions

are swift, they have an important deterrent effect. Courts only acquire jurisdiction on appeal against the level of the penalty issued (Ringbom, 2017a).

ii) Level of Penalties

MARPOL requires sanctions to be adequate to discourage violations and equally severe irrespective of where the violation occurs. According to Ringbom (2017), adequate penalties refer to penalties which deprive economic benefits to perpetrators.

To be considered adequate, IMO (2013) suggests that a State may prescribe penalties with a range of minimum and maximum amounts, so that fines are imposed on the basis of the severity of the offence. Apart from the amount, Ringbom (2017b) further suggests that a sanction should define its basis for imposition and the period of calculation.

Ringbom suggests that a ship's fuel consumption could be used as a basis for calculation of penalties as it may ascertain the economic benefits gained from using noncompliant fuel. Furthermore, he proposes the ship's preceding voyage to the port in question as a reasonable period for computation of penalties, considering the difficulty in establishing the actual period of violation and the need to discourage noncompliance. On the amount of penalties, Ringbom (2017b) opines that, "fines need to be updated from time to time to actually reflect the difference in price between compliant and non-compliant fuels."

2.3.5. Reception facilities

Ships fitted with EGCS as equivalent arrangements to achieve the SO_x regulation will require reception facilities to dispose of residues produced from their operation. Thus, Regulation 17 of Annex VI requires States to undertake to provide a reception facility.

IMO (2016), reports that approximately 0.1 to 0.4kg/MWh of sludge residues are expected to be generated by the different types of scrubbers. These sludges are expected to be acidic and contain substantial amounts of salts and heavy metals. Since low volumes are expected to be produced, IMO suggests that collection by watertight

and sheltered trucks/barges to land-based exhaust gas cleaning systems will constitute adequate service.

Provision of reception facilities is a major challenge to most developing countries. Establishing a reception facility requires the development of a waste management strategy which involves the simultaneous provision of administrative and legal standards to guide and monitor the handling of wastes; the use of modern waste management technology; and the establishment of infrastructure and support services within and outside the port (IMO, 2016). This requires huge financial investments. Karim (2009) observes that developing countries have competing urgent priorities to satisfy, thus consider this requirement as a luxury and ideals to strive for.

2.4 Challenges that may be faced by Kenya in Implementation

Kenya is a developing State. Apart from the challenges discussed above, it may face additional challenges as it is the only East African State Party to MARPOL Annex VI. These challenges include the enforcement of sanctions and monitoring of violations.

2.4.1 Enforcement of Sanctions

IMO (2013) notes that common rules on sanctions between neighbouring States discourages the “safe haven mentality to potential polluters.” Being the only State Party to the Annex in the region, Kenya may experience a challenge in prescribing penalties that are adequate in severity to discourage violations and to suppress the safe haven mentality.

2.4.2 Monitoring of Violations

Annex VI mandates all Contracting Parties to cooperate in the detection and enforcement of sulphur violations using practicable measures of detection and environmental monitoring. Being the only State Party in the region, Kenya may have to invest in acquiring SO_x initial detection measures to monitor potential violations in its maritime space.

2.5 Conclusion

This chapter has discussed the various approaches of transforming IMO instruments into national law. It has also identified and discussed the key actions a State should undertake to implement and enforce the MARPOL Annex VI sulphur regulations, and highlighted the possible obstacles in implementation. Additionally, it has identified possible challenges that Kenya may face, being the only State in the East African Region Party to the Annex. This research will apply the literature review to identify the weaknesses in Kenya's current implementation and enforcement regime.

The next chapter will discuss the international regime for vessel-source sulphur emissions.

CHAPTER 3: INTERNATIONAL REGIME FOR VESSEL-SOURCE SULPHUR EMISSIONS

3.1 Introduction

This chapter discusses the jurisdiction of a State to regulate sulphur emissions from ships, so as to delimit its competency in the different maritime zones.

Jurisdiction is the power of a State to implement and enforce a Convention. According to international law, jurisdiction may be classified into prescriptive and enforcement jurisdiction. Prescriptive jurisdiction, also known as legislative jurisdiction, is the power of a State to regulate a conduct (Schofield, Yi, & Kwon, 2014). Conversely, enforcement jurisdiction is the power of a State to compel compliance or to punish noncompliance with its laws (Ryngaert, 2015).

The basis of jurisdiction for maritime Conventions is the LOSC. LOSC grants a State jurisdiction in the different maritime zones, namely, the territorial sea, exclusive economic zone (EEZ), and high seas, as either a flag, coastal or port State. A flag State is the State of a ship's nationality. A coastal State is a State with a coastline, thus an interest to protect its maritime domain (Rothwell, Elferink, Scott, & Stephens, 2015). A port State verifies whether foreign ships comply with international rules and standards (Froholdt, 2018).

The prescriptive and enforcement jurisdiction of States on air pollution from ships is provided under the LOSC, MARPOL, and MARPOL Annex VI. Table 4 briefly provides an overview of the jurisdiction of States to regulate sulphur emissions from ships under LOSC, MARPOL and MARPOL Annex VI. This is further discussed hereunder.

Table 4: LOSC, MARPOL and MARPOL Annex VI Cross Reference

State	Jurisdiction	LOSC	MARPOL	ANNEX VI
1. Flag State	Prescriptive	Articles: 211(2); 220 (4).	Article 1.	Regulations: 4; 5; 6; 9; 14.
	Enforcement	Article 217.	Articles: 4(1), (4), (3); 6(4).	
2. Coastal State	Prescriptive	Article 211(4) & (5).	Articles: 4(2), (4).	
	Enforcement	Article 220(3), (5) & (6) Safeguards – Articles 227; 300; 226; 232; 230; 228.	Articles: 4(2); 6(1), (3).	Regulation 11(1).
3. Port State	Prescriptive	Article 211(3)	Articles: 4(2) &(4)	
	Enforcement	Articles: 218; 219; 220(1) Safeguards – Articles 227; 300; 226; 232; 230; 228.	Articles: 5(2), (3), (4); 4(2); 6(2), (5), (3); 7.	Regulation: 11(2), (5); 14; 17; 18; Appendix V.

Source: Modified and tabulated by Muriithi, A. (2019). (Adapted from IMO, 2013)

3.2 Jurisdiction of a State to Implement Sulphur Regulations

3.2.1 Flag State

LOSC and MARPOL grant flag States the primary responsibility to implement international standards on the prevention, reduction and control of pollution of the marine environment on their vessels of registry by promulgating and enforcing national law.

With regard to sulphur emissions, Annex VI requires a flag State to:

- i. survey and inspect ships at appropriate intervals;
- ii. prescribe procedures for handling and approving equivalent arrangement proposals;
- iii. issue the International Air Pollution Prevention (IAPP) Certificate;
- iv. prescribe the period of validity of the IAPP certificate through national law, but not exceeding five years; and
- v. prescribe a log-book to guide the recording of fuel-oil-change-over operations for ships operating in ECAs.

A flag State must survey and inspect its vessels of registry at appropriate intervals and issue the IAPP Certificate to verify compliance with the prescribed technical standards (Rothwell & Stephens, Tim, LL. B., /M.Phil., 2010). A ship must be subjected to an initial survey before it is put into service to ensure that the equipment, fittings and material are compliant; a renewal survey; an intermediate survey; an annual survey; and an additional survey whenever any important repairs or renewals are made so as to ensure that they have been made effectively.

Considering the various mechanisms available to control sulphur emissions, flag States must prescribe through national regulations, the procedure for handling and approving equivalent arrangement proposals, taking into account relevant guidelines developed by the IMO, and inform IMO for circulation to the Parties the such approved equivalents (IMO, 2013).

The IAPP Certificate must only be issued when compliance is verified. It serves as prima facie evidence of compliance in the inspections undertaken by other States.

Paragraph 2.3 in the Supplement to the IAPP Certificate indicates whether a ship uses compliant fuel oil or arranged equivalent (see Figure 3) (Ringbom, 2017).

<p>2.3 Sulphur oxides (SO_x) and particulate matter (regulation 14)</p> <p>2.3.1 When the ship operates outside of an emission control area specified in regulation 14.3, the ship uses: (<i>KR</i> : Replaced by Res.MEPC.305(73))</p> <p>.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.50% m/m, and/or</p> <p>..... <input type="checkbox"/></p> <p>.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.50% m/m</p> <p>..... <input type="checkbox"/></p> <hr/> <p>2.3.2 When the ship operates inside an emission control area specified in regulation 14.3, the ship uses:</p> <p>.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.10% m/m, and/or</p> <p>..... <input type="checkbox"/></p> <p>.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.10% m/m</p> <p>..... <input type="checkbox"/></p> <p>2.3.3 For a ship without an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6, the sulphur content of fuel oil carried for use on board the ship shall not exceed 0.50% m/m as documented by bunker delivery notes (<i>KR</i> : Added by Res.MEPC.305(73))</p>	<p>Acti Go to</p>
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Figure 3: Supplement to the IAPP Certificate Paragraph 2.3

Source: MARPOL Annex VI

The survey of ships and the issuance of the IAPP Certificate may be undertaken by Administrative surveyors or delegated to recognized organisations (RO) or nominated surveyors. However, the Administration has full responsibility over the certificates, despite delegating authority to ROs and nominated surveyors.

3.2.2 Coastal State

Pursuant to LOSC, a coastal State has legislative jurisdiction to control pollution in the territorial sea as required by international standards, having regard to the right of innocent passage of vessels. It also has legislative jurisdiction to implement international standards to protect its marine environment in the EEZ, having due regard to the rights and duties of other States.

MARPOL requires coastal States to prohibit violations and establish sanctions for violations of standards committed within their jurisdiction. Thus, a coastal State has a

duty to prohibit sulphur emission violations and prescribe sanctions for noncompliance.

3.2.3 Port State

With regard to sulphur emissions, port States have the responsibility to prohibit violations, to regulate fuel oil suppliers; to inspect ships; and to undertake to provide reception facilities.

(a) Prohibition of Violations

Port States are granted jurisdiction to prohibit and establish sanctions for violations of international standards committed within the territorial sea or the EEZ of the State, or the high seas. As such, port States can establish sanctions for vessels which do not comply with the sulphur standards.

(b) Regulation of Fuel Oil Suppliers

Ships demonstrate compliance with sulphur requirements through the inspection of the BDN and the sampling of the MARPOL sample which are issued by the fuel oil suppliers (Ringbom, 2017a). As ship operators may purchase fuel oil in good faith, it is imperative that States regulate fuel oil suppliers to encourage the availability of compliant fuel oil. Thus, pursuant to Annex VI, port States have a duty to ensure that their appropriate authorities, *inter alia*:

- i) maintain a register of local suppliers of fuel oil;
- ii) require local suppliers to provide the BDN and MARPOL sample, certified to meet the requirements of regulations 14 and 18; and
- iii) require local suppliers to retain a copy of the BDN for at least three years for inspection and verification by the port State as necessary.

(c) Inspection of Ships

A port State is required to perform PSC inspections to any foreign ship in its port to verify whether it has emitted SO_x contrary to the international standards. The State may also carry out inspections when it receives a request for an investigation from any Party together with sufficient evidence that the ship has emitted substances.

Ships demonstrate compliance with sulphur requirements through the IAPP Certificate, the BDN and the MARPOL sample. The IAPP Certificate indicates whether a ship uses compliant fuel oil or an arranged equivalent. The BDN records details of fuel oil for combustion purposes delivered to and used on board. The MARPOL sample is used to compare the fuel oil used on board to that delivered to the ship.

As discussed in Chapter 2, inspections must be limited to verifying that there is a valid certificate on board. Further inspection will only be undertaken where there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of that certificate or where the ship does not carry a valid certificate.

The PSC authority must inspect the BDN expeditiously as possible without causing undue delay to the ship. The authority may take certified copies of each BDN and verify their contents through consultations with the port where the note was issued.

The IMO has adopted two guidelines to aid port State officials in verifying compliance. These are the:

- i. 2019 Guidelines for On Board Sampling for the Verification of the Sulphur Content of the Fuel Oil Used On Board Ships; and
- ii. 2019 Guidelines for Port State Control under MARPOL Annex VI Chapter 3.

(d) Provision of Reception Facility

Ships fitted with exhaust gas cleaning systems may require reception facilities to dispose of exhaust gas cleaning residues. Annex VI requires States to undertake to provide a reception facility. According to the GEF-UNDP-IMO GLoMEEP Project and IMarEST (2018) Ship Emission Toolkit Guide No.2, this provision does not mandate a Government to provide the facility. A terminal operator could be required to provide the facility.

3.3 Jurisdiction of a State to Enforce Sulphur Regulations

3.3.1 Flag State

LOSC grants flag States enforcement jurisdiction to ensure compliance with the established international standards on protection of the marine environment. The State must prohibit violations and prescribe adequate penalties to violations wherever they occur. Pursuant to MARPOL, the penalties must be adequate in severity to discourage violations. Where a breach is established, the State must undertake proceedings (Rothwell & Stephens, Tim, LL. B., M.Phil., 2010).

3.3.2 Coastal State

With regard to sulphur emissions, mere imposition of sanctions by a coastal State will not always establish a deterrent effect. Additional measures such as data from technical monitoring and evidence collection measures may be used to trigger inspections thus, discouraging violations and supporting sanctions (IMO, 2013). In effect, MARPOL Annex VI obliges all States Parties (including coastal States) to cooperate in the detection and enforcement of sulphur violations using practicable measures of detection and environmental monitoring, adequate reporting procedures and accumulation of evidence

Upon detecting and gathering sufficient evidence of sulphur emission violations in the territorial sea, a coastal State has unlimited enforcement jurisdiction (Rothwell & Stephens, Tim, LL. B., M.Phil., 2010). It may undertake a physical inspection of the vessel relating to the violation and institute proceedings, including detention of the vessel (LOSC, 1982). For violations committed by a ship in the EEZ, the coastal State may:

- i. require the vessel to give information regarding its identity and port of registry, its last and its next port of call and other relevant information;
- ii. request the relevant port of call to inspect the ship and furnish to it sufficient evidence proving violation of sulphur emission standards;

- iii. furnish to the Administration of the ship such information and evidence in its possession proving violation of sulphur emission standards;
- iv. where the violation results in a substantial discharge threatening significant pollution of the marine environment, and the vessel refuses to give information or gives information manifestly variant with the evident factual situation, the coastal State may, if circumstances justify, undertake physical inspection of the vessel; or
- v. institute proceedings, including detention of the vessel, where there is clear objective evidence that the vessel committed a violation causing major damage or threat of major damage to the marine environment.

3.3.3 Port State

Port States have an enforcement jurisdiction over fuel oil suppliers and foreign vessels and an overall reporting mandate

(a) Enforcement mandate over fuel oil suppliers

A port State should take corrective action measures against fuel oil suppliers found to deliver fuel oil that does not comply with that stated on the BDN.

(b) Enforcement mandate over foreign vessels

Upon discovery of a violation, a port State can either cause proceedings to be taken in accordance with its law; or notify the flag State of the violation, furnishing to it such information and evidence necessary to prove noncompliance. Thus, it is imperative that a ship notifies its flag Administration and the Competent Authority of the relevant port of destination when it cannot purchase compliant fuel oil.

Where the inspection indicates a violation, a port State has authority to require the ship to present a record of the actions taken to attempt to achieve compliance; and provide evidence that it attempted to purchase compliant fuel oil in accordance with its voyage plan, and further attempts to locate alternative sources for fuel oil. The Authority must take into account all relevant circumstances and the evidence presented to determine

the appropriate action to take. However, the ship must not be required to deviate from its intended voyage or to delay unduly the voyage in order to achieve compliance.

(c) Reporting Mandate

The port State has a reporting mandate when an inspection indicates a violation or upon the discovery of noncompliant fuel oil. Pursuant to Annex VI, the State must:

- forward a report to the ship's flag State where an inspection indicates a violation of the international standards;
- when the investigation is undertaken pursuant to a request by another Party, forward a report of such investigation to the Party that made the request and to the flag State;
- notify the IMO when a ship has presented evidence of the non-availability of compliant fuel oil through the MARPOL Annex VI GISIS module; and
- inform the Party or non-Party under whose jurisdiction a BDN was issued of cases of delivery of noncompliant fuel oil, giving all relevant information.

3.4 Conclusion

This chapter has established the jurisdiction a flag, coastal and port State over vessel-source sulphur emissions. This is key to delimit the competencies of a State in the different maritime zones. The next chapter will analyse the national regulatory framework on vessel-source sulphur emission.

CHAPTER 4: NATIONAL REGIME FOR VESSEL-SOURCE SULPHUR EMISSIONS

4.1 Introduction

This chapter establishes Kenya's legislative framework for vessel-source sulphur emissions.

Kenya is a flag, coastal and port State. It is a flag State with a gross tonnage of 16,979 as at 2018 (IMO, 2017b). It is a coastal State with a coastline of approximately 640 sq.km fringed with a number of islands, and a sea space of approximately 301, 854 sq.km comprising of a 12nm territorial sea and 200nm EEZ (Maritime zones act, 1989). It is a port State with the Port of Mombasa serving as a vital link to East African region.

Kenya acceded to the 1997 Protocol on 14 January 2008, and it entered into force in the country on 14 April 2008. Kenya is a monist State by virtue of Article 2(6) of the Constitution (2010), which establishes that any treaty or convention ratified by Kenya forms part of the laws of Kenya. However, Annex VI is a non-self-executing instrument. There are various legislation and regulations in place which transpose its provisions into national law.

As discussed in Chapter 2, a State has a mandate to issue certificates, perform PSC inspections, promote the availability of compliant fuel oil, enforce laws and undertake to provide reception facilities to ensure compliance of MARPOL Annex VI Sulphur regulations. The national regime of Kenya will be discussed under these mandates.

4.2 Issuance of Certificates

4.2.1 Merchant Shipping Act, 2009

The Merchant Shipping Act (MSA) is primary law regulating shipping in Kenya. It makes provisions, *inter alia*, for the survey, certification and registration of Kenyan ships, ship safety and marine pollution.

With regard to the sulphur regulation surveys and certification, the Act provides that officers of the Administration or authorised persons may at all reasonable times board, inspect and survey a Kenyan ship for purposes of conducting surveys required for certification, so as to ensure compliance with the provisions of the Act and regulations made thereunder.

The Act also grants a surveyor the power to reasonably require any person in charge of a ship to activate or dismantle any machinery of the ship so as to confirm its condition, and the power to detain any ship which does not comply with the provisions of the Act, where such detention is warranted in the circumstances.

4.3 Port State Control Inspections

4.3.1 Merchant Shipping Act

The MSA grants ship inspectors the power to board and inspect a ship at any reasonable time and, *inter alia*, to demand the production of documents, records and other evidence; take such measurements and samples as may be necessary and take testimony of witnesses under oath, for the purposes of conducting inspection. This must be done expeditiously without causing unnecessary delay to the ship.

4.3.2 Environmental Management and Co-ordination Act, 1999

The Environmental Management and Co-ordination Act (EMCA) empowers environmental inspectors with the power to, at all reasonable times and without a warrant, enter any vessel and, *inter alia*, make examinations and enquiries to establish compliance; require the production of, inspect, examine and copy registers, records and other relevant documents; and to take samples for tests and analysis.

4.3.3 Environmental Management and Co-Ordination (Air Quality) Regulations, 2014

The Environmental Management and Co-Ordination (Air Quality) Regulations (herein after Air Quality Regulations) establishes that the Environmental Authority may carry

out monitoring of ambient air quality (see Table 5) or request a relevant lead agency to do so on its behalf.

4.3.4 Memorandum of Understanding on Port State Control for the Indian Ocean Region

Kenya has been part of the Memorandum of Understanding on Port State Control for the Indian Ocean Region (IOMOU) since 26 March 2002. The MOU provides a harmonized system of port State control and strengthens cooperation and the exchange of information. It, *inter alia*, provides for the following inspection procedure:

1. A visit on board a ship by the Authority to check the validity of the certificates and documents and furthermore satisfy that the crew and the overall condition of the ship and its equipment meet the provisions of the relevant instruments.
2. Whenever the above conditions do not substantially meet the requirements of a relevant instrument, a more detailed inspection is to be carried out.
3. The Authority to endeavour to ensure the rectification of all deficiencies detected or allow the ship to proceed to a port where any such deficiencies can be rectified.
4. When a ship is detained, the Authority to immediately notify the flag State concerned and its Consul or the nearest diplomatic representative of the action taken. Where relevant, the organisation responsible for the issue of the certificate(s) shall also be informed.

4.4 Fuel Oil Availability

4.4.1 Energy Act, 2019

Kenya is an oil importing country. To secure availability of compliant fuel oil, the Energy Act provides that the Energy and Petroleum Regulatory Authority shall monitor and enforce local energy content undertakings and, *inter alia*; set minimum

requirements for local content in local content plans; and undertake local content monitoring, audit and enforcement.

4.4.2 Standards Act, 1974

The Standards Act promotes standardisation of the specification of commodities. To facilitate the availability of compliant fuel oils, it establishes a monitoring mechanism where a licensed supplier may be requested in writing, to furnish such samples of the commodity to which the permit relates and all such information in regard to the commodity.

4.5 Enforcement

Enforcement relates to both fuel oil suppliers and noncompliant vessels.

4.5.1 Fuel Oil Suppliers

4.5.1.1 Energy Act

To discourage the furnishing of false statements by licensees as regards the information requested from them, the Act establishes that any person who makes a false statement commits an offence and shall, on conviction, be liable to a fine not exceeding ten million shillings (approx. USD 100,000) or imprisonment for a term not exceeding five years or to both.

The Act further provides that an employer shall be vicariously liable for an offence committed by an employee unless he/she proves that the offence was committed against the employer's express or standing directions.

The Act additionally provides a general penalty of a fine not less than one hundred thousand shillings (approx. USD 1,000) where the Act fails to provide a fine for a contravention.

4.5.1.2 Standards Act

Pursuant to this Act, any person who fails to furnish the samples required within the specified period is guilty of an offence and liable to a fine not exceeding fifty thousand shillings (approx. USD 500) or to imprisonment for a term not exceeding six months, or to both.

4.5.2 Vessel Noncompliance

4.5.2.1 Merchant Shipping Act

The MSA provides for both criminal and administrative sanctions.

i) Criminal Sanctions

The Act does not expressly provide a penalty for SO_x noncompliance. However, it prescribes a general penalty of a fine not exceeding ten million shillings (approx. USD 100,000) or to imprisonment for a term not exceeding ten years or to both, for offences for which no specific penalty is provided. Additionally, when the offence is a continuing one and no penalty is provided in respect of the continuance, every person who commits that offence, in addition to any other liability, shall be liable upon conviction to a fine not exceeding fifty thousand shillings (approx. USD 500) for every day or part thereof during which the offence continues after conviction.

The Act establishes that a body corporate, as the owner of the ship, and the Managing Director or any person acting in such capacity may be held liable in the prosecution of the offence where it is proved that such offence was committed with the consent of, or was attributable to any neglect on the part of a Managing Director or any person acting in such capacity.

ii) Administrative Sanctions

The Act establishes that where the Director General of the Maritime Authority is satisfied that a person has committed an offence under for which a fine is provided, and such person admits the commission of the offence in the prescribed form and

requests the Director General to deal with such offence, the Director General has the power to compound the offence and order the person to pay a sum of money as may be deemed fit, but not exceeding the amount of the fine that would have been imposed had the person been held liable on prosecution and convicted for the offence.

4.5.2.2 Environmental Management and Co-ordination Act

EMCA prescribes criminal sanctions for noncompliance with the established emission standards (see Table 5). Thus, any person who discharges any dangerous materials into the air commits an offence, and shall on conviction be liable to a fine not less than two million shillings (approximately USD 20,000) but not more than five million shillings (approximately USD 50,000).

4.5.2.3 Environmental Management and Co-Ordination (Air Quality) Regulations

The Regulations prescribes the ambient air quality limits (see Table 5) which all operators of marine and inland water transport must control. Failure to observe the prescribed limits is an offence.

Table 5: Ambient Air Quality Tolerance Limits for SO_x

Pollutant	Time weighted Average			
		Industrial Area	Residential, Rural & Other area	Controlled Areas****
SO _x	Annual Average*	80 mg/m ³	60 mg/m ³	15 mg/m ³
	24 hours**	125 mg/m ³	80 mg/m ³	30 mg/m ³

Source: Environmental Management and Co-ordination (Air Quality) Regulations (2014)

Noncompliance with the provisions of the Regulations may attract criminal and administrative sanctions. The Regulations provide that;

- i. a person who contravenes the provisions of the Regulations commits an offence and is liable on conviction to a fine of five hundred thousand shillings (approximately USD 5,000) or imprisonment for a term not exceeding six months; and
- ii. the Environmental Authority may, where it can demonstrate noncompliance, charge a person a penalty of ten thousand Kenya shillings (approximately USD 100) for every parameter not being complied with, per day, until such person demonstrates full compliance with the relevant standard.

4.6 Reception facilities

Kenya does not provide reception facility services to ships. In effect, there are no waste management regulations on reception facilities.

4.7 Conclusion

This chapter has discussed the national legal regime for ship-source sulphur emissions in Kenya. It is evident that Kenya uses both primary and subordinate legislation to regulate air emissions from ships.

The next chapter will study the institutions that implement and enforce these provisions.

CHAPTER 5: INSTITUTIONAL FRAMEWORK FOR VESSEL-SOURCE SULPHUR EMISSIONS

5.1 Introduction

This chapter discusses Kenya's institutional framework responsible for administering and enforcing the national provisions on vessel-source sulphur emissions. The institutions are as illustrated below. Their mandates are discussed *vis a vis* the actions required to implement and enforce the sulphur regulations.

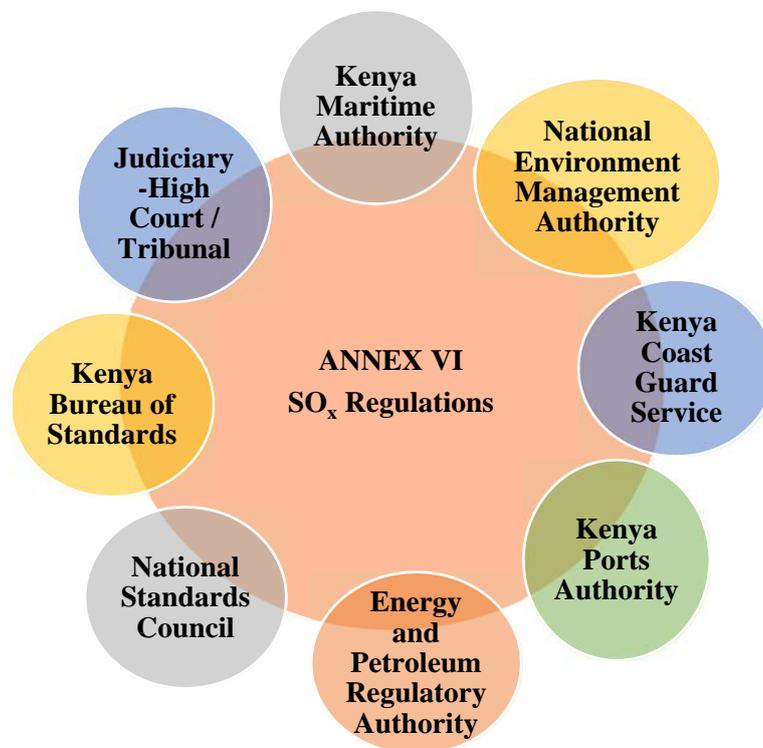


Figure 4: Institutional Framework for Vessel-Source Ship Emission

Source: Drawn by Muriithi, A. (2019).

5.2 Legislative Mandate

With regard to sulphur emissions, a State has a legislative mandate to, *inter alia*, prescribe instructions detailing the procedures to be followed in carrying out statutory certification and services; prescribe procedures for handling and approving equivalent

arrangement proposals; prescribe the period of validity of the IAPP certificate; prescribe a log-book to guide the recording of fuel-oil-change-over operations for ships operating in ECAs; and to prohibit violations and establish sanctions for violations of standards committed within their jurisdiction.

This mandate is under the charge of the Kenya Maritime Authority (KMA) and the National Environment Management Authority (NEMA).

5.2.1 Kenya Maritime Authority

The KMA is Kenya's maritime administration, established under the Kenya Maritime Authority Act (2006). It is a State agency in the Ministry of Transport, but under the State Department for Shipping and Maritime. It is headed by a Director General and its principal objects are to regulate, coordinate and oversee maritime affairs in Kenya.

KMA has a duty to advise the government on legislative and other measures necessary for the implementation of ratified conventions.

5.2.2 National Environment Management Authority

The NEMA is the environmental administration established under the EMCA, with the object of exercising general supervision and coordination over all matters relating to the environment, and to be the principal instrument of Government in the implementation of all policies relating to the environment. It is a State agency in the Ministry of Environment and is headed by a Director General.

NEMA has a duty to advise the Government on legislative and other measures for the implementation of relevant environmental conventions. Furthermore, it has the duty to initiate legislative proposals for such conventions for consideration by the Attorney-General for purposes of giving effect to the provisions of the Convention.

NEMA also has the duty to make recommendations to the Cabinet Secretary of the Ministry of Environment who sets the ambient air quality standards (see Table 5). Additionally, it must also periodically review the ambient air quality levels.

5.3 Issuance of Certificates

A State should survey its ships and issue the IAPP Certificate. This mandate is entrusted to the KMA.

5.3.1 Kenya Maritime Authority

The Director General of KMA is also the Registrar of Kenyan ships. Thus, the Director General has the power to appoint surveyors to survey ships to ensure compliance with the provisions of the MSA and the rules thereunder. With regard to the sulphur regulation surveys and certification, KMA has delegated these responsibilities to three recognised organisations (IMO, 2017a).

To guarantee the completeness and efficiency of the surveys and to maintain full responsibility for the IAPP Certificate, KMA has a formal written agreement with the ROs which, *inter alia*;

- i. outlines the applicable instruments for statutory certification surveys and issue of certificates, including the MARPOL Annex VI IAPP Certificate;
- ii. empowers the ROs to cooperate with PSC officers to facilitate rectification of reported deficiencies on behalf of the Administration;
- iii. provides for the sharing of information and liaison between the ROs and the Administration; and
- iv. provides a supervision clause for the Administration to satisfy itself of the quality systems of the ROs as required under Appendix 1 of the Annex to IMO Assembly Resolution A.739(18) and the Annex to IMO Assembly Resolution A.739(19).

5.4 Port State Control Inspections

PSC inspections in respect of the sulphur requirements are facilitated by three agencies. These are discussed below.

5.4.1 Kenya Maritime Authority

The KMA oversees PSC inspections. The Director General has the power to appoint inspectors who, under the MSA, have the power to board and inspect a ship at any reasonable time, and, *inter alia*, to demand the production of documents, records and other evidence; make such examination and investigation, take such measurements, photographs and samples of any articles or substances found in the ship and the atmosphere in the vicinity of the ship as may be necessary; and to take testimony of witnesses under oath, for the purpose of the inspection.

For sampling, the Minister of Transport is empowered to make regulations to prescribe the procedure to be followed in the taking of and dealing with samples.

5.4.2 National Environment Management Authority

The Director General of NEMA has the power to appoint environmental inspectors to monitor compliance with the required standards. Thus, environmental inspectors are granted the power to enter any vessel and make examinations and enquiries to establish compliance; require the production of, inspect, examine and copy registers, records and other relevant documents; and to take samples for tests and analysis.

For sampling, the Director General has the power to designate such number of analytical or reference laboratories as he may consider necessary. Furthermore, NEMA has the power to prescribe the standard or method of testing mobile source emissions, in consultation with the Kenya Bureau of Standards (KEBS).

5.4.3 Kenya Bureau of Standards

The KEBS is a standardisation agency established under the Standards Act. It is an agency in the Ministry of Industry, Trade and Cooperatives and is charged, *inter alia*, with the duty to promote standardization in industry and commerce; and to provide facilities for the examination and testing of any substance to determine whether it complies with the standards of quality or description.

With regard to fuel oil sampling, KEBS is ISO/IEC 17025 accredited since 1997 (KEBS, 2019). Thus, it has appropriate facilities to facilitate fuel oil sampling in PSC inspections.

5.5 Fuel oil Availability

A State is required to promote the availability of compliant fuel oil. This mandate is overseen by three institutions.

5.5.1 Kenya Ports Authority

The Kenya Ports Authority (KPA) is Kenya's port authority established under the Kenya Ports Authority Act (1978) to, *inter alia*, maintain, operate, improve and regulate the Kenyan ports. The Authority is under the Ministry of Transport, but under the supervision of the State Department for Transport.

The sulphur regulations require a port authority to undertake to provide or regulate the bunkering of compliant fuel oil. The KPA provides and regulates bunkering services at the Port of Mombasa through private oil marketing companies (KPA, 2019).

5.5.2 Energy and Petroleum Regulatory Authority

The Energy and Petroleum Regulatory Authority (EPRA) is an authority established under the Energy Act. It is an agency under the Ministry of Energy which is mandated, *inter alia*, to regulate the importation, transportation, storage and sale of petroleum; to investigate complaints or disputes arising from petroleum operations; and to develop guidelines on applicable treaties, conventions and protocols affecting the energy sector in consultation with other statutory authorities.

With regard to sulphur fuel oil requirements, EPRA has a duty to regulate and/or develop guidelines for the importation, transportation, storage and sale of LSFO and investigate complaints or disputes arising therefrom.

5.5.3 National Standards Council

The National Standards Council (Council) is established under the Standards Act to, *inter alia*, supervise and control the administration of the KEBS.

With regard to the sulphur fuel oil cap and the need to promote the availability of compliant fuel oils, the Council has a monitory mandate with the power to require every licensed supplier to furnish such samples of the commodity as may be requested in writing, and all such information in regard to the commodity within the specified period.

5.6 Enforcement

Enforcement relates to violations committed by fuel oil suppliers or ships.

5.6.1 Fuel Oil Suppliers

5.6.1.1 High Court

All offences committed against the provisions of the Energy Act and Standards Act fall within the jurisdiction of the High Court of Kenya. The High Court is established under the Constitution (2010) and is granted unlimited original jurisdiction in criminal and civil matters.

5.6.1.2 Energy and Petroleum Tribunal

The Energy Act establishes the Energy and Petroleum Tribunal to expeditiously hear and determine all civil matters referred to it relating to the energy and petroleum sector. Thus, the Tribunal has original civil jurisdiction on any dispute between a licensee and a third party or between licensees. A ship owner, charterer or operator may use this avenue to settle disputes on supply of noncompliant fuel oil.

5.6.2 Noncompliant Ships

5.6.2.1 Kenya Coast Guard Service

The Kenya Coast Guard Service (Coast Guard) is a service established under the Kenya Coast Guard Service Act (2018). The Service is under the Ministry of Defence. With regard to SO_x violations, the Coast Guard has jurisdiction to enforce pollution control in the territorial waters and to prosecute maritime offenders. Subject to the right of innocent passage, the Coast Guard has the power to stop, enter, board, search, inspect or detain a vessel for any act of pollution of the marine environment in the territorial sea.

The Service operates a 54-metre patrol vessel, MV Doria, with a top speed 35 knots, a helicopter deck of a five-ton helicopter, a crew capacity of 12 and a passenger capacity of 60 (Western Marine Shipyard Ltd., 2019). The vessel is mostly used to enforce maritime security, in search and rescue and in monitoring illegal, unreported, and unregulated (IUU) fishing. However, the vessel is not equipped with SO_x emission detection mechanisms to notify authorities of any violation.

5.6.2.2 Kenya Maritime Authority

KMA inspectors have the power to issue an improvement notice where a person contravenes one or more of the relevant statutory provisions in circumstances that make it likely that the contravention will continue.

The Director General and any inspector of KMA can issue an order for detention of a ship for a nonconformity and detain the ship.

Furthermore, offences under the MSA may be conducted by any KMA officer specially authorized in writing by the Attorney-General.

Additionally, the Director General of KMA can issue administrative fines to persons who admit the commission of an offence and requests the Director General to deal with such offence.

5.6.2.3 National Environment Management Authority

NEMA inspectors have the power to issue an improvement notice requiring the owner or operator of a vessel to take appropriate remedial measures within such reasonable time as may be prescribed.

Environmental inspectors also have the power to detain a vessel engaged in the commission of an offence.

Moreover, offences under the EMCA may be instituted and undertaken by an environmental inspector before a court of competent jurisdiction, when specially authorized in writing by the Attorney-General.

NEMA is also empowered to issue administrative fines where it can demonstrate noncompliance of standards set out in the Air Quality Regulations.

5.6.2.4 High Court

The High Court has jurisdiction to hear and determine offences committed against the provisions of the MSA, EMCA and Air Quality Regulations. It also has jurisdiction to hear and determine appeals against the administrative penalties imposed by the agencies.

5.7 Reception facilities

5.7.1 Kenya Ports Authority

The sulphur regulations require a port authority to undertake to provide a reception facility for ships to dispose of the exhaust gas cleaning residues. Presently, the KPA does not provide this facility to ships.

5.8 Conclusion

This chapter has discussed the institutional framework for vessel-source sulphur emissions in Kenya. There are various institutions with the mandate of implementing and enforcing the Annex VI sulphur regulations, including the Kenya Maritime

Authority which regulates, coordinates and oversees maritime affairs, the National Environment Management Authority which supervises and oversees environmental matters; the Coast Guard Service which enforces pollution control in the territorial sea; the Kenya Ports Authority as the operator of Kenyan ports; the Energy and Petroleum Regulatory Authority which regulates importation storage and sale of petroleum and protects consumer and stakeholder interests; the Kenya Bureau of Standards which promotes standardization in the industry; The National Standards Council which supervises the KEBS; and the Judiciary for the settlement of cases.

The next chapter will perform a legal gap analysis to establish where there is any lacuna in law or provisions that need to be updated or amended to conform with the international standards.

CHAPTER 6: ANALYSIS OF THE NATIONAL IMPLEMENTATION AND ENFORCEMENT OF MARPOL ANNEX VI SULPHUR REGULATIONS

6.1 Introduction

This chapter performs a legal gap analysis to identify whether there is any lacuna in law; whether there are provisions that need to be amended to conform with the international standards; and whether there are sufficient institutional structures in place to oversee the implementation and enforcement of the sulphur regulations. By analysing the MARPOL Annex VI sulphur provisions *vis a vis* the national provisions and the institutional mandates, the findings will espouse the weaknesses in the current implementation and enforcement regime.

6.2 Legislative Mandate

6.2.1 International Standards

A State is required to, *inter alia*, prescribe instructions detailing the procedures to be followed in carrying out statutory certification and services; prescribe procedures for handling and approving equivalent arrangement proposals; prescribe the period of validity of the IAPP certificate; and prescribe a log-book to guide the recording of fuel-oil-change-over operations for ships operating in ECAs through national laws and regulations.

6.2.2 National Provisions

Kenya regulates vessel-source sulphur emissions through various primary and subordinate legislation, including the MSA, EMCA, Air Quality Regulations, Energy Act and Standards Act. This notwithstanding, these provisions do not prescribe the procedures to be followed in carrying out statutory certification and services; the procedures for handling and approving equivalent arrangement proposals; the period of validity of the IAPP certificate; and a log-book to guide the recording of fuel-oil-change-over operations for ships operating in ECAs. This challenge can be attributed to the existence of scarce legal expertise to draft these technical provisions.

On sulphur emission standards, the Air Quality Regulations prescribes SO_x standards contrary to that specified in MARPOL Annex VI. While Annex VI prescribes the maximum limit of sulphur content in fuel oil as 0.50% m/m on and after 1 January 2020, the regulations have set annual and daily SO_x ambient air quality limits for designated areas including the industrial area, residential area and controlled areas (see Table 5). Furthermore, the regulations do not clearly specify whether the coastal waters constitute the controlled area.

6.2.3 Institutional Framework

Two institutions are charged with the legislative mandate. These are the KMA and NEMA. Both have a duty to advise the Government on legislative and other measures necessary for the implementation of ratified conventions. In addition, NEMA has a duty to initiate legislative proposals for consideration by the Attorney-General to give effect to the provisions of the Annex.

6.2.4 Findings

It can be observed that there is a lacuna in law on the requirements of the sulphur regulations due to scarce legal expertise. Furthermore, the SO_x standards set out in the Air Quality Regulations contradict the standards set out in Annex VI. In addition, there is duplication of mandates between different agencies creating conflicting responsibilities.

6.3 Issuance of Certificates

6.3.1 International Standards

To comply with the sulphur regulation, a State must periodically survey its ships and issue the IAPP Certificate which verifies that the condition of the ship is commensurate to that stated in the Certificate. Survey and certification may be undertaken by the Administration or delegated to recognised organisations or nominated surveyors. When such mandate is delegated to ROs, the flag State must, as a minimum:

- i. have a formal written agreement with the ROs specifying the scope of authorization, including, *inter alia*, relevant instruments and national legislation; surveys, issuance, withdrawal or cancellation of certificates, and corrective actions;
- ii. provide the RO with all appropriate instruments of national law giving effect to the provisions of the conventions;
- iii. issue specific instructions detailing the procedures to be followed in carrying out statutory certification and services; and
- iv. issue specific instructions detailing actions to be followed in the event that a ship is found unfit to proceed to sea.

6.3.2 National Provisions

The MSA establishes that officers of the Administration or authorised persons may at all reasonable times board, inspect and survey a Kenyan ship for purposes of conducting surveys required for certification for the purpose of ensuring compliance with the provisions of the Act.

6.3.3 Institutional Framework

The Director General of KMA is empowered to appoint surveyors to survey Kenyan ships to ensure compliance with the provisions of the MSA. With regard to the sulphur regulation surveys and certification, KMA has delegated these responsibilities to three recognised organisations (IMO, 2017a). As a minimum, KMA has a formal written agreement with the ROs which, *inter alia*;

- i. outlines the applicable instruments for statutory certification surveys and issue of certificates, including the MARPOL Annex VI IAPP Certificate;
- ii. empowers the ROs to cooperate with PSC officers to facilitate rectification of reported deficiencies on behalf of the Administration;
- iii. provides for the sharing of information and liaison between the ROs and the Administration; and

- iv. provides a supervision clause for the Administration to satisfy itself of the quality systems of the ROs as required under Appendix 1 of the Annex to IMO Assembly Resolution A.739(18) and the Annex to IMO Assembly Resolution A.739(19).

6.3.4 Findings

Although KMA has formal written agreements with the ROs, the agreements do not contain all the minimum elements set out in the RO Code, including:

- i. national law prescribing procedures for handling and approving equivalent arrangement proposals; and
- ii. national provisions detailing the procedures to be followed in carrying out statutory certification and services.

6.4 Port State Control Inspections

6.4.1 International Standards

With respect to the sulphur regulations, a port State officer should examine the following documents during initial inspections:

- i. the IAPP Certificate to confirm that the ship has been subjected to the necessary surveys;
- ii. the supplement to the IAPP Certificate to ascertain the ship's air pollution prevention equivalent arrangement;
- iii. the written procedures for fuel-oil-change-over operations where the ship operates in ECAs;
- iv. the BDN and the MARPOL Sample; and
- v. the notification issued by the ship to the flag Administration and the Competent Authority of the relevant port of destination when it cannot obtain compliant fuel oil, among others.

Where there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificates or documents, the PSC Officer may undertake a further inspection including, *inter alia*;

- i. sampling the fuel oil with the MARPOL sample in an ISO/IEC 17025 accredited laboratory;
- ii. where applicable, checking and verifying whether the exhaust gas cleaning system (EGCS) has been installed and operated in accordance with its approved documentation according to the survey procedures; and
- iii. verifying that the EGCS is properly functioning and, there are continuous-monitoring systems with tamper-proof data recording and processing devices.

6.4.2 National Provisions

PSC inspections in national context are guided by the MSA, EMCA and the IOMOU. The MSA and EMCA grant inspectors the power to board and inspect a ship at any reasonable time and, *inter alia*, to demand the production of documents, records and other evidence; take such measurements and samples as may be necessary; and take testimony of witnesses under oath, for the purposes of conducting inspection.

The IOMOU provides a harmonized port State control inspection procedure, including:

- i. a visit on board a ship to check the validity of the certificates, documents and furthermore satisfy that the overall condition of the ship and its equipment meet the provisions of the relevant instruments;
- ii. a more detailed inspection when the above conditions are not met;
- iii. the duty to ensure the rectification of all deficiencies detected or allow the ship to proceed to a port where any such deficiencies can be rectified;
- iv. when a ship is detained, the duty to immediately notify the flag State concerned; and
- v. to prevent undue detaining to a ship.

6.4.3 Institutional Framework

Three institutions are charged with the Port State Control responsibility. These are the KMA, NEMA and KEBS.

The Director General of KMA and NEMA respectively, have the power to appoint inspectors to carry out PSC inspections as required under the MSA and EMCA respectively. In respect of sampling, the Minister of Transport is empowered to make regulations to guide KMA in the taking of and dealing with samples. Conversely, the Director General of NEMA has the power to prescribe the standard or method of testing mobile source emissions and designate the number of analytical or reference laboratories as he may consider necessary.

The KEBS is ISO/IEC 17025 accredited thus facilitates fuel oil sampling in PSC inspections.

6.4.4 Findings

From the above, it can be observed that there is duplication of duties, conflicting responsibilities and fragmentation of duties in PSC inspections. Furthermore, there is no formal coordination between the three PSC inspection agencies.

6.5 Fuel Oil Availability

6.5.1 International Standards

States are required to take reasonable steps to promote the availability of compliant fuel oils in their ports and inform the IMO of such availability. States have to ensure that their appropriate authorities, *inter alia*, maintain a register of local suppliers of fuel oil; require local suppliers to provide the BDN and MARPOL sample, certified to meet the requirements of regulations 14 and 18; and require local suppliers to retain a copy of the BDN for at least three years for inspection and verification by the port State as necessary.

6.5.2 National Provisions

In the national context, the Energy Act establishes that EPRA shall monitor and enforce local energy content undertakings and, inter alia; oversee, coordinate, and manage the development of local content; set minimum requirements for local content in local content plans; and undertake local content monitoring, audit and enforcement.

Additionally, the Standards Act establishes a standards monitoring mechanism by empowering the National Standards Council with the power to request every licenced supplier to furnish such samples of the commodity to which the permit relates and all such information in regard to the commodity or its production, processing or treatment as may be specified in the request.

6.5.3 Institutional Framework

Three institutions have the mandate to ensure the availability of compliant fuel oil. These are the KPA, EPRA, NSC.

The KPA provides bunkering services at the Port of Mombasa through private oil marketing companies.

The EPRA develops guidelines on protocols affecting the energy sector in consultation with other statutory authorities; regulates the importation, transportation, storage and sale of petroleum; investigates complaints or disputes arising from petroleum operations; and undertakes local content monitoring, audit and enforcement.

The National Standards Council also undertakes local content monitoring.

6.5.4 Findings

It can be observed that there are no express legal provisions on MARPOL Annex VI fuel oil requirements. Furthermore, there is a duplication of the monitoring mandate. Moreover, there is no formal coordination between the three institutions to promote the availability of compliant fuel oil.

6.6 Enforcement

6.6.1 International Standards

The enforcement regime is twofold.

Member States are required to cooperate in the detection and enforcement of sulphur violations using practicable measures of detection and environmental monitoring.

Furthermore, Member States have a duty to prohibit violation of the sulphur standards and establish sanctions for noncompliance. Only monetary penalties may be imposed in respect of violations committed beyond the territorial sea. They must be adequate in severity to discourage violations and equally severe irrespective of where the violation occurs. To be adequate, they need to deprive economic benefits to perpetrators. Thus, a State is required to prescribe penalties with a range of minimum and maximum amounts so that fines are imposed on the basis of the severity of the offence; to define the basis for imposition of fines and define a reasonable period of computation.

6.6.2 National Provisions and Institutional Framework

In the national context, Kenya has prescribed penalties for noncompliance and established compliance monitoring and enforcement mandates.

6.6.2.1 Penalties *vis a vis* Enforcement Authorities

Kenya has various laws prescribing different penalties. There are criminal and administrative penalties which are imposed by the High Court and inspection authorities respectively. These are as summarised in Table 6 and 7 below.

Table 6: Penalties for Ship-Source Violations

No.	Legal Provision	Criminal Penalty (Issued by High Court)	Administrative Penalty (Issued by inspecting authorities)
1.	MSA	a general penalty of a fine not exceeding Ksh. 10,000,000 (approx. USD 100,000) or to imprisonment for a term not exceeding 10 years or to both, for offences for which no specific penalty is provided.	The Director General of KMA can order the payment of such sum of money as may be deemed fit, but not exceeding the amount that would have been imposed by Court.
		A fine not exceeding Ksh. 50,000 (approx. USD 500) per day or part thereof during which an offence continues after conviction, when the offence is a continuing one and no penalty is provided in respect of the continuance.	
		A fine not exceeding Ksh. 250,000 (approx. USD 2,500) or to imprisonment for a term not exceeding 15 months or to both for noncompliance with an improvement notice	

2.	EMCA	A fine not less than Ksh. 2,000,000 (approx. USD 20,000) but not more than Ksh. 5,000,000 (approx. USD 50,000)	
3.	Air Quality Regulations	A fine of Ksh. 500,000 (approx. USD 5000) or imprisonment for a term not exceeding 6 months	The Director General of NEMA can issue a penalty of Ksh. 10,000 (approx. USD 100) per day for every parameter not being complied with

Source: Tabulated by Muriithi, A. (2019).

Table 7: Penalties Against Fuel Oil Suppliers

No.	Legal Provision	Criminal Penalty (High Court)
1.	Energy Act	Any person who makes a false statement commits an offence and shall, on conviction, be liable to a fine not exceeding ten million shillings (approx. USD 10,0000) or imprisonment for a term not exceeding five years or to both. A general penalty of a fine not less than one hundred thousand shillings (approx. USD 1,000) where the Act fails to provide a fine for a contravention.
2.	Standards Act	Any person who fails to furnish the samples required within the specified period is guilty of an offence and liable to a fine not exceeding fifty thousand shillings (approx. USD 500) or to imprisonment for a term not exceeding six months, or to both.

Source: Tabulated by Muriithi, A. (2019).

6.6.2.2 Compliance Monitoring and Enforcement Authorities

Three institutions have the monitoring and enforcement mandate. These are the KMA, NEMA and Coast Guard.

i) Kenya Maritime Authority

The KMA has an overall mandate to oversee maritime affairs. This includes monitoring of violations. However, due to financial constraints, the KMA has no initial emission detection measures at sea.

On enforcement, KMA inspectors have the power to issue an improvement notice to a ship; to issue an order for detention; and to conduct proceedings for offences committed by a ship when specially authorized in writing by the Attorney-General.

ii) National Environment Management Authority

Like KMA, NEMA, although charged with responsibility to supervise all matters relating to the environment has no at sea emission detection measures.

Furthermore, on enforcement, NEMA officers have the power to issue an improvement notice to a ship; to detain a ship; and to conduct proceedings for offences committed by a ship when specially authorized in writing by the Attorney-General.

iii) Kenya Coast Guard Service

The Coast Guard enforces pollution control in the territorial waters. It operates a patrol vessel. However, the vessel is not equipped with SO_x detection measures.

Like KMA and NEMA, Coast Guard officers have the power to prosecute maritime offenders.

6.6.3 Findings

From the above, the following can be observed:

- i. Due to financial constraints, Kenya does not have at sea SO_x emission detection mechanisms that may aid in deterring violations and in the calculation of penalties.

- ii. In respect of ship noncompliance, different laws prescribe penalties for similar violations, making it difficult to ascertain which penalty will be imposed.
- iii. The prescribed penalties are relatively low, thus only suitable for small scale emission violations, but not severe cases. The legislation do not prescribe adequate minimum and maximum amounts so that fines are imposed on the basis of the severity of the offence. Furthermore, they do not define the basis for imposition of fines and their reasonable period of computation.
- iv. There are no specific penalties directed to fuel oil suppliers who supply fuel oil that contradicts that stated in the BDN. Furthermore, the prescribed penalties are relatively low to discourage noncompliance, considering the transboundary nature of shipping and the duty to protect the marine environment.
- v. The monitoring and enforcement agencies have duplicate and conflicting mandates. Furthermore, there is no formal coordination between the agencies.

6.7 Reception facilities

6.7.1 International Standards

As some ships will be fitted with EGCS as equivalent arrangements to achieve the SO_x regulation requirements, Annex VI requires States to undertake to provide reception facilities for ships to dispose of the residues produced from their operation.

Establishing a reception facility requires the development of a waste management strategy which involves the simultaneous provision of administrative and legal standards to guide and monitor the handling of wastes; the use of modern waste management technology; and the establishment of infrastructure and support services within and outside the port (IMO, 2016).

6.7.2 National Provisions

Presently, Kenya does not provide reception facility services to ships for exhaust gas cleaning residues. In effect, there is no waste management strategy in place, including

administrative and legal guidelines, waste management technology and the necessary infrastructure and support services within and outside the port to manage the exhaust residues.

6.7.3 Institutional Framework

Although the KPA has been charged with the mandate to maintain, operate, improve and regulate the Kenyan ports, it does not provide the reception facilities due to financial constraints.

6.7.4 Findings

In conclusion, Kenya does not provide a reception facility at its port due to financial constraints.

6.8 Conclusion

From the above, it is evident that Kenya faces the challenge of lacuna in law and insufficient regulatory provisions and written procedures to guide the implementation and enforcement of MARPOL Annex VI sulphur regulations. Furthermore, there are duplication of duties, conflicting responsibilities and fragmentation of duties between different agencies. Moreover, there is no formal coordination between the agencies. Taking this into account, the next chapter will suggest alternatives that may be undertaken to improve implementation and enforcement ahead of the 1 January 2020 global 0.50% m/m sulphur cap.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

This dissertation set out to identify the actions needed to implement and enforce MARPOL Annex VI sulphur regulations in Kenya and to identify the weaknesses in the current implementation and enforcement regime. In addition, it also aimed to determine the extent to which the sulphur regulations have been implemented in the laws of Kenya; whether the legislation in place are sufficient or contradictory to the international standards; and whether the institutional framework is sufficient to administer and enforce the sulphur regulations. To demonstrate this, the study addressed the following questions:

- i) What measures has Kenya taken to tackle air pollution from ships?
- ii) How does Kenya regulate Annex VI sulphur regulations?
- iii) How are sulphur emission violations established?
- iv) What enforcement measures are in place in the event of a noncompliance?

To achieve the aims and objectives of the study and to answer the research questions, this study was tailored into five themes which are crucial to the implementation and enforcement of the MARPOL Annex VI sulphur regulations. The themes include the issuance of certificates, port State control (PSC) inspections, fuel oil availability, enforcement regime and reception facilities. On issuance of certificates, a State has the legislative, survey and certification mandates. A State also has to perform PSC inspections to verify compliance with international standards. Furthermore, a State has a duty to promote the availability of compliant fuel oil in its jurisdiction. Moreover, for enforcement, a state must prohibit violations and establish sanctions, and also have compliance monitoring measures in place. A State should also undertake to provide reception facilities for the reception of exhaust gas cleaning residues. The study also reviewed the international regime of vessel-source sulphur emissions, to delimit these obligations in the different maritime zones.

To describe implementation and enforcement in the national context, the study looked into Kenya's national regime and institutional framework *vis a vis* each theme. It then undertook a comprehensive legal gap analysis for each theme, setting out international requirements *vis a vis* the national provisions and establishing the institutions which have a mandate. The findings can be summarized as below:

1. Legislative Mandate

Due to scarce legal expertise, there exists a lacuna in law on some of the requirements of the sulphur regulations including, provisions on the procedures to be followed in carrying out statutory certification and services; the procedures for handling and approving equivalent arrangement proposals; the period of validity of the IAPP certificate; and a log-book to guide the recording of fuel-oil-change-over operations for ships operating in ECAs.

The SO_x standards set out in the Air Quality Regulations are inconsistent with the standards set out in Annex VI.

In addition, there is a duplication of the legislative mandate between the KMA and NEMA, creating conflicting responsibilities.

2. Issuance of Certificates

Due to scarce legal expertise, the RO agreements do not contain all the minimum elements set out in the RO Code, including national law prescribing procedures for handling and approving equivalent arrangement proposals and national provisions detailing the procedures to be followed in carrying out statutory certification and services.

3. Port State Control Inspections

The agencies which facilitate PSC inspections (KMA, NEMA and KEBs) have related and fragmented duties which may occasion a conflict in responsibilities during inspections. Furthermore, there is no formal coordination between the three PSC inspection agencies.

4. Fuel Oil Availability

There are no express legal provisions for the MARPOL Annex VI fuel oil requirements. Furthermore, there is a duplication of the monitoring mandate between the EPRA and the National Standards Council and no formal coordination mechanism.

5. Enforcement

Due to financial constraints, Kenya does not have at sea SO_x emission detection mechanisms that may aid in deterring violations and in the calculation of penalties. In addition, the monitoring and enforcement agencies (KMA, KPA, Coast Guard) have related, thus conflicting mandates. Furthermore, there is no formal coordination between the agencies.

With regard to violations committed by ships, different laws prescribe penalties for similar violations, making it difficult to ascertain which penalty will be imposed. Moreover, the penalties are relatively low, thus suitable for small scale, but not severe cases of emission violations.

As regards fuel oil suppliers, there are no specific penalties directed to suppliers who supply fuel oil that contradicts that stated in the BDN. Furthermore, the prescribed penalties are too low to discourage noncompliance, considering the transboundary nature of shipping and the duty of a State to protect the marine environment.

6. Reception facilities

Kenya does not provide a reception facility at its port due to financial constraints.

Kenya needs to remedy these weaknesses to improve the implementation and enforcement of the MARPOL Annex VI sulphur regulations.

7.2 Recommendations

In view of the actions needed to implement and enforce MARPOL Annex VI sulphur regulations, Kenya should endeavour to address the abovementioned weaknesses by considering the following:

1. To improve the discharge of the legislative, administrative and enforcement mandates, Kenya should increase the human resource expertise in the relevant institutions through organising capacity building workshops, providing individual fellowships and strategic partnerships with maritime research and training institutions and the Maritime Technology Cooperation Centre for Africa.
2. To improve the implementation of the sulphur regulations, Kenya should introduce a comprehensive marine environment protection legislation to transpose the provisions of MARPOL and its Annexes, including Annex VI into national law. Furthermore, the contradictory Air Quality Regulations provision should be revised.
3. Once the relevant technical procedures are drafted, the Administration should amend its agreements with the various recognized organisations so as to meet the requirements of the RO Code.
4. With regard to penalties on vessel-source noncompliance, the penalties prescribed in the various legislation should be revised and harmonised. The penalties should also be bolstered to deter violations by giving both minimum and maximum penalty amounts, defining the basis for imposition and providing a reasonable period for computation.
5. Comprehensive provisions should be formulated to regulate fuel oil suppliers. Adequate penalties should also be prescribed to discourage noncompliance by fuel oil suppliers.
6. To remedy the duplication and fragmentation of mandates between multiple agencies with specific regard to the legislative, port State control, fuel oil availability promotion, and the monitoring and enforcement mandates, the relevant institutions should formulate an implementation, compliance monitoring and

enforcement strategy that establishes clear lines of responsibilities and a sound and robust interagency coordination mechanism to achieve compliance with Annex VI sulphur regulations.

7. To facilitate monitoring and enforcement by use of initial emission detection measures, Kenya may seek financial assistance from international financial institutions or through strategic partnerships on technology transfer.
8. Kenya may undertake to provide reception facilities either through employing the private sector through a comprehensive licensing system identifying the waste acceptance, treatment and disposal standards, or through Government initiative. The Government may seek support from international donor organisations to establish the facilities.

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