Preventing Sulphur Emissions from Ships through IMO’s MARPOL Annex VI – Significance, Challenges and Limitations

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1 Introduction

1.1 Topic and Scope

The topic of this thesis is Annex VI to the International Convention for the Prevention of Air Pollution from Ships (MARPOL 73/78) developed by the International Maritime Organization (IMO). The objective of this thesis is to investigate the Sulphur limit in fuel obligation under Annex VI, and more specifically examine the obligations upon private shipping actors, flag and coastal/port states. Complying to and enforcing Annex VI is no easy task, and saying there is no easy sailing is well suited in this context. The implications are numerous and complex, and this thesis will highlight and target these implications, both practical and legal. Furthermore, it is of interest to detect weaknesses and limitations of the enforcement regime under MARPOL. Thus, the focus will mainly be on the sulphur requirement, however, some of the considerations will also be relevant to the other air emission requirements under Annex VI.

The scope of the thesis will be limited to ships operating internationally which are the subjects to MARPOL. Ships operating domestically will be left out, whereby MARPOL will not apply within jurisdictions of non-parties. In addition, the thesis will be limited to international regulations. Domestic legislation bringing the proceedings after violations are detected and established, will not be discussed, although some general points will be raised.

Annex VI entered into force in 2005 and has since then been subject to amendments increasing the requirements for emissions from ships globally and within certain Emission Control Areas (ECAs). Before 2005 there were no international rules in force regulating emissions from ships. When the sulphur requirements were first introduced, they were not very ambitious. They required ships to use fuel oil containing sulphur of maximum 1.5% m/m (mass by mass) within the ECAs and 4.5 % m/m as the global limit. The global limit did not put much pressure on the industry as the three-year rolling average sulphur content in residual fuel for 2006 to 2008 was 2.46%. Today, the limit within ECAs are 0.1% m/m and the global limit is 3.5% m/m, and in October 2016 a ground-breaking decision was made; after 1 January 2020, the global sulphur limit in fuel will be 0.5% m/m. Annex VI do allow for alternative compliance methods,

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1 Annex VI Reg. 14(1)(3)
2 Annex VI Reg. 14(4)(1) and 14(1)(1)
3 MEPC 61/4 Section 10
4 Annex VI Reg. 14(4)(3) and 14(1)(2)
5 Resolution MEPC. 280(70) Section 1. and Annex VI Reg. 14(1)(3)
such as exhaust gas cleaning systems (“scrubbers”), but it is required that they are at least as efficient.6

The switch to a 0.5% sulphur limit in fuel means a huge turnover for the maritime industry. There are various uncertainties over the effect the regulations will have. Fuel oils with low sulphur content are significantly more expensive than the high sulphur content oils, and installing scrubbers is a huge financial expense for shipping owners. Marine and Energy Consulting Ltd has estimated an average annual costs in the area of $24 billion for the industry over the decade starting in 2020.7 Owners and charterers will not only have to deal with those costs, but also the practical and legal implications that Annex VI bring. Governments are also facing challenges. For the rules to be effective, one relies on port and flag states to create an efficient enforcement regime. The direction of a greener shipping industry and increased environmental awareness is inevitable, the question is how to handle the hurdles that comes along with it in respect of the sulphur limitations.

One can claim that air pollution from ships might be one of the hardest areas to impose and enforce regulations. First, the problem is “invisible” because it is out of sight. Enforcing environmental requirements upon polluters is relatively easy whenever the pollution has an immediate and visible effect on the environment, especially close to populated areas. Global shipping, however, takes place mainly where no one can see or experience the immediate effect of the air pollution. Second, ships spread their emissions, as opposed to a stationery factory. Third, air emissions are continuous, hence operational emissions, unlike accidental “incidents” such as oil spills or gas leaks. These differences from many other types of pollution makes it difficult to quantify the amount and proving non-compliance. Increased surveillance and monitoring of vessels’ emissions is crucial to both imposing regulations and dealing with violations.

The fact that IMO develop the substantive legislation to be applied by all is an important element to successful implementation. This way of developing international rules differs from other international efforts, such as those attempting to lower greenhouse gasses. As an illustrative comparison, the Kyoto Protocol and the Paris Agreement has not been as successful as one would hope.8 Those instruments simply set out goals regarding emission limits for each country. Each state can choose what industry to target, and this can potentially result in an unaligned practice meaning different rules applying to actors within the same industry. This is unfortunate for fair competition. With Annex VI, the issue is tackled differently. Developing the same standards for all in one particular industry makes the business predictable and lets all actors

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6 Annex VI Reg. 4  
7 IBIA (2017)  
8 Nwankwo (2018)
compete at equal grounds. Of course, this will only be the case if the instrument can be implemented and enforced efficiently.

There are many elements to a successful treaty. The previous Secretary-General of IMO, Mr Koji Sekimizu, summed it up well: “For an IMO convention to be properly effective, it needs early entry into force, widespread ratification, effective implementation, stringent oversight of compliance and vigorous enforcement. Even those conventions that command almost universal coverage of the global fleet, such as SOLAS and MARPOL, only have teeth if they are backed up by an effective implementation infrastructure at the national level.”

Legislation and regulations from IMO have been very successful in the sense of being widely recognised by the global community. However, it is up to each member state to implement and enforce these regulations by making sure that ships registered under their flag comply with the regulations, and moreover, control the vessels entering their coastal waters. States must have the legal instruments, technical and practical tools, and control mechanisms in place for the regulations to be efficient.

The quality of implementation and enforcement at national level differs. However, provided that all countries did strictly implement the enforcement regime of MARPOL, are the measures sufficient to control sulphur emissions from ships? There are some challenges due to fact that lowering sulphur emissions is purely dependent upon the quality of fuel oil, unless there is abatement technology installed. A minimum is that the ship itself is in a condition to burn compliant fuel oils or have installed alternative technology, which flag states are able to ensure during surveys. Nevertheless, controlling whether ships actually burn compliant fuel oil will mainly be a task for the port states. If enforcement is not conducted in a sufficient way, the risk is that some ships might consider a breach more profitable than compliance. Moreover, those that are set on complying, risk being put in an economically disadvantageous position.

When enforcing the rules, states must also take into consideration other international frameworks. Controlling and imposing sanctions upon foreign ships in some circumstances will be limited by the international law of the sea contained within the United Nation Conference on the Law of the Sea (UNCLOS). Hereunder, jurisdictional limitations, and other principles such as the right of innocent passage. At the high seas the enforcement authority is the flag state, and their possibilities of controlling compliance and discover non-compliance is limited. The private shipping actors’ approach and attitude towards the new regulations will be essential to creating a culture of compliance. But again, to develop such culture, the governments need to take action and create effective incentives for compliance.

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9 IMO News (2014) p. 5
1.2 Sources

The central legal source of this thesis is the main body of MARPOL, Annex VI and the belonging appendices. The text of the convention is the primary source when establishing the legal obligations of member states,\textsuperscript{10} i.e. the flag and port states’ obligations to implement and enforce. Annex VI sets out the substantive law applying not only to ships of the party states, but also to ships of non-party states which operates within jurisdictions of party states. Guidelines developed by the Maritime Environment Protection Committee (MEPC) are also important sources. They are “soft law”, and not binding instruments per se, but in practice heavily relied upon by most of the member states and are sometimes referred to in the convention text as mandatory. In addition, IMO documents on the workings of MEPC are used as a tool to understand the reasoning behind their instruments and regulations.

The United Nations Law of the Sea (UNCLOS) is the central source under the chapter on jurisdictional limitations on port/coastal state control. The considerations made are inspired by Henrik Ringbom’s article “Enforcement of the sulphur in fuel requirements: the same, only different” which raises many of the same questions.

The sources used to establish the traditional allocation of responsibility between Owners and Charterers are standard contracts such as New York Produce Exchange Form (“NYPE”) and SHELLTIME 4 Standard Form for time charters. These do, naturally, not address the transitioning period changing to 0.5% sulphur fuel oil 1 January 2020. How issues surrounding the changeover are solved is primarily a matter of negotiation with the basic principles of responsibility in mind set out in these contracts. New clauses addressing Annex VI and the transition period are developed by BIMCO and INTERTANKO. These are likely to be incorporated in charter parties by many actors.

Since this thesis also considers practical implications of the regulations both for the subjects of the rules and the environment, a wide variety of research articles, news articles and reports are included as additional sources.

1.3 The Further Content

\textsuperscript{10} Sands (2012) p. 96
Annex VI is developed with the primary concern of human health, but also the concern of the environment. Some background on why preventing sulphur oxide emissions is necessary and the environmental impact is explained under chapter 2.

A review of IMO’s structure and vigorous law-making process will be made under Chapter 3. IMO has and will continue to have a huge impact on the shipping industry. Every actor in international shipping must continuously adapt to their standards and requirements. How the regulations are developed and some of the following challenges is worth an examination.

Chapter 4 is the essential chapter. The sulphur emission regulations under MARPOL Annex VI poses several implications. What the obligations upon Owners and Charterers are and how they must adapt to be in compliance, will be examined under 4.2. The sulphur regulations do not only pose challenges for the shipping operators. Flag and coastal states must also be able to enforce them in order for them to be effective. How the rules are to be enforced by states under MARPOL and what jurisdictional limitations and opportunities there might be, will be discussed under 4.3 and 4.4.

As chapter 4 is diving into the international requirements and their practical implications, Chapter 5 will be raising some of the potential legal issues between owners and charterers caused by the changeover to 0.5% sulphur content in fuel on 1 January 2020. Finally, chapter 5 will summarise and raise some conclusive remarks.

2 Background

2.1 Air Pollution from Ships and Annex VI's Significance

Shipping, like all modes of transportation that uses fossil fuels, contributes to air pollution. Contrary to land-based industries, air pollution from shipping has up until recently not been regulated at all, and vessels have been able to burn the cheapest fuel oils available with no regard to the environmental impact. Heavy fuel oils are the most used as marine fuel because it is cheap and marine engines are designed to burn practically all types of fuel without clogging. Heavy fuel oil is a residual fuel incurred during the distillation of crude oil.\footnote{Bomin Group (2015)} To achieve various specifications and quality levels, these residual fuels are blended with lighter fuels such as marine gasoil or marine diesel oil.\footnote{Bomin Group (2015)}
From a pure commercial standpoint, there are great economic benefits to leaving emissions from ships unregulated. Using heavy fuel oil for shipping is a convenient and efficient way to dispose of it, plus it is also one of the reasons why it has become so cheap shipping goods and industrial commodities around the world. However, the economic benefits come with a high environmental cost. The combustion of heavy fuel oil release a handful of pollutants into the atmosphere which has an adverse effect on the environment and public health, especially in populated areas close to heavily trafficked shipping lanes. These pollutants are mainly sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) and heavy metals, and chlorofluorocarbons (CFCs). Annex VI of MARPOL is developed with the aim of lowering or preventing these emissions.

SOx and NOx emissions are the main causes of acid rain, which, as shown below, has adverse effects on human health and environment. The ECAs are developed because of these detrimental effects. States party to Annex VI recognize under “Objectives” of Appendix III of Annex VI that emissions of NOx, SOx and particular matter are associated with “adverse public health and environmental effects […] include premature mortality, cardiopulmonary disease, lung cancer, chronic respiratory ailments, acidification and eutrophication.”

Today, the global shipping fleet consumes around 4 million barrels of high sulphur fuel oil per day. A change to lower sulphur content fuel oil will be of huge significance to human health and the environment. Even though the cost for the industry is very high, the EU Commission has done several cost-benefit considerations showing that imposing these sulphur limitations are very cost-efficient. Health gains amount to the benefit, increasing fuel prizes amounts to cost. Moreover, environmental benefits are not even taken into account in these analysis.

2.2 The Adverse Effects of Sulphur Emissions

2.2.1 Acid rain and Ocean Acidification
Combustion of heavy fuel oil emits high amounts of sulphur oxides (SOx) which causes air, water and land pollution. SOx, along with NOx, emissions is one of the primary causes of acidification of rain water causing acidification of oceans and serious damage to wildlife and

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13 Munawer (2018) p. 88
14 Appendix III cl. 1(1.2)
16 The Government (2013)
17 The Government (2013)
18 Munawer (2018) p. 88
vegetation. Rain is considered acidic when the pH level is below the normal level of 5.6. The acidic rain can fall thousands of kilometres from the original source of emission, hence ships’ sulphur emissions effects not only the immediate surrounding oceanic environment, but also the environment at land.

2.2.2 Ocean Acidification
SOx emissions contributes to the decrease of pH levels of the oceans. This ongoing process is called ocean acidification. When SOx (as well as CO2) dissolve in the ocean it changes the chemistry of the seawater. Even small pH changes can be detrimental to the vulnerable biological life in the oceans because marine life has not developed protective mechanisms against fluctuating pH values beyond the natural limits.

Annex VI permits ships installing exhaust gas cleaning systems as an alternative compliance method. Open loop scrubbers are one of those options. As will be explained in more detail under 4.2.3, the concern with the open loop scrubbers is that they discharge the residues from the exhaust gas cleaning process in the form of an acidic jet directly into the ocean. This contributes to ocean acidification, and moreover, influence the capacity of sea water to resist the changes in pH levels. The more SO2 that is released into the ocean, the lesser capacity the ocean has to absorb CO2.

By installing open loop scrubbers one avoids sulphur air emission; hence complying with the regulation, but instead dumps the detrimental acidic waste into the oceans. One can wonder why this is permitted under Annex VI when there are other alternatives, such as closed loop scrubbers. (see 4.2.3.2).

2.2.3 Deprivation of Land Based and Freshwater Ecosystems
There has been conducted a lot of research on the effects of acid rain on land based ecosystems which all show the adverse influence. Soil, forest trees, lower plants, crop plants, streams and lakes are all negatively affected. Soil is one of the most important ecological factors, and acidification leads to nutrient deficiency and loss of soil fertility which again leads to a decrease in

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19 Singh (2008) p. 15
20 Nestaas (2019).
21 Singh (2008) p. 15
22 EU Science Hub (2016)
23 EU Science Hub (2016)
24 EU science Hub (2016) and Ocean Portal (2018)
25 EU Science Hub (2016)
26 EU Science Hub (2016)
the growth of trees, plants and lower plants such as algae, fungi and lichen. Because of changes in soil properties, microorganisms and microbial processes are affected. The flora itself is also directly affected leading to plant tissue damage and forest growth is decreased.

Streams and lakes are even less resistant against acidification than soils and plants. All components of aquatic ecosystems are affected. Species has different levels of tolerance to acidity. Experience has shown that particularly sensitive species such as frogs, toads, salamander, snails and phytoplankton decrease at pH levels below 5.5, and below 4.0 all stock fish will decline rapidly due to embryos failing to mature.

All these elements are crucial for a balanced ecosystem. If emissions are prevented, acidity can return to normal, however, the recovery of the affected ecosystems is slow, and whether they can fully return to a pre-acid rain condition is uncertain. Therefore, it is so crucial to lower SOx emissions wherever and as soon as possible.

Increased research on the effects of air pollution on the marine environment and public health has now led to much needed global legislation. Reducing SOx and NOx emissions is the most important solution to acid rain. Much thanks to the law-making process of IMO, the revised Annex VI contains stringent restrictions which, finally, is forcing a green shift in the marine industry.

3 IMO and Their Law-Making Process

3.1 Institutional Structure

3.1.1 The Organization
The International Maritime Organization (“IMO”) is an inter-governmental organization and a specialized agency of the United Nations (UN) in the field of shipping and the effect of shipping on the marine environment. The organization is based in London and is the global authority for setting standards for the safety, security and environmental performance of international

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27 Singh (2008) p. 18 and 20
28 Singh (2008) p. 20
29 Singh (2008) p. 19
30 Singh (2008) p. 18
31 Burns (2016) p. 3
33 IMO (2019a) and IMO Convention Art. 59
IMO develops the regulatory framework for the shipping industry and facilitates the adoption and implementation of that framework. The organization was established in 1948, before environmental matters became an issue for the international community. The objective then was to enhance maritime safety and technical cooperation. Today, creating universal legislation to promote environmental performance is one of their main areas of focus.

The Convention on the International Maritime Organization (IMO Convention) is the core instrument establishing the Organization. It was adopted in 1948 and entered into force in 1959. To become a member of the organization, states must ratify the IMO Convention. Only states can become “members” as defined by the convention. Currently there are 174 members, which represent all states with a significant merchant fleet. There are to date three associate members. They have the same rights and obligations as member states but does not have the right to vote as they are special autonomous territories of other states.

### 3.1.2 Cooperation with the UN and other International Organizations

IMO is a legally independent organization with their own rules, membership, organs and financial resources. However, when producing international law, cooperating with other international law-making institutions is crucial. The instruments must fit within the existing international legal framework and the law-making process coordinated with other law-making organizations, at least where legal areas touches upon one another.

For example, IMO instruments must correspond with the United Nation Conference on the Law of the Sea (UNCLOS). UNCLOS is a framework convention. It contains several clauses of a general kind that refers to regulations developed by the “competent international organization”. IMO is such competent organization, and hence, in some circumstances, requirements under IMO instruments will be binding upon state parties to UNCLOS, even if they are not party to the IMO instrument.

Provisions under the IMO Convention provides for this cooperation. Article 59 brings IMO into relationship with the UN as in accordance with Article 57 of Charter of the United Nations (UN Charter), making IMO one of their Specialised Agencies. The relationship is effected through

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34 IMO (2019a)
35 IMO (2019b)
36 IMO Convention Art. 8 and 9
37 UN Systems (2016) “Specialized Agencies”
38 Secretariat of IMO (2014) p. 8
39 Secretariat of IMO (2014) p. 10
the ECOSOC Resolution 165 (VII). Among other things, it establishes the mutual right to partici-
participate in each other’s decisions.\textsuperscript{40} IMO is also obliged to cooperate with “any specializes agency of the United Nations in matters which may be the common concern”\textsuperscript{41}.

In addition to the UN and their specialised agencies, IMO cooperates with other intergovern-
mental organizations “whose interests and activities are related to the purposes of the Organi-
zation”.\textsuperscript{42} To date, there are 64 intergovernmental organizations which have signed agreements of cooperation with IMO.\textsuperscript{43}

IMO may also “make suitable arrangements for consultation and cooperation”\textsuperscript{44} with NGOs. In order for NGOs to be granted consultative status, they have to be able to make a substantial contribution to the work of IMO. They must demonstrate considerable expertise within its field of competence and be international in the sense of having a range of members covering a broad geographical scope.\textsuperscript{45} Currently there are 81 NGOs in consultative status.\textsuperscript{46} Some examples are Greenpeace International and other environmental organizations, the International Association of Classification Societies, the International Bunker Industry Association, the International Federation of Shipmasters’ Association and the International Association of Independent Tanker Owners. All the IGOs and NGOs represent a broad spectrum of interests in the shipping industry. Influence and knowledge from them enable IMO to consider all sides to help produce optimal legislation.

3.1.3 Structure of IMO and MARPOL Annex VI

The IMO Convention establishes the structure of IMO. The organization consist of the Assembly, a Council, a Secretariat and several committees and sub-committees. The main Committees are the Legal Committee, Maritime Safety Committee and the Technical Co-Operation Committee and the Marine Environment Protection Committee (“MEPC”).\textsuperscript{47} These committees produce and adopt instruments such as conventions, protocols, resolutions, recommendations and guidelines. The conventions, protocols and resolutions are the legally binding instruments upon the parties.

\textsuperscript{40} ECOSOC Art. II
\textsuperscript{41} IMO Convention Art. 60
\textsuperscript{42} IMO Convention Art. 61
\textsuperscript{43} IMO (2019c)
\textsuperscript{44} IMO Convention Art 62
\textsuperscript{45} IMO (2019c)
\textsuperscript{46} IMO (2019c)
\textsuperscript{47} IMO Convention Art. 11
MEPC was established by the IMO Assembly in 1975 and is responsible for coordinating the Organisation’s activities in the prevention and control of pollution of the environment from ships. MEPC consist of all members of the IMO. An important sub-committee to MEPC is the subcommittee on Pollution Prevention and Response (PPR) which consider technical and operational matters assisting the workings of MEPC.

MEPC composes MARPOL which is one of IMO’s key conventions and is widely recognised with 157 contracting states as of March 2019. There are six annexes to MARPOL containing the substantive law, each tackling different types of pollution from ships. Annex VI addressing air pollution was adopted through the 1997 Protocol and was added to the 1973 Convention (MARPOL). Annex VI is today ratified by 93 countries, which is the combined merchant fleets of which constitute approximately 96.68% of the gross tonnage of the world's merchant fleet.

Furthermore, it is stipulated under MARPOL Article 5(4), that the Parties shall also “apply the requirements […] as may be necessary to ensure that no more favourable treatment is given” to non-Parties to the convention. This means that all ships engaged in international voyages must adapt to the regulations. Even those ships sailing the flag of a non-signatory state must comply with the rules whenever entering the territory of a state party to Annex VI. This is a significant provision and makes it harder for countries to be outsiders to MARPOL, at least for those with an international merchant fleet. This is one of the reasons why the convention is widely recognised. One might as well join the global community in practicing unified requirements. The result of this is that MARPOL requirements at all times represents the minimum standards of the maritime industry.

### 3.2 Law-making process

IMO’s regulations on air pollution from ships has developed rapidly, considering there were no regulations at all 14 years ago, at least not in force. The regulations today and the new limit coming into force 1 January 2020, which will be examined under chapter 3, are ambitious and demanding upon member states, shipping actors and fuel suppliers. Compared to other international efforts at creating global legislation on air emissions, Annex VI have so far proven very successful. How come IMO has been able to develop such progressive widely recognised international rules? One of the reasons lies in their law-making process.

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48 Sands (2012) p.72 and IMO Convention Art. 37  
49 Karim (2015) p. 27  
50 IMO (2019b)  
51 IMO (2019d) p. 170
3.2.1 Entry into force – Conventions, Protocols and Optional Annexes

In order for an IMO Convention or Protocol to enter into force, there are normally two requirements; it has to be ratified by a certain number of states, and those must represent a certain tonnage percentage of the world’s merchant shipping. The entry into force requirement for the MARPOL Convention, optional annexes or Protocols are that at least 15 states have to ratify them, and those must constitute at least fifty per cent of the gross tonnage of the world’s merchant shipping. These requirements are stringent, but necessary to ensure a wide international application. If the rules were not widely applied, one would risk Owners changing their flag (“Flag of convenience”) and chartering their ships to ports where the rules do not apply (“port of convenience”). In addition, as will be explained further below, the amendment procedure enables IMO to adopt additional requirements under the same instrument at a rapid pace. It is therefore crucial to bring along as many parties as possible from the outset or else one would risk parties being even more reluctant to join the instrument at a later time. Then again, this would only be a risk if the ratification from the outset was very low. A wide number of states ratifying the convention, and enforcement from both the flag and port states, “forces” states with an international merchant fleet to join the instruments.

3.2.2 Amendment Procedures - Tacit and Explicit Acceptance

Once a convention or a protocol is adopted and entered into force, further rules and restrictions under the existing instrument is relatively easy to adopt. This is due to the tacit acceptance procedure. The procedure is incorporated into most of IMO’s legal instruments and enables IMO to bring amendments into force within a reasonable period of time. The opposite to this procedure is the explicit acceptance procedure, where it can take many years before amendments enters into force making the instruments rigid and hard to keep up to date with technical and economic developments.

In MARPOL, the tacit acceptance procedure is incorporated in Article 16(f)(iii). After the adoption of a subsequent amendment to the Convention or any of the annexes, it is circulated to all parties for acceptance. The amendments are deemed to have been accepted by all parties at the end of a time period determined by MEPC, with no need for any new formal acceptance, unless one-third of the parties, or by parties which combined merchant fleet constitutes not less than fifty percent of the gross tonnage of the world’s merchant fleet, objects to the amendments

\[52\text{ MARPOL Art. 15(1) and (2), and Art. V(Protocol) (1)}\]
\[53\text{ MARPOL Art. 16(2)(c)}\]
before the acceptance date arrives. The amendments will then enter into force six months later.

The tacit acceptance procedure in Art. 16(f)(iii) is the main rule. However, if MEPC (or another appropriate body) decides, they can use the explicit acceptance procedure set out in Art. 16(f)(ii). In order for the amendments to be deemed accepted, it needs two-thirds of the parties representing not less than fifty per cent of the gross tonnage of the world’s merchant fleet, to explicitly accept them. They will be deemed accepted on the date when the last needed party delivers their acceptance and enter into force six months after that date. The problem with the latter procedure is that it creates uncertainty as to when the amendments will enter into force making it hard for parties to prepare.

After the Protocol of 1997 (Annex VI) entered into force in 2005, the annex was amended and strengthened significantly at the MEPC Resolution 176(58) in October 2008, setting out further sulphur restrictions and other requirements moving forward. This is the so called “Revised Annex VI”. Despite the significant changes this made to parties’ obligations, the resolution entered into force already on 1 January 2010 due to the tacit acceptance procedure.

For a resolution to be barred from entering into force, objections by as many states as required in Art 16(f)(iii) is needed, which is very unusual. Therefore, participation in the process prior to adoption of amendments is crucial to those state opposing the amendments. All parties to the convention are entitled to participate in the proceedings of MEPC. To be heard, they must raise their concerns during the proceedings. However, even if some parties object to the adoption of a resolution, it is only needed a two-thirds majority of the Parties present and voting to accept the adoption. This entails in principle that a party can be objecting to amendments both at the stage of adoption and at the stage of acceptance, but still be bound by the rules when they enter into force.

When the tacit acceptance procedure was first considered by the Legal Committee there were some concerns regarding its legality. The Vienna Convention on the Law of Treaties Article 40(4) provides that an amending agreement “does not bind any State already a party to the treaty
which does not become a party to the amending agreement.\textsuperscript{61} Other provisions of the Vienna Convention support the view that states do not incur a legal obligation automatically without any active acceptance of that obligation.\textsuperscript{62} However, the main counter argument to this is the fact that MARPOL contains the amendment procedural rules and parties agree to those rules when ratifying the convention. The treaties specifying such amendment procedures should take precedence over the ambiguous Article 40(4). The practice is also supported by the UN which allows treaty amendments to become binding after a two-third acceptance rate.\textsuperscript{63}

3.2.3 Challenges with the Tacit Acceptance Procedure

There are clear benefits to the tacit acceptance procedure. It makes law-making effective and enables IMO to produce regulations that states normally might be reluctant to agree to, especially environmental regulations. Moreover, whenever weaknesses are discovered within regulations already in place, it is easier to correct or improve those weaknesses quickly. The method enables instruments to keep up to date with developments in parallel fields such as economy, research and technology.

Despite the benefits there are some challenges. The frequency of amendments and the short amount of time to prepare before they enter into force can be challenging for some party states, especially developing countries. In order to implement the changes needed, costly measures might be necessary. Moreover, sometimes domestic legislation must be resolved for the regulation to be properly implemented. A party may notify the Secretary-General that their express approval is necessary before it enters into force for that party.\textsuperscript{64} Still, a decision at national level must be made if the party is to give such notification. It can often take a long time to examine all effects of new regulations, such as cost-benefit analyses. Moreover, the ships registered under their flag would still have to comply to the regulations even though their governments are unable to implement them properly. In practice, the IMO law-making procedure results in regulations that are final and binding upon all ships sailing internationally even if such notification by the flag state is made.

The rapid development of requirements also poses huge challenges to the shipping industry. Even if the flag state delay the entering into force of an amendment, it makes little difference to the private actors subject to the substantive law. Owners and operators have to continuously adapt. They have to stay updated of new requirements expected to enter into force and prepare for those by taking the measures needed to comply. This can possibly entail installing new

\textsuperscript{61} Vienna Convention Art. 40(4)  
\textsuperscript{62} Lei (1999) p. 308  
\textsuperscript{63} Lei (1999) p. 309  
\textsuperscript{64} MARPOL Art. 16(f)(ii)
equipment or technology, which is very costly. Sometimes, there are optional methods to comply, where the owners have to analyse what method is most beneficial. As to the sulphur requirement under Annex VI, the owners has to decide whether to install exhaust gas cleaning systems or burning compliant fuel. These strategic decisions can be challenging considering it is difficult to predict what new prohibitions or requirements might be imposed next. For example, in order to comply with the 0.5% sulphur cap from 1 January 2020, some ships have already ordered or installed open loop scrubbers. As research about the effects of discharge water on the marine environments are advancing, progression might increase the likelihood of open loop scrubbers meeting restrictions in the future.

The legal adjustments of long-term contracts between owners and charterers can potentially be challenging. New international requirements often mean additional expenses. Who shall bear those expenses? How should potential technical adjustments be executed? Owners and charterers must make sure that their contractual relationship is clear on the allocation responsibilities. If a contract needs amending or adding, the process of negotiating allocations of cost and obligations can be demanding and time-consuming.

3.2.4 Conclusion
IMO’s authority in the maritime industry is in some sense resembling the authority domestic government has over their sovereign territory. Their law-making process and the fact that states enforce their legislation as both flag and port states makes them a powerful organization. Even though IMO’s environmental law making causes a rocky road, it might be the only road towards a greener industry. If one where to apply the explicit acceptance procedure every time one was to make a progression, it would probably take too long. Regardless the challenges, as explained under Chapter 2, lowering sulphur emission is estimated to be of huge benefit to the environment and human health, and will be worth it in the long run.

4 MARPOL Annex VI – Implementation and Enforcement of the Sulphur Requirement

4.1 Introduction

The provisions in MARPOL Annex VI sets out the substantive law, containing concrete and specific requirements on preventing air emissions from ships. They address survey, certification and means of control (Chapter 2), requirements for control of emissions from ships (Chapter 3) and regulations on energy efficiency for ships (Chapter 4). Chapter 3 contains the emission requirements which addresses ozone-depleting substances, Nitrogen oxides (NOx), Sulphur ox-
ides (SOx) and particular matter, volatile organic compounds and restrictions on shipboard incineration. In addition, chapter 3 address the port state obligation to have necessary reception facilities, and to address fuel oil availability and compliant quality from fuel suppliers.

The provisions each represents challenges for the industry and enforcing governments. The sulphur requirement is probably the one causing the biggest implications, considering the costs and uncertainties for the industry and the challenges of enforcing them. The following examination will cover how the sulphur requirement shall be implemented by the shipping operators and what the practical implications they are facing. Further, the discussion will look into how governments control compliance under MARPOLs enforcement regime, and the coastal/port state jurisdictional limitations.

4.2 The technical requirements of Regulation 14 of Annex VI and the Implications for Owners and Charterers

4.2.1 The Sulphur in Fuel Limitation

Regulation 14 contains the sulphur requirement. The provision applies to all ships.65 A “ship” under MARPOL covers all types of vessels and includes submersibles, floating craft and fixed or floating platforms.66 The fuel requirements covers all fuels intended for combustion on board a ship.67 The only exceptions are emissions necessary to secure the safety of a ship or saving life at sea, emission resulting from damage to a ship or its equipment, trials and research or emissions from sea-bed mineral activities such as set out in Regulation 3 of Annex VI. The regulations neither apply to warships and ships used only on government non-commercial service.68 In other words, all commercial ships are affected.

Regulation 14 divide between “general requirements”, and the requirement within “emission control areas” (ECAs). The “general requirements” apply everywhere at sea except within ECAs. The ECAs designated under regulation 14 are also referred to as “sulphur emission control areas” (SECA). While ships are operating within a SECA, the sulphur content of fuel oil used on board ships shall not exceed 0.1% m/m.69 The general requirement, outside SECAs, are that sulphur contents cannot exceed 3.5% m/m, and from 1 January 2020; 0.5% m/m.70

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65 Annex VI Reg. 1
66 MARPOL Art. 4
67 Annex VI Reg. 2(9)
68 MARPOL Art. 3(3)
69 Annex VI Reg. 14(4)(3)
70 Annex VI Reg. 14(1) (2) and (3)
The distinction between a global limit and limits within ECAs also applies under regulation 13 providing the limitations in NOx emissions. ECAs are established along certain coastlines due to the adverse effects NOx and SOx has to populations close to the emission source. Different to NOx emissions which can be reduced by engine technology, SOx emissions is purely dependent on the quality and sulphur content of the fuel, unless the ship is equipped with alternative technology. If no alternative technology is installed, lowering the emission of sulphur require ships to burn fuel oil with lower content of sulphur (LSFO). Compliance of the sulphur requirement is therefore of both a static and a non-static feature. The ship has to be in a condition able to burn LSFO, and the fuel content has to be compliant at all times. Ships must also be in a condition capable of holding two different types of fuel segregated, if they are operating within and outside SECAs.

4.2.2 Switching Fuel Oil in and out of SECAs

Today, there are four SECAs designated under MARPOL; the Baltic Sea, the North Sea, the United States Caribbean Sea and the North American area. The latter consists of the US and Canadian coast. These areas are enclosed by geodesic lines that all ship operators have to be aware of.\(^{71}\) Furthermore, there are several other emission control areas designated under domestic legislation with their own sulphur limitation. Whenever entering a SECA designated under Annex VI, the ship has to use fuel containing sulphur not exceeding the 0.1% limit. All modern ships have a LSFO calculator installed that indicates the time the changeovers should commence.\(^{72}\)

Most vessels are burning high sulphur oil (HSFO), not exceeding the 3.5% limit. For those ships operating both inside and outside the SECA, they must switch to low sulphur fuel oil (LSFO), not exceeding 0.1%, prior to entering an area. In practice, this means that ships must at least have two bunker tanks in order to keep the different fuel oils segregated. The crew must conduct a full changeover procedure before entry.

To ships entering or leaving a SECA, the timing of the switch of fuel oils is crucial. The difference in cost of burning HSFO and LSFO is huge. A switch too early when entering a SECA can result in unnecessary fuel expenses, and significant costs over time. Switching too late, one risks being in breach of Annex VI. The same considerations apply out of SECAs. Considering the large amounts to be saved by cheating, the risk is that ships might switch too late when entering, and too early when exiting an ECA. In order to avoid ships from cheating, regulation 14(6) requires ships to carry a written procedure showing how the changeover is to be done.

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\(^{71}\) IMO (2019e) and Appendix III of Annex VI

\(^{72}\) Marine Insight (2016)
The log-book must show the volume of LSFO in each tank and the date, time and position of the ship when the fuel change-over is completed. Whether this method is efficient to promote compliance will be discussed below under 4.3.

4.2.3 Complying to the 2020 Sulphur Limit – Owners’ Options

The change from 3.5% to 0.5% sulphur content fuel oil 1 January 2020 poses several challenges to Owners and Charterers, both practical and contractual. The ultimate objective of annex VI is to lower emissions from ships. However, there are other ways to achieve this than to use LSFO. Regulation 4 of Annex VI provides that flag states may allow for alternative measures with the equivalent effect as using LSFO not exceeding the limits. This leaves ship operators with mainly two options. They can use compliant LSFO, or install exhaust gas cleaning systems, so called “scrubbers”. By installing scrubbers the ship can then burn cheap HSFO and save the costs of installing such technology after time, depending on the price difference between HSFO and LSFO.

Another possibility is to use LNG or equivalent as fuel. The problem with LNG is that the vessel’s infrastructure has to be modified to install the much bigger tanks needed to keep the pressurized gas from evaporating. A reconstruction of the engine is also necessary. Option for LNG might only be a realistic solution worth considering when ordering new ships.

4.2.3.1 Using Compliant Low Sulphur Fuel Oil

When considering whether to switch to compliant LSFO when enforcement date comes or install scrubbers, owners must take into account several uncertainties. One is the price difference between LSFO and HSFO, which is hard to estimate what will be. The price depends upon the price of crude oil and the future demand for the different types of fuel. This demand will obviously change after 1 January 2020, but it is uncertain by how much, and what effect this will have on the price. It is anticipated that the price of LSFO will spike significantly as demand will increase, especially in the beginning, before fuel supplier have adapted. This leads to another concern, if there will be sufficient availability of LSFO to supply the demand.

Regulation 18 of Annex VI recognises the concern regarding availability. It requires party states to “take all reasonable steps to promote the availability of fuel oils”. Still, the availability relies on the market, i.e. the relationship between supply and demand. States are also required

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73 Annex VI Reg. 14(6)
74 Ship & Bunker (2018a)
75 Annex VI Reg. 18(1)
to “inform the Organization of compliant fuel oils in its ports”. This is only information regarding availability at the present time, and not information about future availability which will be heavily affected by the change in the market. The Liberian flag state has urged IMO to require littoral states to report early of their LSFO availability. Early reporting could potentially help Owners in choosing compliance method as early as possible.

Where ships are unable to obtain compliant fuel and are forced to use non-compliant fuel, regulation 18 provides for an exemption. However, the ship must then provide evidence that it has “attempted to purchase compliant fuel oil in accordance with its voyage plan and that attempts were made to locate alternative sources.” Moreover, that despite their best effort no such fuel was made available. They have to present a record of the action taken to achieve compliance. How much effort the ship operators must make to locate compliant fuel, what kind of evidence is needed and how clear that evidence must be, is uncertain. Regardless, the ship “should not be required to deviate from its intended voyage or to delay unduly the voyage in order to achieve compliance.” This implies that as long as there was no reason to believe there were any risk of not obtaining compliant fuel at next bunkering port at the time the trip started, the ship is at least not forced to deviate from their voyage nor be unduly delayed, which they normally would not be allowed to under a charter party (see chapter 5).

How these requirements are to be interpreted will in practice be up to the enforcing state. It is likely that the evidential requirements will be strict, considering the gains to be made by not complying. A stringent interpretation is necessary to prevent misuse of the exemption. On the other hand, a more lenient practice in the starting phase could would make sense if availability turns out to be a big problem.

There were proposals ahead of MEPC 73 of whether one might have an experience-building phase with a pragmatic enforcement approach because of the uncertainties regarding new blends and availability. The period would last until the marked had adjusted to the new requirements. However, this was turned down at MEPC 73 due to a concern that such period would send the wrong signal and cause uncertainty about implementation of the 2020 sulphur

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76 Annex VI Reg. 18(1)
77 Dodds, Marcus (2018)
78 Annex VI Reg. 18(2.1)(2)
79 Annex VI Reg. 18(2.1)(1)
80 Annex VI Reg. 18(2.2)
81 MEPC 73/5/14
82 MEPC 73/5/14 p. 3 (9)
limit. Also, the argument were made that Regulations 18 already provides for no deviation of voyage nor undue delay. The committee thus invited further concrete suggestions to enhance the implementation of Regulation 18 at the next MEPC meeting in May 2019.

4.2.3.2 Installing Scrubbers

To avoid issues regarding availability or quality of new fuel blends, choosing to install scrubbers can be a good option. Ships installing scrubbers will still be able to burn cheaper residual fuel oil. There will be other costs such as extra energy consumption, maintenance and potentially repair. Analysing whether installing scrubbers are profitable will be a bet on the price difference between HSFO and LSFO.

Before decides to invest in scrubbers there are additional considerations to be made. Scrubbers used on board ships are devices that uses water to remove particulates and gases from the exhaust streams. There are three main options; open-loop scrubbers, closed-loop scrubbers and hybrid types. The nature of an open and closed loop are significantly different and once one of them is installed it is not easily converted to the other. Hybrid scrubbers, could be a good option for ships who transit through all types of water, but they are more complex and expensive than open and closed loop. Thorough consideration is therefore needed before choosing which option to go for.

Open-loop scrubbers uses the surrounding seawater to clean the exhaust gases and then discharges it back into the sea. The water containing the sludge from the exhaust will be in the form of a warm acidic jet, but the immediate effects are mitigated due to rapid pH recovery when discharged out into the higher pH level seawater. This means that if the pH levels in the seawater has not sufficiently high pH levels, the cleaning will not be as effective. MEPC guidelines requires pH levels in the seawater to be measured before discharge, to make sure the levels are high enough. The more alkaline the water in the ambient, the lower pH of the discharge water is allowed. These are guidelines, but in accordance with Annex VI they “should” be followed. PH levels might not be high enough near land where the seawater is mixed with

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83 MEPC 73/19 p. 19 (12)
84 MEPC 73/19 p. 19 (3)
85 MEPC 73/19 p. 20 (5.33)
86 Ülpre (2014) p. 292
87 Ülpre (2014) p. 292
88 Resolution MEPC 259(68) 10.1.2
89 Resolution MEPC 259(68) 10.1.2
90 Annex VI Reg. 4(3)
freshwater, which in inconvenient since the ecosystems are fragile. The pH levels are also de-
pendent upon other factors, such as temperatures. These implications leads to some concerns
regarding open-loop scrubbers along shores.

Some countries, such as China, Singapore, Ireland and the United Arab Emirates has already
banned or warned that they will ban open loop scrubbers in their coastal waters or in waters
around certain ports, and the list of countries might expand.

As discussed above under 2.2.2, there are uncertainties regarding the long-term environmental
effects of oceanic acidification as well. One can wonder if there might come along international
regulations restricting the use of open-loop scrubbers in the near future.

Unlike open-loop, closed loop scrubbers does not use the ambient seawater, but freshwater
treated with chemicals to clean the exhaust gas. It is prohibited to discharge this water in the
sea, thus the ship needs large tanks to store both freshwater and discharge water. It is not al-
lowed to incinerate the residues form Scrubbers.91 The residues must be discharged off at port
facilities for handling. The ship must rely on port states to have the reception facilities necessary
to accept the cleaning residues, which might not always be the case. Another issue is the price.
Closed loop scrubbers are significantly more expensive than closed loop.

4.2.4 Conclusion
Complying with the sulphur limits, especially after 1 January 2020 is not easy. The decision of
whether to burn LSFO, or to install scrubbers, is not easy to make when there are so many
uncertainties in the cost-benefit analysis. Based on current orders, data show that 2693 ships
will be ready with scrubbers installed at the end of 2019.92 This low number might be due to
those uncertainties, where ship owners are waiting to see how markets develop. Nevertheless,
either of the options owners choose, complying with regulation 14 will be very expensive. A
question one might ask is whether some are hoping to avoid the regulations to some degree?
Controlling whether ships comply with the 0.5% sulphur limit at the high sea is difficult. There
are potentially big profits in breaking the law, so the next question is how easy is it to break the
law, and how are the regulations enforced? Is there any loopholes?

4.3 Enforcement of Annex VI

91 Annex VI Reg. 16(2)(6)
92 Saul (2019)
4.3.1 General

The main body of MARPOL and Annex VI contains the measures the governments of parties shall take into use, in order to control ships and establish whether a violation of the sulphur requirement has occurred. These will be examined under 4.3.2 and 4.3.3. In context of this, one should ask if they are sufficient to control compliance of the sulphur requirement. To answer this, firstly it is necessary to understand how the general enforcement regime works as a whole, and what incentives there are for ship operators to be in compliance of international requirements.

MARPOL applies to vessels flagged under states party to the convention. 93 It is the member states that are subject to the convention and it is ultimately their responsibility to make sure that vessels registered in their national ship registry comply with the substantive law. Violations shall be prohibited and sanctions established under the law of the states party to the convention. 94 However, prohibition and sanctions shall also apply to any ships entering the jurisdiction of any of the parties. 95 Moreover, if there is sufficient evidence of an alleged violation, the party shall cause proceedings to be taken in accordance with the law of that state. 96 When a state discovers a violation by a foreign ship, they can choose to furnish the evidence of the violation to the flag state authorities for proceedings to be taken by the flag state. 97 Either way, the parties has the responsibility to control compliance of Annex VI both as costal states and flag states in order to “give effect” to the regulations. 98 They must “co-operate in the detection of violations and the enforcement”, and use “all appropriate and practicable measures of detection and environmental monitoring, adequate procedures for reporting and accumulation of evidence”. 99

Enforcement conducted by both flag and port states inhibit ships from changing their flag to so called “Flag of Convenience” in order to avoid the requirements. There is no escaping the rules of MARPOL, as long as states implement and enforce them properly. Moreover, most charter parties contain clauses requiring the ship to be able to sail within a certain trading area, i.e. to be in compliance with whatever international regulations that may be in force at the time within that area. If one of the parties breaches the sulphur regulation, the potential punitive measure in itself might not be the biggest concern, but rather the contractual consequences of those

93 MARPOL Art. 3
94 MARPOL Art. 4(1)
95 MARPOL Art. 4(2)
96 MARPOL Art. 4(1)
97 MARPOL Art. 4(2) (a) and (b)
98 MARPOL Art. 1
99 MARPOL Art. 6(1)
measures. If a ship is denied access to a port or being detained, it means a delay or disruption of trade, which can cost way more to the owner or charterer than a fine.

In addition to the international requirements of IMO, some states can potentially have more stringent requirements. Ship operators must be aware of these whenever entering different jurisdictions. For example, ships at berth in EU ports are required by EU law to use fuel with a maximum sulphur content of 0.1%. Moreover, the quality of port state control can differ which creates uncertainties. Port states are striving to align their control routines by agreeing to international Memorandum of Understandings on port state control (MoU). Today there are 9 signed MoUs on port state control world-wide. Even though the port state control within these MoUs are somewhat similar, if a breach is discovered, the consequences and sanctions to be given is decided by the domestic law of that country. Uncertainties regarding consequences of breach might be inconvenient, but can also work as incentives to making sure ships are in compliance with the minimum requirements of IMO to avoid unpleasant surprises.

All these elements combined add up to a system well designed to implement and enforce international requirements effectively. However, there are some particular challenges with the sulphur requirement under Annex VI. Because it is purely dependent upon the fuel quality (unless the ship is equipped with abatement technologies) it is hard to control what fuel the ship is actually burning when it is at sea.

Today, there is not as much gains to be made by exceeding the 3.5% global limit as the gains to be made by exceeding a 0.5% limit. The focus on the enforcement mechanisms have increased after the decision by MEPC, that the 0.5% global limit will already be in force from 1 January 2020. Since 2015, the challenge has been enforcement of the sulphur limit of 0.1% within ECAs. Controlling compliance with a global limit is different and more demanding. How can one control compliance at the high seas when it is only the flag state that has enforcement jurisdiction?

There are frequently new suggestions submitted to MEPC on how to improve enforcement. MEPC 73 adopted amendments to regulation 14 prohibiting carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship. The carriage ban will enter into force 1 March 2020. The time gap between 1 January and the date the carriage ban

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100 Dir 2016/802/EU Art. 7
101 IMO (2019f)
102 Resolution MEPC 280(70) Section 1
103 Resolution MEPC 305(73)
104 Resolution MEPC 305(73) Section 3
enters into force gives shipowners, or charterers, some time to dispose of non-compliant fuel oil. To impose such ban will likely increase the compliance rate. Switching between fuel oils is relatively easy and the ban prohibits a switch once the ship is out of port. It inhibits ship operators from simply claiming the non-compliant fuel on board has not been used, and therefore not being in breach. On the other hand, the carriage ban will not apply to those ships transporting fuel oils for non-combustion purposes, or those ships with an exhaust gas cleaning system. Moreover, the fuel “carried” by the ship will still have to be checked by flag or port states the same way the fuel in the bunker tanks needs to be checked. One cannot rely fully on this measure to ensure compliance.

4.3.2 Control by Flag States

4.3.2.1 Surveys and Issuance of IAPP Certificate

Annex VI requires the flag state authorities to conduct surveys of their ships and to issue an International Air Pollution Prevention Certificate (IAPP Certificate). The obligation applies to ships of 400 gross tonnage and above. For ships of less than 400 gross tonnage the parties choose what measures to establish to ensure these also complies with the regulations. The surveys may also be done by nominated surveyors or organizations recognized by the flag state. Such organizations must comply with the guidelines adopted by IMO. Normally governments delegate the power to conduct inspection of their own ships to Classification Societies.

Section 2.3 of the IAPP Certificate shall ensure that the ship uses fuel oil with a sulphur content that does not exceed the applicable limit value as documented by bunker delivery notes or uses an approved equivalent arrangement. After 1 March 2020, the IAPP Certificate must also contain a section confirming the sulphur content of fuel carried, for use, on board the ship does not exceed 0.5%. In order for a ship to obtain this certificate, the surveys must have ensured that the “equipment, systems, fittings, arrangements and material fully comply with the applicable requirements” of Annex VI. If there is no scrubber technology installed, compliance is

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105 Annex VI Reg. 5(1) and 6
106 Annex VI Reg. 6(1)(1)
107 Annex VI Reg. 6(2)
108 Annex VI Reg. 5(3)
109 Annex VI Reg. 5(3)(1)
110 Resolution MEPC 194(61) p.3
111 Resolution MEPC 305(73) p.3 (2.3.3)
112 Annex VI Reg. 5(1)
purely dependent upon the sulphur content of the fuel oil. Hence, the surveys only reaches as far as ensuring the ships are able to burn compliant fuel oil, and that the master and crew are competent to execute the relevant shipboard procedures. The surveyor will, naturally, only be able to check sulphur levels at the time a survey is conducted. The IAPP Certificate is valid for a period of no more than five years, and annual surveys must be done to verify compliance. For the time in between the surveys there is no requirement to further control that the ship is burning compliant fuel oils by flag states/classification societies.

This means that the control required by flag states under MARPOL Annex VI is far from sufficient to ensure compliance with the sulphur requirement. Air emissions must be detected where the ships are operating. This means that enforcement of the sulphur requires are dependent upon costal states’ control.

4.3.2.2 Class rules – Likely to be more Capable of Controlling Sulphur Emissions?

Even though MARPOL only requires flag states to conduct surveys and issue the IAPP certificate, flag states can potentially do more in making sure their ships comply. This could entail installing sulphur monitoring devices etc.

Classification Societies execute the surveys of ships and issue certificates on behalf of flag states, in accordance with their own “class rules”. Even though a flag state delegate the surveying of ships to a classification society, they are responsible that they do a sufficient job. The flag state “shall fully guarantee the completeness and efficiency of the survey”.

Flag states are competing amongst each other. When ship owners decide under which flag to register their ships, one criteria considered is what performance record the flag state has in the form of deficiencies and detentions registered in ports. For example, the Paris MoU publishes a white, grey and black list annually based on flag state performance, taking into account the total number of inspections and detentions over a 3-year rolling period. The ships registered under flags on the grey and black list will be considered of higher risk for deficiencies than the ships on the white list, and will more frequently be inspected at ports. Being subject to inspections is unwanted and ships would rather be registered under a flag on the white list where they will not have to be inspected as frequently. This means that flag states will be selecting the classification societies that has the best record when it comes to making sure ships are compliant.

113 Annex VI Reg. 9(1)
114 Annex VI Reg 5(3)(4)
115 Paris MoU
The class rules are standards that should always be up to date with the international standards, and hence, contain the requirements stipulated in Annex VI. When a classification society issues certificates, their name will be on the certificate and their reputation is at stake when deficiencies are detected. It is bad for business if one of “their” ships are is in breach of regulations, the same way it is bad for flag states. However, whether this is incentive enough for the classification societies to go further than what is strictly required by international standards is hard to answer. It will probably depend on many factors, such as how many violations will be detected after 1 January 2020 and the extra costs and time needed to control ships emissions.

4.3.3 Port state control

4.3.3.1 Inspection of Ships

Port state control exist to support and back up flag state oversight. Regulation 10 and 11 of Annex VI contain provisions for governments to inspect foreign ships subject to Annex VI that visit their ports. Procedures of port state control set out in Article 5 of MARPOL also applies to Regulation 10. In addition, as mentioned under 3.1.3, the Parties shall ensure that “no more favourable treatment is given” to non-Parties to the convention. This means that all ships entering ports of Annex VI states must be compliant to the regulations and ready for inspection.

In the rest of this section there will be conducted an examining of the port state enforcement mechanisms in place under Annex VI, and to what extent they function to control compliance of the sulphur requirement. The general jurisdictional limitations and opportunities is set out in UNCLOS and will be examined under 4.4.

Port state control is primarily done by an initial standard inspection of the ship by appointed or authorized officers by the party. The inspection, “shall be limited to verifying that the ship has on board a valid certificate”. Any certificate of a party to Annex VI must be accepted as long as it is compliant to the requirements of the convention. The IAPP certificate must confirm that the ship is using compliant fuel oil, or has abatement technology installed. A further more detailed inspection of whether the ship is compliant to operational requirements can only be conducted if there are “clear grounds” to believe otherwise.

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116 Annex VI Reg. 10 and 11
117 Annex VI Reg. 10(3)
118 MARPOL Art. 5(4)
119 Annex VI 10(1) and 11(2)
120 MARPOL Art. 5(2)
121 MARPOL Art. 5(1)
122 Annex VI Reg. 10(1) and Resolution MEPC 181(59) 2.1.6 and 2.1.7
As mentioned under 4.3.2, a mere reading of the IAPP certificate issued by the flag state will not be sufficient insurance that the ship has not exceeded the sulphur limitation after the survey was conducted. Therefore, regulation 11 of Annex VI provides that the inspector may verify whether the ship has “emitted any of the substances covered by this Annex in violation of the provision of this Annex”. Regulation 11 says nothing about how this verification should be done. However, it is set out in MEPC Guidelines on port state control that as part of the initial inspection one also checks the Bunker delivery Note and the belonging sample, any written procedures for fuel change-over (for ships operating both inside and outside SECAs), log books and approved documentation relating to scrubbers.\textsuperscript{123} That these documents will be subject to an initial inspection can also be implicitly understood by reading the provisions in Annex VI relating to the sulphur requirement.\textsuperscript{124}

If any of the documents are not compliant or missing, it will fulfill the “clear grounds” requirement in Regulation 10, and the port state control officer can conduct a more detailed inspection in order to verify that the fuel on board is compliant.\textsuperscript{125} This will most likely be done by taking samples of the fuel on board the ship, alternatively examining whether the scrubber systems are working properly. However, in accordance with the Guidelines on port state control, the documentation first have to indicate a breach either by one of them missing or being “clearly invalid”.\textsuperscript{126} Other evidence can also fulfill the “clear grounds” requirement, such as reports or information that the ship appears to be substandard. Such information can potentially come from one of the crew members, coast guards or other similar sources.

\begin{flushleft}\textbf{4.3.3.2 The Bunker Delivery Note and Accompanied Representative Sample}\end{flushleft}

The Bunker Delivery Note (BDN) is an important tool in controlling compliance of the sulphur requirement. The ships subject to inspections (400 gross tonnage and above), must make sure to have the BDN from the fuel supplier confirming the fuel bunkered is compliant.\textsuperscript{127} It must contain the name of the fuel supplier and a confirmation from the supplier that the fuel is compliant to the quality requirements of Annex VI.\textsuperscript{128} The BDN must be retained for three years after the fuel was delivered on board.\textsuperscript{129}

\textsuperscript{123} Resolution MEPC 181(59) 2.1.1 (6), (7) and (8)
\textsuperscript{124} Annex VI Reg. 14 and 18
\textsuperscript{125} Resolution MEPC 181(59) 2.1.6 and 2.1.7
\textsuperscript{126} Resolution MEPC 181(59) 2.1.7 (1) and (2)
\textsuperscript{127} Annex VI Reg. 18.5.
\textsuperscript{128} Annex VI Appendix V
\textsuperscript{129} Annex VI Reg. 18.6
No supplier would want their fuel to be non-compliant. If fuel is discovered not to be compatible with the bunker delivery note, the port state must inform the state where the BDN was issued.\textsuperscript{130} A party to annex VI receiving this information is obliged to take “remedial action as appropriate”\textsuperscript{131} too make sure to “bring non-compliant fuel into compliance”\textsuperscript{132}. Moreover, information about cases of non-compliant fuel will be shared with the organization and other members. Ships might be reluctant to buy fuel from a supplier that has previously delivered non-compliant fuel. From a supplier’s perspective the BDN works as an efficient incentive to provide fuel compliant to Annex VI.

Thus, the cause of fuel exceeding the sulphur limit could also be due to the handling of fuel on board the ship by the crew. There might be residues of old non-compliant fuel if the tanks are not properly cleaned before bunkering or mixing of higher sulphur fuel oil with low sulphur fuel oil. Together with the BDN, a representative sealed sample of the bunkered fuel, signed by the supplier, is also required. An accompanied sample will help the port state to identify who is to blame for a possible breach. The sample has to be kept until the fuel is consumed, or at least 12 months from the time the fuel was delivered.\textsuperscript{133}

A ship can be in breach of the sulphur requirement even though the BDN and the accompanied sample shows compliance. There can be fuel on-board other than the fuel delivered by the supplier stipulated in the BDN or there can be mixing of fuel which cause the sulphur content to exceed the limits. If ship operators wilfully would want to violate the sulphur requirement, which is a concern after 1 January, a fuel changeover could be done at sea, then a change back before entering the next port without problems. Of course, the risk is that numbers in record books will not add up, which can raise suspicion and cause a more detailed inspection. However, the possibility is there and is worth noticing.

\section*{4.3.3.3 Log-books and Written Procedures of Fuel Changeover}

Ships using separate fuel oils when operating both within and outside SECAs, must provide that they did switch to compliant fuel before entering or after exiting. The log-book must show the volume of low sulphur fuel oils in each tank, the time, date and position of the ship when the changeover was done prior to entry.\textsuperscript{134} If there are no such procedures in place or the log-books do not add up, it will be “clear grounds” to further investigate whether the ship complies with operational requirements.

\begin{footnotes}
\item[130] Annex VI reg. 18.10.1
\item[131] Annex VI Reg. 18.10.2
\item[132] Annex VI Reg. 18.10.2
\item[133] Annex VI Reg. 18
\item[134] Annex Vi Reg. 14(6)
\end{footnotes}
The United States has on several occasions used the log-book as a “tool” to sanction ships in breach of Regulation 14. If the log-books are tampered with, e.g. to cover up a change to low sulphur fuel oil too late after entering their SECA, it can potentially amount to a breach of the False Claim Act under US law. In some cases these proceedings has resulted in arrest of crew and owners. They are not arrested because of the breach of regulation 14 itself, but the fact that they have provided false information to authorities by tampering with the log-books in order to cover it up.

4.3.3.4 Remedies

MARPOL says little about what consequences should be imposed if a breach of the sulphur requirement is discovered. It will be up to the port state to choose how to pursue with remedial actions. However, MARPOL do put out some pointers on what a ship might expect if they are in breach.

MEPC Guidelines on port state control states that in deciding whether to detain a ship until deficiencies are corrected, the port state should use “professional judgement”\(^\text{135}\). Article 5 of MARPOL requires port states to ensure that ships do not sail if the deficiencies poses an “unreasonable threat of harm to the marine environment”\(^\text{136}\). Guidelines provides that a breach of the sulphur requirement will be of such a serious nature that it “may”\(^\text{137}\) warrant the port state to detain the ship.\(^\text{138}\) However, the wording of the guidelines are vague and works only as guidance. What is clear, is that detention is mean to be used as a preventive measure by the port states where ships are in breach of the sulphur requirement.

MARPOL Article 5(3) also mention the alternative of denying a ship entry to ports, but only address the requirement for the port state to inform the flag state authorities if such measure is imposed.

MARPOL Article 7 urges the port states to make “all possible efforts […] to avoid a ship being unduly detained or delayed”\(^\text{139}\), and further entitles ships that are unduly delayed or detained to be “compensated for any loss or damage suffered”\(^\text{140}\). This provision restrain port state from abuse of power and promotes efficiency which is crucial for the shipping industry.

\(^{135}\) Resolution MEPC 181(59) 2.3.1
\(^{136}\) MARPOL Art. 5(2)
\(^{137}\) Resolution MEPC 181(59) 2.3.2
\(^{138}\) Resolution MEPC 181(59) 2.3.2 .4 and .5
\(^{139}\) MARPOL Art. 7(1)
\(^{140}\) MARPOL Art. 7(2)
MARPOL Article 4(4) stipulates a requirement for parties to establish penalties which are adequate in severity to discourage violations, moreover, that they should be equally severe irrespective of where the violation occurs. In practice, what penalties to expect will depend upon domestic legislation, which differs. For the regulation to be effective it is important that the penalties are adequate. Monetary fines have to be high enough, so that it is not more profitable to burn HSFO with the risk of a “small” fine, than to burn compliant LSFO.

4.3.4 Conclusion
The control measures under MARPOL, i.e. BDN and log books, work well as incentives to prohibit violations. However, if ship operators with intent would want to violate the sulphur requirements, there are loopholes. Log books and other documents can potentially be tampered with and the BDN is not necessarily representative of all fuel that has been used during a voyage. If the port state control purely apply the control measures listed under MARPOL, some violations will probably go under the radar.

On the one hand, provisions under MARPOL and Annex VI seems to restrict port states’ jurisdiction by stipulating that evidence is needed before conducting more detailed inspections. On the other hand, regulation 11(1), as well as MARPOL Article 6(1), provides that parties “shall co-operate in the detection of violations and the enforcement of the provisions […] using all appropriate and practicable measures of detection and environmental monitoring, adequate procedures for reporting and accumulation of evidence”. Moreover, MARPOL Article 9(2) and Annex VI Regulation11 (6) clarifies that the convention is not intended to affect international law on jurisdictional matters. Enforcement jurisdiction will be stipulated by UNCLOS (see 4.4).

MARPOL primarily sets out the substantive law that needs to be implemented and the documentation that need to be provided under inspections. Moreover, prohibit port states from abusing their power so ships can still trade as freely as possible. Keeping the balance between efficient enforcement mechanisms and free trade is an important objective of IMO.141 It is clear that MARPOL balances the consideration that ships should be able to sail freely without being in risk of unnecessary remedies, and the consideration that enforcement of the air pollution requirements needs to be efficiently conducted.

4.4 Jurisdictional Limitations of the Costal / Port State

141 IMO Convention Art 1(b)
4.4.1 General

As concluded above, the enforcement measures required under MARPOL is not sufficient to prevent ships from breaking the rules under all circumstances. For the Owners and Charterers that are set on being in compliance, which is hopefully most of them, a more vigorous enforcement regime by flag and costal states are welcomed and wanted. States may, in addition those set out in MARPOL Annex VI, take further measures to control ships. Some has already tested so called “sulphur-sniffers” attached to aircrafts, drones or on fixed sites like bridges. The sulphur-sniffer can detect whether the exhaust form the ship has the correct sulphur content. Even further, there might be ships patrolling the coastal areas. If a state want to take further steps, what jurisdictional possibilities and limitations might there be for coastal states to take further action than required by the convention?

A flag state’s jurisdiction over its own ships are not limited by international law. A coastal and port state’s jurisdiction over foreign ships on the other hand, is limited by international law. If more stringent enforcement measures are to be used, the coastal/port state have to take into consideration the international jurisdictional framework. This applies both when conducting inspections and other means of control, and when imposing punitive measures on foreign ships.

First it must be mentioned that the prescriptive jurisdiction of a costal state to implement the MARPOL Annex VI rules, within their geographical jurisdictional limits, is not limited by international law. In fact, parties “shall” prohibit violations from foreign ships within their jurisdiction, and jurisdiction shall be construed in the light of international law. States’ geographical jurisdiction is set out in the United Nations Conference of the Law of the Sea ("UNCLOS") and means their territorial waters which includes the internal waters, territorial sea and exclusive economic zone.

Enforcement jurisdiction, as opposed to prescriptive, is limited by international law. Regulation 11(6) of Annex VI states that “the international law concerning the prevention, reduction, and control of pollution of the marine environment from ships, including that law relating to enforcement and safeguards [...] applies, mutatis mutandis, ” to Annex VI. As MARPOL and Annex VI provides how the jurisdiction are to be exercised in order to control compliance, UNCLOS defines flag, port and coastal state jurisdiction. Part XII of UNCLOS addresses the protection and preservation of the marine environment.

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142 Ringbom (2017) p. 9
143 MARPOL Art. 4(2)
144 MARPOL Art. 9(3)
145 Secretariat of IMO (2014) p.12
The question is what does this enforcement jurisdiction mean in relation to the emission requirement and what limitations does it put in a coastal/port state’s power to enforce them?

4.4.2 Coastal State Jurisdiction

For ships merely transiting territorial waters there are jurisdictional limitations on enforcement under UNCLOS. Provisions on enforcement by coastal states is provided for in Article 220. The article divides between ships within the EEZ and territorial sea. Enforcement jurisdiction over ships passing through internal waters is the same as if they were in port (see 4.4.3). Within the EEZ, Article 220(3) provides that if there are clear grounds for believing that a violation has taken place, the state may require the vessel to give certain information. This information could possibly establish whether a violation has occurred. Article 220(5) provides that the coastal state can undertake physical inspections, but only if it is already established that a violation has occurred and that it has resulted in a “substantial discharge causing or threatening significant pollution of the marine environment”. Air emission from a single ship is unlikely to meet those requirements.146

In the territorial sea on the other hand, Article 220(2) provides for the right of the coastal state to undertake physical inspection of a vessel. There has to be “clear grounds for believing” that the vessel has, “during its passage” in the territorial sea, “violated laws and regulations” such as those of Annex VI.147 The “clear ground” requirement could be fulfilled by the evidence gathered by a sulphur-sniffer.

However, this right is without prejudice to the relevant articles under Part II, section 3, of UNCLOS, i.e. the right of innocent passage.148 The coastal state cannot hamper a ships innocent passage through their territorial sea, unless it is provided for in UNCLOS.149 Because the rules on innocent passage supersedes article 220(2), the question is if a ship passing through the territorial sea in violation of Annex V regulation 14, can still be defined as “innocent”. Article 19(1) provides that “passage is innocent so long as it is not prejudicial to the peace, good order or security of the coastal State”. Article 19(2) lists the cases where a passage would not be considered “innocent”. A breach of environmental regulations would have to be an “act of wilful and serious pollution” in order not to be considered “innocent”.150 A breach of the sulphur requirement under Annex VI from one single ship would probably not fulfilling this requirement.

146 Ringbom (2017) p.11
147 UNCLOS Art. 220(2)
148 UNCLOS Art. 220(2)
149 UNCLOS Art. 24(1)
150 UNCLOS Art. 19(2)(h)
The conclusion is that enforcement of Annex VI over ships merely transiting the EEZ and/or the territorial sea is unlikely due to the legal constrains of UNCLOS.

4.4.3 Port State Jurisdiction

The extent of port state jurisdiction may differ depending upon several circumstances. As a main rule, whenever ships are voluntarily in a state’s port, by extension offshore terminals, or in their internal waters, subject themselves to the sovereign jurisdiction of that state. Ships will have to comply with their domestic legislation. This jurisdiction could be limited by international treaty commitments or general principles of international law such as non-discrimination and abusing their sovereign right. The measures taken generally has to be reasonable.

A violation of the sulphur requirement under Annex VI can be one of a static nature, or a non-static nature. A breach of a static nature refers to the condition of the ship, and whether it is capable of complying, e.g. if exhaust gas cleaning system is installed or if the ship has segregated bunker tanks for different fuel oil if they operate in and out of SECAs. In either of these instances, the ship would be in breach at the time it is in port. If such a breach were established it would be no jurisdictional limitations for a port state to impose enforcement measures.

A breach of a non-static nature of the sulphur requirement, which is more relevant in this context, refers to violations such as burning non-compliant fuel oil or not using the exhaust gas cleaning system properly, i.e. emitting too high amounts of sulphur. The breach could have occurred before entering port or even before entering territorial waters.

For violations occurring inside territorial waters, article 220(1) provides port states with full jurisdiction to institute proceedings. The interesting question is whether violations occurring outside territorial waters can be enforced by port states.

Article 218(1) provides for the port state’s right to enforce “applicable intentional rules and standards established through the competent international organization”, “in respect of any discharge”, even if the violation took place outside the territorial water (outside the EEZ). As established under 3.1.2, IMO is such competent organization. Decisive in establishing whether

\[151\] UNCLOS Art. 220(1)
\[152\] UNCLOS Art. 300
\[153\] Ringbom (2017) p. 13
\[154\] Ringbom (2017) p. 11-12
\[155\] Ringbom (2017) p. 12
Annex VI is “applicable international rules”, will depend upon to what degree Annex VI is accepted internationally. Considering that Annex VI is accepted by approximately 96.68% of the gross tonnage of the world's merchant fleet, there can be little doubt that the sulphur requirement must be considered applicable international rules. This means that port states can potentially enforce the sulphur requirement even though the violation has occurred outside their geographical jurisdiction.

An example of when this enforcement jurisdiction typically will be needed, is when ships enter a SECA and switches to compliant fuel oil too late, but before entering territorial waters. The geographical limit of a SECA can namely be further out at sea than an EEZ limit. Another example is when evidence of a violation at the high seas is furnished by whistle-blowers or other sources.

However, article 218 has been very sparingly used, and whether it will be applied to enforce the requirements under Annex VI remains to be seen.

4.4.4 Conclusion

If a coastal state discovers a ship in violation of the sulphur requirement under Annex VI, the port state will have full enforcement jurisdiction if the ship enter into port when the violation has occurred inside the territorial water, and possibly even outside, given that article 218 of UNCLOS is applicable. For ships merely transiting territorial sea and/or the EEZ, the right to innocent passage will supersede a right for coastal authorities to physically inspect ships, and will limit the coastal state’s opportunity to enforce Annex VI. Moreover, ships violating the sulphur requirement on their way out of the territorial waters will in practice be hard to “catch”.

Where jurisdiction or practicalities becomes limitations, cooperation between enforcing states becomes the solution. Furnishing obtained evidence, such as data from sulphur-sniffing drones, to the flag state, and alerting other port states, will be the alternative. However, whether such evidence is strong enough for states to impose penalties is another issue. Inspecting the ship will often be a prerequisite to verify that the violation took place and obtain evidence.

156 UNCLOS 218(1)
157 Secretariat of IMO (2014) p.11-12
158 IMO (2019d) p. 170
159 Ringbom (2017) p. 14
5 Legal Challenges in the Relationship between Owners and Charterers due to the Changeover Date 1 January 2020

5.1 General

When the changeover date arrives 1 January 2020, all ships must comply with the global sulphur limit in fuel oil of 0.5%. Owners are responsible that their ships are in compliance with MAR-POL Annex VI. However, in the chartering business the ships are normally hired by charterers for the purpose of shipping their goods from one place to another or hire the ship for a period of time. The contract between owners and charterers (the “charter party”) allocate their duties and responsibilities, e.g. who is to provide and pay for fuel etc. If ships are in breach of Annex VI, fines and enforcement remedies will be targeting the owners, but charterers will face indemnity claims if they are to blame for loss suffered.

The operational cost on each party is reflected by the hire rate or the freight rate. At the time when a long-term contract was entered into, the parties might not have accounted for some of the implications of the changeover. A contract that will extend over 1 January 2020 need to address various issues. Who is to bear the cost for the more expensive LSFO, and who bears the costs involved with preparing the ship for transitioning? The tanks must be cleaned, and old fuel disposed of. How and when this is to be done must be resolved. Moreover, who bears the risks of non-availability?

The parties are free to decide what the nature of their relationship shall be, but the practice is to use one of the various standard contracts produced by recognized legal organizations depending upon the nature of the shipping. There are mainly two categories of charter parties relevant to the issue at hand; contracts of affreightment and time charter parties. The following will present the essential features of these and some of the challenges might follow under each. Most challenging will be the implications under the time charter parties, but some potential issues under contracts of affreightment are also worth noting. The following examination will be limited to ships complying by switching to 0.5% fuel oil after 1 January 2020. Complying by installing scrubbers will be left out.

5.2 Contracts of Affreightment
A Contract of Affreightment (“CoA”) in this context refers to a contract which consists of many voyage charter parties. The essential feature of a voyage charter is that the owner ships something from one point to another on behalf of the charterer. The owner is responsible for providing and paying for everything that has to do with the ship operation, including fuel, hence, charterers are not responsible for anything regarding Annex VI requirements. Fuel prices and other costs are reflected in the freight rate. A single voyage charter will not be problematic in relation to the changeover date. Owners can predict their expenses and adjust the freight rate closer to the changeover date to cover their costs, such as higher fuel expenses.

A CoA on the other hand, can be long-term. Typically, by agreeing to ship a specific amount of commodity from one place to another over a certain period of time depending on the quantity. For example, a mining company that want their iron ore to be shipped from Fremantle to Durban continuously. Owners are responsible to use a ship capable of performing the shipment, and that the ship is seaworthy and compliant to all relevant legal regulations. Owners normally cover all cost related to the ship, which are reflected in the freight rate.

The interesting question for Owners in a CoA context is if they will have to consume all cost related to the changeover, or if some of it can be put on charterers. This will depend upon the wording of the contract. A long-term CoA often contain clauses enabling freight rate adjustments in situations where fuel prices change (Bunker Adjustment Factor Clause), or if new requirements are imposed that will change the operational cost. Owners will then be able to adjust the hire rate corresponding to the increase in fuel price after 1 January 2020. However, if such clause is not incorporated in the CoA or if the wording is not sufficiently supporting, Owners will bear all risks related to increased costs of fuel.

In addition to the increase in fuel expenses after 1 January there will be costs relating to the transitioning period prior to the changeover date. Due to lack of bunker capacity to hold both HSFO and LSFO which could allow a changeover at sea during a voyage transiting changeover date, most ships will needs to be in port when phasing out old non-compliant fuel oil, cleaning tanks, and replenish with new compliant fuel. Long sea voyages can last for weeks, and if the voyage is not planned so to be able to conduct this process at 31 December, which is likely not to be the case, owners will have no other choice than to switch to LSFO before the effective date. A Bunker Adjustment Factor clause will probably not enable an increased freight rate before 1 January, because HSFO will, strictly speaking, still be allowed to use. The seaworthy obligation upon Owners entail making sure the vessel has sufficient and correct quality fuel. Therefore a potential additional cost before 1 January will clearly be owners’ risk. If they are

160 Falkanger (2017) p. 442
able to get back some of this from charterers will depend upon the negotiation of contracts and some good-will from charterers.

The main rule is that the owner must provide a ship capable to carry out the voyage and therefor it is their risk if they start using more expensive fuel before it is strictly necessary. It is essential for Owners to address these issues when entering into contracts that will exceed the changeover date, and incorporate clauses that will enable an adjustments of the freight rate. Moreover, potential allocation of additional costs due to the transitioning must be negotiated.

5.3 Time Charter Parties

5.3.1 The General Responsibilities of Owners and Charterers

A time charter party is of a significant different nature than the CoA. The Owners lets a ship to a charterer over a specific period of time.\textsuperscript{161} It is still Owner’s responsibility to manage the ship and make sure the ship’s condition is compliant, i.e. that the ship has the necessary certificates.\textsuperscript{162} The charterer pays hire to the owner and bear the vessel’s variable expenses. It is charterer’s responsibility to provide and pay for fuel.\textsuperscript{163} The obligation for charterers to provide and pay for fuel is stipulated in both NYPE 93\textsuperscript{164} and SHELLTIME 4\textsuperscript{165}, both widely used standard contracts for time charters. This obligations is an absolute obligation, meaning that they must actually provide fuel, rather than merely exercise due diligence towards that end.\textsuperscript{166} For the charterer to provide correct quality and quantity fuel requires cooperation with the Owner. The master (owner) has a duty to supply correct information regarding quantity and quality as part of the obligation to provide a seaworthy ship.\textsuperscript{167} However, if no information is given, the responsibility of providing quality fuel fit for the vessel lies with the charterers, unless there are unusual requirements of the engines, beyond those to be expected of their type.\textsuperscript{168}

In order to ensure that charterers provide fuel of a certain quality, the charter party will normally contain bunker quality clauses which specify what fuels is to be used. These often refers to the international quality standard, ISO 8217. The International Organization for Standardization

\textsuperscript{161} Falkanger (2017) p. 500
\textsuperscript{162} Falkanger (2017) p. 507
\textsuperscript{163} Falkanger (2017) p. 326
\textsuperscript{164} NYPE 93 Cl. 7
\textsuperscript{165} SHELLTIME 4 Cl. 7
\textsuperscript{166} Coghlin (2014) p. 247
\textsuperscript{167} Coghlin (2014) p. 248 and 249
\textsuperscript{168} Coghlin (2014) p. 249
(ISO) has stated that these standards will be updated with new specifications before 1 January 2020 dealing with the new sulphur requirement.\textsuperscript{169} If not, the standard will not be applicable, and the owners should make sure that the bunker clauses are taking into account the sulphur limitation under Annex VI.

Many of the particular implications due to the changeover to 0.5% fuel oil is naturally not solved in a standard time charter party as the transition period will be a one-off event. How to handle the implications will be a matter of negotiation with the basic responsibilities in mind. The following raises some of the issues Owners and charterers will have to solve. Some of them are solved under new clauses published by BIMCO\textsuperscript{170} and INTERTANKO\textsuperscript{171} addressing the sulphur requirement and the transitioning period prior to 2020. These clauses reflect the basic responsibilities in time charter parties and their inherent risks.

5.3.2 Switching to 0.5% Sulphur Fuel Oil - Who Pays?

The new LSFO will be significantly more expensive than the HSFO of today. The same way as fluctuating bunker prices are owners’ risk under CoAs, it is charterers’ risk under time charter parties. They are obliged to provide and pay for fuel, and hence, they must pay the extra cost for new fuel types after 1 January. A hire rate adjustment due to higher bunker prices after 1 January 2020 must be negotiated in existing contracts. For contracts being concluded after the changeover date, the market will probably naturally adjust to higher fuel expenses.

As mentioned under 5.2, ships will probably have to change to the more expensive LSFO before the new 0.5% limit enter into force, due to a lack of capacity to carry both LSFO and HSFO and because the vessel needs to be prepared in port. Charterers will of course want to burn cheaper HSFO as long as possible.

Under time charter parties, the charterers are in charge of what voyages to make and when they shall occur. If they are ordering a long sea voyage starting 5 December that will exceed the changeover date, there can be little doubt that should must pay the extra cost of burning HSFO the whole trip. It is also stipulated in both BIMCO and INTERTANKO 2020 bunker clauses that charterers shall have provided the vessel with sufficient compliant fuel so that on 1 January the vessel will have sufficient compliant fuel to reach the nearest bunker port. If the vessel does not allow for a changeover at sea, this must be a risk for charterers to bear as they have entered into contract knowing those limitations of the ship.

\textsuperscript{169} Ship & Bunker (2018b)
\textsuperscript{170} BIMCO 2020 and BIMCO 2020 Transition
\textsuperscript{171} INTERTANKO 2020
5.3.3 Bunker on Redelivery

Normally, when a ship is delivered, the charterer buys the fuel present in the tanks, and on redelivery, the owner buys back the remaining fuel.\textsuperscript{172} For vessels being redelivered close to the changeover date, buying back non-compliant fuel makes little sense as this fuel will be worthless after 1 January 2020. Rather, disposal of this fuel will be a cost for the owners. This issue needs to be addressed in the contracts. INTERTANKO bunker compliance clause handles this problem by adding a responsibility for charterers to redeliver the vessel with a certain amount of non-compliant fuel and compliant fuel oil, depending on the time of redelivery.\textsuperscript{173} Moreover, both BIMCO and INTERTANKO puts the responsibility of disposal of old fuel on to charterers.\textsuperscript{174}

5.3.4 Risk of Non-Availability

As mentioned above under 4.2.3, the availability of new type of 0.5% fuel oil is a concern, especially in the beginning phase. Annex VI is not meant to make ships deviate or be unduly delayed in order to obtain compliant fuel and allows ships to bunker non-compliant fuel to reach next port.\textsuperscript{175} However, evidence that all reasonable action is taken to avoid this must be provided by the charterers. The risk is that some states might interpret the requirements more strict than others, and it is likely that disputes will arise between owners and charterers if vessels are penalised. As it is charterer responsibility to provide fuel, they will also be liable for any loss incurring if failing to obtain compliant fuel. Any risk of non-availability is inherent in their obligation to provide fuel.

Another issue of non-availability is left over fuel after a voyage. Due to ensuring that the ship safely reaches next port, vessels normally bunker 20% more than what is strictly necessary in case of extreme weather or other emergencies. If a vessel is forced to bunker non-compliant fuel oil, there will be a 20% extra fuel that will need to be disposed of at next port. This risk will also be charterers’. They will have to dispose of this extra fuel and make sure the ship bunker compliant fuel for the next voyage.

5.3.5 Conclusion

The allocation of responsibilities and risks in respect of bunkers are clear. Under a CoA the owners must provide and pay for fuel, and under time charter parties this responsibility lies with the charterers. The risks inherent with the obligation to provide fuel will lie with that party. The

\textsuperscript{172} NYPE cl. 9 and SHELLTIME cl. 15
\textsuperscript{173} INTERTANKO 2020 cl. 4.1
\textsuperscript{174} INTERTANKO 2020 cl. 9.1 b. and BIMCO cl. (c)(i)
\textsuperscript{175} Annex VI Reg. 18 (1)
owners are always responsible to provide a compliant vessel. The legal challenges lies with the practicalities arising due to the changeover to 0.5% fuel oil, especially under time charter parties. The new BIMCO and INTERTANKO clauses solve many of these issues, and incorporating these sort of clauses into time charter parties will be essential.

To conclude, the essence is that the particular issues relating to transitioning to LSFO must be handled by cooperation and negotiations in good faith between the parties. Both BIMCO and INTERTANKO urges this cooperation in their clauses.\textsuperscript{176} The issues surrounding the transitioning period are of a practical nature and will be bypassing, but is likely to cause some headaches for both parties.

\textsuperscript{176} BIMCO 2020 Transition cl. (b)(ii) and INTERTANKO 2020 Cl. 5
6 Concluding Remarks

The main objective of this thesis was to do a detailed study of the sulphur requirement under MARPOL Annex VI, developed by IMO. Regulation 14 of Annex VI is targeting sulphur emissions from ships, and after 1 January 2020, the global limit of sulphur composition in fuel will change from 3.5 % to 0.5%, which means a significant change toward a green industry.

This thesis has highlighted some of the complexity and challenges tied to this reduction of sulphur in fuel. For the shipping actors, they need to make a choice whether to install cleaning systems or use new fuel, while the enforcing states need well established and efficient routines to control that the ships comply with the regulation.

The shipping actors have encountered a difficult choice since it is impossible to predict the upcoming fuel price for the new 0.5% sulphur fuel oils. The task is deceptively simple, try to predict if installing scrubbers and use old fuel is more cost-effective than just buying the new type of fuel. To make it even more complicated, open-loop scrubbers have already been banned in certain coastal waters due to the potential negative effects on the marine environment. However, if fuel price with 0.5% sulphur escalate above a certain threshold, installing scrubbers will be the best financial option for ships engaged in long sea voyages.

Flag states have the primary responsibility of making sure their ships comply with the regulation. The sulphur requirement is to some extent of a static nature, which flag states are able to control. On the other hand, the requirement is also of a non-static where annual surveys will not be a sufficient control mechanism. Therefore, port state control will play a significant role in enforcing Regulation 14. The bunker delivery note function as an important tool to restrain fuel suppliers from delivering non-compliant fuel oil, but one is dependent on port states to take further tools into use, such as sniffers. When taking enforcement further than merely what is set out in MAPROL coastal states have to consider their jurisdictional limitations of international law.

Thus, controlling ships outside of territorial waters will be difficult. The carriage ban for 1 March 2020 will reduce this difficulty, and MEPC is continuously working on new methods to ensure a high compliance rate. IMO’s wide global recognition as the top law-making authority in the maritime industry, where actors from all sides of the industry takes part in developing the rules, makes their legislation highly respected. This recognition is important, as one relies upon the industry to create a compliant culture, appreciating the importance of preventing sulphur emissions for the sake of human health and the environment.
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Vienna Convention


**Standard contracts and clauses**

- **BIMCO 2020**

- **BIMCO 2020 Transition**

- **INTERTANKO 2020**

- **NYPE 93**

- **SHELLTIME 4**

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- **Bomin Group (2015)**

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<th>Source</th>
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