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The actions adopted at the universal and European Union level to cope with the sulfur pollution from ships.

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ABSTRACT

Marine pollution from ships and, specifically, sulfur pollution from the fuel used by this transport, has been the focus of the current work. Sulfur pollution emitted by about the 60.000 ships there are in the world is responsible for both environmental and health damages, causing harmful effects such as acid rain and even human deaths. This research aims to answer the reason of this dangerous situation. In this way, it has been analyzed the regulation adopted at the universal and European Union level to cope with this problem. At universal level, we have seen the UNCLOS, MARPOL, and Geneva Convention as a binding instruments, and then, the Stockholm and Rio Declarations, and the IMO guidelines as the soft law to deal with SO_x pollution. At the EU level, we have focus mainly in the specific Directive related with the sulfur pollution, such as the Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulfur content of certain liquid fuels amended by Directive 2005/33/EC and Directive 2012/33/EU.

ABBREVIATIONS

CJEU	Court of Justice of the European Union
EC	European Community
ECAs	Emission Control Areas
EGCS	Exhaust Gas Cleaning Systems
EMEP	European Monitoring and Evaluation Programme
EMSA	European Maritime Safety Agency
EU	European Union
IAPPC	International Air Pollution Prevention Certificate
ICJ	International Court of Justice
IMO	International Marine Organization
MARPOL	International Convention for the Prevention of Pollution from Ships
MEPC	Marine Environment Protection Committee
NGO	Non-governmental Organization
SECA	Sulfur Emission Control Area
SO_x	Sulfur Oxides
TEU	Treaty on the European Union
TFEU	Treaty on the Functioning of the European Union
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
WHO	World Health Organization

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I. INTRODUCTION

This research is about the air emissions from ships, specifically sulfur dioxide as a pollutant emitted from vessels. The reason we have chosen this topic is due to a documentary broadcast last year in TV3, a Catalan television channel, about shipping entitled “*FRIGHTENED: The real Price of shipping*”¹. This documentary opened our eyes to a problem which is not really known in society: the mechanics and dangers of the shipping industry and the weak regulation to cope with it.

The shipping industry is a key player in world economy and forms the basis of our model of modern civilization, since nowadays 90% of the world trade is carried by this companies². However, the workings and regulations of this business remain largely obscure to many. This is something we may find acceptable when our consumer goods are cheap, but not when we look further into the issue and we realize about the hidden costs which affect us all.

To make this business profitable the shipping industry circumvent the environmental, labour and taxes regulations, among other normative, by using open register systems. Being able to operate at the limits of law and justice is possible thanks to the shipping flags of convenience. This allows ownerships to run out the regulation of their country. This situation is known as *maritime blindness*, but we have to be conscious that this situation is only possible because the system permit it.

One of the aspects which really caught our attention was the damage that the shipping industry is doing to the environment. The pollution caused by ships is important in many different ways. Although the most well-known one is the oil contamination, as its effects are more visual, there are other types of pollution more harmful such as the air pollution. Actually, a report from World Health Organization (WHO)³ shows that in 2012 around 7 million people died - one in eight of total global deaths – as a result of air pollution exposure. This confirms that air pollution is now the world’s largest single environmental health risk. For the impact of this *silence killer* we decided to focus our research in this issue.

¹ DELESTRAC, D. (dir.), *FRIGHTENED: The real Price of shipping*, 2’40’’, Polar Star Films, 2016.

² INTERNATIONAL CHAMBER OF SHIPPING (ICS), *Shipping and World Trade* <<http://www.ics-shipping.org/shipping-facts/shipping-and-world-trade>> [29/04/2017]

³ WHO, *Burden of disease from Household Air Pollution for 2012*, p.14-15, <http://www.who.int/phe/health_topics/outdoorair/databases/FINAL_HAP_AAP_BoD_24March2014.pdf?ua=1> [29/04/2017]

The problem we are analyzing has to do with the residual fuel that vessels use to work. In fact, what remains in the bottom of the barrel of fuel oil is what is used as fuel for ships because it is low price due to its density and dirt. This residual fuel has a high content of sulfur in its composition which, in the past 10 years, have produced a huge impact in environment, but also in the human health. The ship industry is burning sulfur at an average of 3.000 to 3.500 ppm, parts per million. To get an idea of the magnitude of this situation, a car in European Union (EU), according to its law⁴, has to burn sulfur below 15 ppm. The reality shows that one vessel burns the same amount of sulfur that 50 million cars in EU; then the 20 largest ships in the world are polluting more than all cars of the planet. However, there are not only 20 ships; truly, there are about 60.000 ships that roam the oceans pouring particles in the atmosphere⁵.

This sulfur pollution, as a *killer hidden* from society, makes us ask our self a several doubts such as why the system is permitting this situation and how the regulation at the universal and EU level is working to cope with this problem. May the weight of the economy be more important than the future of the present and next generations? Why? In that point, we decided to center our research in the investigation of the sulfur dioxide problems emitted from ships and how to deal with it.

The methodology that we will use to find answer to our questions will be a combination of legal doctrine with other sciences, such as international trade, marine sciences, air pollution, and health sciences, and with other disciplines as the international relations and sociology. However, we would like to point out that our approach will be characterized by the predominance of the legal analysis. In this way, the other disciplines will only provide additional interpretative support for the legal focus and they will be useful to understand the behavior of the actors within the regime.

In base of this methodology, we have analyze the normative that could affect to sulfur pollution. First, we will see the problem and the general aspects of this kind of contamination, such us the agents which act in its legal framework and the use of

⁴ Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC, *OJ L 140*, 5.6.2009, p. 88–113.

⁵ DELESTRAC, *op cit.*, 46⁷.

shipping flags. Secondly, we will focus in the universal effort to deal with the problem, with binding and non- binding regulation. Finally, we will get our attention on the EU level. We will examine this questions taking into account the impact of the open registers systems in the use – or not use - of these regulations.

The final objective of our work is get our doubts solved, but also that people who read it may delve a little deeper into this world that seems to be unknown to society, although is affecting much more than we think.

II. GENERAL ASPECTS ON SHIPS POLLUTION.

A. Ships contamination with special reference to sulfur pollution.

1. Types of ship pollution.

The environmental impact of shipping industry affect in a different ways which includes oil, chemicals, garbage, sewage, air pollution from the ship's, engines bunker fuel and the anti-fouling paint on a ship's hull. Marine pests in ship's ballast water or clinging to the ship's hull can also damages new environments. Actually, even old ships, which are been broken up or scrapped, and they lies down on beaches of non-developed countries, like India and Bangladesh, are polluting. However, non-great care is taken in this ships graveyards⁶.

The most common cause of oil pollution by ships comes from what are called operational oil spills. These are caused mostly by human error or sometimes intentionally when the ship's crew does not follow the regulations. This kind of pollution from ships is the visual and consequently the known best for the society⁷.

Nevertheless, although pollution by noxious liquids substances in bulk, by harmful substances carried by sea in packaged form and by sewage from ships are less visual, their impact on the environment is as important as oil pollution⁸. Also, the noise of the big shipping routes affects to the environment and alter in an unspeakable levels the marine ecosystem. In fact, acoustic pollution from ships is destroying the marine ecosystem; as an example, the habitat of hunchbacked whales has been reduced in 90%⁹. In the same line, the impact of the ballast water, as a type of pollution from ships, is also harmful in high levels de marine ecosystem¹⁰.

Those are the different kinds of ships pollutions, and now we will focus on the air pollution as sulfur is included in this class.

⁶AUSMEPA, *Types of pollution from ships that can affect the marine environment* <<http://www.ausmepa.org.au/ships-and-the-marine-environment/5/types-of-pollution.htm>> [08/04/2017]

⁷ In order to exemplify, we must highlight the Torrey Canyon case at the Britain coast in 1967, Erika in the French coast in 1999, and Prestige in the Spanish coast in 2002 as a big environmental disasters related with this kind of pollution caused by sinking of tankers.

⁸ CLARK, R., *et. al.*, *Marine pollution*, 5th ed., Clarendon Press, 1997, p.51-62.

⁹ DELESTRAC, *op cit.*, 38'.

¹⁰ See RAMIREZ, F., *El régimen internacional de la bioinvasión marina causada por agua de lastre: especial referencia a la República de Colombia*, doctoral thesis, UAB, 2015.

2. *Sulfur pollution from ships.*

Conventional vessels engines are burning heavy fuel oil¹¹ or gas oil¹² with high concentrations of harmful substances, including heavy metals, hydrocarbons and sulfur oxides (SO_x), as well as particulate carcinogenic material. In this way, we can differ various kinds of ship's air pollution. As an example, we have substances that affect to climate change and others that deplete the ozone layer, principally due to carbon dioxide combustion. In fact, carbon footprint from ships pollutions is the equivalent of Germany or Japan States; actually, vessels industry is the responsible for the 2,5% of global gas emissions. One of the devastating effects is that every year the ice of the Arctic is reducing 37.000km² in area, and worst is that the shipping industry is having this opportunity to open new sea lines which still increase the pollution¹³. However, this kind of pollution from the ships industry is almost irrelevant in comparison with other industries, as the electricity industry. In this way, of all of these damaging substances, we have focus our research in sulfur pollution from ships, and for this reason, we will not analyze the regulation related with climate change and ozone layer as is not one of the substances that affect to those kind of contamination¹⁴.

When we talk about sulfur pollution everyone refers to the car industry as the main agent that most contributes in this emissions, but nobody criticizes shipping industry although they are burning the dirtier fuel in the world. Actually, as the Non-governmental Organization (NGO) Transport & Environment said "*marine fuel is 2,700 times more polluting than road diesel and the latter pays 35 billion euros annually in fuel taxes in Europe, while ships use tax-free fuel*"¹⁵. Therefore, the environmental impact of the air pollution emitted from vessels is at least as harm as those provoked by cars industry.

Sulfur pollution is a problem for everyone, as it is the main substance of acid rain and it has dangerous effects for the human health. Moreover, is not dangerous just for who

¹¹ Heavy fuel oil is a fraction obtained from petroleum distillation, either as a distillate or a residue and it refers only to the heaviest commercial fuel that can be obtained from crude oil.

¹² Gas oil is a liquid hydrocarbon with a density of 832 kg / m³ (0.832 g / cm³), consisting mainly of paraffins and used mainly as fuel.

¹³ IMO, *Third IMO Greenhouse Gas Study 2014*, 2014.

<<http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Third%20Greenhouse%20Gas%20Study/GHG3%20Executive%20Summary%20and%20Report.pdf>> [22/04/2017]

¹⁴ CLARK, *op cit*, p.126-148.

¹⁵ NGO TRANSPORT & ENVIRONMENT, *Transport is now Europe's biggest problem report*, 2016, <<https://www.transportenvironment.org/transport-biggest-climate-problem/>>[08/03/2017]

lives close to this source of contamination. Actually, the process of oxidation that creates the acid rain is produced in the atmosphere, where sulfur dioxide and nitrogen oxides react with water, oxygen, and other oxidants to form a mild solution of sulfuric acid. These gases are oxidized in the atmosphere and react with rainwater and form sulfuric acids. Then, they can be transported in the breathable particulate material. Rainwater, snow, fog, and other forms of precipitation containing those mild solutions with a pH of less than 5.0, fall to earth and marine areas as acid rain. In some instances, these gases and particles can run away from where they settle. That's the reason why they are known as a type of long-range trans-boundary air pollution. In general, the average time of permanence SO_x in the atmosphere is around 3-5 days, and it can be transported to greater distances¹⁶.

It is important to point out, that as we have said, the sulfur dioxide pollution from ships affects both environment and health. Now we will make a concise explanation of the effects of this pollution caused by SO_x.

In the one hand, sulfur dioxide is really dangerous for the environment and the main factor of acid rain. It has been shown to have adverse impacts on forests, freshwaters and soils, killing insect and aquatic life-forms as well as causing damage to buildings¹⁷.

In the other hand, the exposure to sulfates and the exposure to acids derived from SO_x are extremely risky for people's health because these compounds enter into the circulatory system directly through the airways. Sulfur dioxide is also associated with asthma, chronic bronchitis, morbidity and mortality increase in old people and infants. Shipping emissions are an *invisible killer* that causes lung cancer and heart disease¹⁸. In fact, researchers say that the 60.000 deaths caused each year from ships pollution, 12.000 are attributed to sulfur dioxide¹⁹.

¹⁶ SMITH, S., *et al.*, "Anthropogenic sulfur dioxide emissions: 1850–2005", *Atmospheric Chemistry and Physics*, 11(3), 2011, p.1101-1116.

¹⁷ See LINK, K., *Acid rain and trees: an appraisal of the evidence for damage to native tree species by air pollution and acid precipitation in the United Kingdom*, Nature Conservancy Council, 1987.

¹⁸ GARAMENDI, M., *et al.*, "A propósito de un caso de autopsia médico legal tras un episodio de polución atmosférica", in *Mortalidad asociada con la contaminación atmosférica por SO₂*, p. 43-56 <<http://scielo.isciii.es/pdf/cmfn33/original5.pdf>> [12/03/2017]

¹⁹ WHO, *Guías de calidad del aire de la OMS relativas al material particulado, el ozono, el dióxido de nitrógeno y el dióxido de azufre*, 2015, p.3 and 19-23. <http://www.who.int/phe/health_topics/AQG_spanish.pdf> [12/03/2017]

B. The use of shipping flags to skip from the legal framework.

According with article 91 of United Nations Convention on the Law of the Sea of 1982 (UNCLOS) “ships have the nationality of the State whose flag they are entitled to fly”. In this sense, the regulation governing the ship at high seas²⁰ is that of the flag State.

In this point, the use of shipping flags allows, on the one hand, to the owners of ships to flown with a flags different from its nationality and to obtain important profits since they do not have to respect the environmental, safety, labor, tax, etc., regulations of its own State.

And, on the other hand, the States who open their registers to foreign ship-owners gain important income from the matriculations of ships in its nationality flag²¹. This system of open registries has been an opportunity for many countries – including developed States as many small islands, such as the Marshall Islands, and least developing countries, such as Liberia – to provide the services of vessel registries.

Moreover, the majority of ship-owners from developed States remain in those States with open registers systems. Thus, due to this shipping flag business, those owner-ships become more competitive in front of fleets owned by companies based in developed countries with stricter legal framework.

Actually, due to the open registers systems, tonnage registered under a foreign flag is world total 70,2% of the float²²; thus most of the vessels are skipping his national law by this mechanism.

To appreciate the problem we will see in the following tables the big difference between the top five nationalities of flags of registration fleets and the five top owners-ships nationality which represents the represents the 49,89% in 2016²³.

²⁰ See p.22 of this research about the UNCLOS.

²¹ See DOMÍNGUEZ, M., El registro de buques, embarcaciones y artefactos navales, Dilex, 2005.

²² UNCTAD, *Review of Maritime Transport 2016*.

<http://unctad.org/en/PublicationsLibrary/rmt2016_en.pdf> Pag. 30-50 [11/03/2017]

²³ *Ibid*, p.37.

Table 1: Flags of registration with largest registered fleets, 2016

States	Number of vessels	Share of world total weight tonnage
Panama	8.153	18,51%
Liberia	7.843	11,42 %
Islas Marshall	5.320	11,07 %
Honk Kong	4.052	8,96 %
Singapore	3.185	7,04 %

Table 2: Ownership of world fleet, 2016

States	Number of vessels on national flag	Number of vessels on foreign flag	Total of vessels	Total as percentage of world	Vessel share using shipping flags
Greece	728	3.408	4.136	16,36%	82,4%
Japan	835	3.134	3.969	12,78%	78,96%
China	3.045	1.915	4.960	8,87%	63,55%
Germany	240	3121	3.361	6,65%	92,86%
Singapore	1.499	1.054	2.553	5,32%	41,28%

On one side, as we can see in the illustrated Table 1, at 1 January 2016, Panama, Liberia and the Marshall Islands are the largest vessel registries, followed by Hong Kong and Singapore, and together accounting for 57 % of world tonnage²⁴. On the other side, the Table 2 shows that the countries with more ownerships of world fleet are Greece, Japan, China, Germany and Singapore²⁵. It is important to point out how the States more implicates to cope with environment problems and maritime safety, it means, the EU countries and Japan, have a big difference between the vessels registered in its own

²⁴ See ALDERTON, T., *et al.*, "Globalisation and de-regulation in the maritime industry", *Marine policy* 26(1), 2002, p.35-43.

²⁵ *Ibid*, p.44-45.

country and vessels under shipping flags. As an example, Germany has the 92,86% of his float skipping its national and EU law. In addition, if we focus our attention in those shipping companies by number of ships - and total shipboard capacity deployed-, we will see that whose nationality also differs from the nationality of flags registers and ownerships nationalities (*vide* Table 1 and 2). As an example, we can see the top five container ships industries and its nationality, in Table 3 that represents 50,3 % the of market share²⁶.

Table 3: Top five of the container industries

Ship companies	National State	Market share
Maersk	Denmark	15.1%
Mediterranean Shipping Company (MSC) SA	Suitland and Italy	13.4%
CMA CGM S.A	France	9.2%
China Ocean Shipping	China	7.8%
Hapag – Lloyd	Germany	4.8%

This situation has a huge impact on the environmental regulation because, despite of the efforts of States to implement environmentally beneficial regulations, the shipping flags business allows to those industry to avoid such control. As an example, Greece, the EU State with the world's largest naval fleet, has just 728 of the 4.136 vessels restarted with the national flag and complaining with its domestic and EU regulation. The rest of the float is skipping those regulations by using foraging flags, principally Malta, Liberia and Marshall Islands. We shall transpose this situation to the global level to understand how dangerous the use of shipping flags is since they allow the shipping industry to escape to assume any responsibilities for environmental damage. The case of the oil tanker called Erika is a clear example of the use of shipping flags to avoid the ship-owners responsibility²⁷. The vessel Erika was sank flying the Maltese pavilion in the French coast at the 90th and caused a released of 30.000 tons of oil into the sea, and the

²⁶ *Ibid*, p. 40.

²⁷ NGO SHIPBREAKING PLATFORM, *What a difference a flag makes*

<http://www.shipbreakingplatform.org/shipbrea_wp2011/wp-content/uploads/2015/04/FoCBriefing_NGO-Shipbreaking-Platform_-April-2015.pdf> [22/04/2017]

spill polluted 400 km of coast and killed tens of thousands of animals. The fact that it was impossible to find a responsible for this environmental disaster, although all the French police and judicial efforts were working in it, alerted the world to show how open register systems allows to skip the environmental responsibility through ghost companies²⁸.

C. Actors to deal with the problem of sulfur pollution.

1. Actors with shipping interests

Maritime transport is a priority in international commerce, in fact, 90% of our products are transported by ships²⁹. In order to understand its functioning it is necessary to identify the main interests linked to the exploitation of this business.

a. States with shipping interests

Developed States dominate the international shipping industry through strong vested interests in the ownership of ships, insurers, and other maritime industries. The main States committed to these interests include the United States, Japan and European countries such as the United Kingdom, Norway, Germany, Netherland and Greece. According with TAN, in this field the influence of the United States, in comparison with other States, is unparalleled as it is the dominant player because of its economic capacity and its status as the holder of the largest oil companies in the world. Likewise, they are probably the only country that can impose unilateral legal frameworks on foreign ships outside the protection of international legal frameworks and even extraterritorial laws without serving their own interests. This is because most of the tonnage of this country is registered in open registries systems, especially in Liberia and Bahamas³⁰.

The importance of the European States is mainly based on the influence of their common and coordinated economic positions in the International Marine Organization (IMO). In addition, the importance of these countries and their economies in the maritime industry are very significant. However, those countries do not have a real

²⁸ DELESTRAC, *op cit*, 24⁷.

²⁹ ICS, *op cit*.

³⁰ TAN, A., *Vessel Source Marine Pollution: The Law and Politics of International Regulation*, CUP, 2006, p.37-40.

representation in the IMO. Quantitatively speaking, Greece accounts for 16% of the world fleet, but the 82,4% of its fleet is registered in open registries specially in Panama and Malta, which have the representation in the IMO³¹.

b. Others actors with shipping interests

The actors with shipping interests are focused in the economic interest of their industries; they pursue the free trade and free navigation over the oceans. Basically, the actors we must highlight are the owners of vessels as they are natural or legal persons that has the capacity to operate the vessel directly or indirectly. Secondly we have the ship-owner who outfits and operates a ship with a commercial aim and that can or cannot be the owner of the ship. This ship-owners have and strength relation with charterers who contracts with the shipper the total or partial use of the ship for its commercial uses. The charterer is the nucleus that determines the behavior and interests of the owners of the cargo in relation to the regulation of marine pollution³².

Other agents with interests in this sector are the Protection and Compensation Clubs and the Classification Societies. The former are associations of ship-owners and owners, and are responsible for collectively covering claims and compensation of the sector. The Classification Societies have the function of advising the shipping industry on the design and development of regulations affecting the hull, machinery and equipment of ships, in order to promote the safety of life at seas and safeguard protection of the environment. However, to the extent that these Classification Societies are left in a market of free competition, in which it is the shipping agents who accuse it to report and pressure from this lobby. Thus, we move with the incongruity that the same ship owners pay those who impose financial burdens as a result of their inspections³³.

2. Actors with environmental interests

Is the interest to give answers to the growing problems of air pollution from ships which has motivated at the international level a multiplicity of actors and forums where these

³¹ UNCTAD, *op cit.*, p.44-45

³² DOMÍNGUEZ, *op cit.*, p. 14-32

³³ RAMIREZ, *op cit.*, p. 19-24

problems are addressed and debated, originating, as a consequence, a magma of regulations whose legal qualification is far from obvious.

a. International Maritime Organization (IMO).

The IMO³⁴, as the specialized agency of the United Nations (UN) for the safety and security of shipping, is the main authority in the international level to cope with environmental problems caused for ships.

The IMCO/IMO initially had as its function "*establish a system of consultation among members and exchange of information between Governments*"³⁵, it means that it did not have the capacity to adopt draft treaties. This situations move on in 1982 when IMO change his consulting function to become the main organization in the international maritime level with enough authority to adopt treaties and to control its application.

Nowadays, its main function is to create regulatory framework for the shipping industry at the international level. Thus, IMO is responsible

"to provide machinery for cooperation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships"

as the article 1.a of the IMO Convention of 6 March 1948 exposes.

The Council of IMO³⁶ establishes the bases of marine environmental law at the international level, and is the most important organ of elaboration of soft law. The

³⁴The IMO, at the time of its creation known as the Intergovernmental Maritime Consultative Organization (IMCO), was established with the initiative of the Economic and Social Council in 1948, by the United Nations Maritime Conference held in Geneva. In 1982 it was renamed into IMO, and now days it has 172 States members, more Hong Kong, Feroe Island and Macao as members associated.

³⁵ IMO, *IMO 1948-1998: Un proceso de cambio*, p.36.

<<http://www.imo.org/knowledgecenter/centre/referenceandarchives/focusonimo>>. [02/02/2017]

³⁶ To understand how IMO works it is important to point out the two main organisms of his structure. In the first place, the Assembly is responsible for approving the program of work, voting the budget and establishing the financial regime of the Organization. In the second place, the Council is the executive

reports and guidelines from the IMO serve, in addition, for the adoption of subsequent international treaties. In this line, IMO is an important actor to cope with the environmental problems and the sulfur dioxide matter in specific as it's a pollutant from ships³⁷.

However, it's important to pick up that IMO interests can be forced by the States members of the Organization as they have strong commercial interests and they are into the business of shipping flags. Actually, we shall focus in the peculiar form of financing IMO as its costs are divided by the 172 Member States in function of the size of its naval fleet. Thus, the States with more ships flying their pavilions, Panama and Liberia, assume the largest proportion of the budget. Therefore, due to the pressures of these two countries, as the main beneficiaries of the revenues of the open registries systems, IMO do not establish an effective regulation to end the business of the shipping flags, neither those makes a regulation that can harm those States³⁸.

b. Other actors with environmental interests: Non-Governmental Organizations (NGOs) and States with maritime interests.

NGOs are influential actors in the international and the EU level to deal with environmental legislative processes since the UN Declaration on the Human Environment of 1972 and play an important role. They work basically to pursue the protection of environmental problems by creating social alarms with the aim to creation, training, maintenance and execution of international legal instruments through their scientific contribution and political power on the rise. It is noteworthy that in recent years NGOs, as for example Greenpeace, have exerted a visible activity in the conferences where international environmental treaties were negotiated and adopted³⁹.

organism of IMO, elected by the Assembly, and it is responsible for supervising the work of the Organization and enter into agreements or arrangements concerning the relationship of the Organization with other organizations, subject to approval by the Assembly or coordinate the activities of the organs of the Organization.

³⁷ RAMIREZ, *op cit.*, p.36-42.

³⁸ TAN, *op cit.*, p.77-78.

³⁹ ALKOBY, A., "Non-State Actors and International Law", *Kluwer Law International*, 3, 2003, p.23-46.

However, we have to bear in mind that NGOs do not have international personality⁴⁰, and its actions are limited by States with shipping interests.

States with marine interests are other important actors in the field of protection of environment, as they pursue the protection of their adjoining waters and provide for strict monitoring of foreign vessels under their jurisdiction. According with TAN the main actors in the protection of its interests, due to the fishing economic fact, are mainly Australia and Canada⁴¹, and also, New Zealand and Ireland. The main reason of his actuation is that this States barely have shipping interests in contraposition to USA or Greece, as they do not have strong maritime commercials relations⁴².

⁴⁰ This statement is confirmed by art. 71 of the Charter of the UN signed, which defines NGOs, as well as in Article 1 of the European Convention on the Recognition of International Legal Personalities of NGOs.

⁴¹ It is important to note that international negotiations to adopt the UNCLOS were led by Canada in coalition with other developing countries to claim exclusive jurisdiction over the protection of the environment, as well as for the exploitation of natural resources.

⁴² TAN, *op cit.*, p.72.

III. UNIVERSAL REGULATION OF SULFUR POLLUTION.

A. Firsts steps in regulation of sulfur pollution.

The environmental law is one of the youngest field of law, for this reason, the regulation about air pollution and specifically on sulfur dioxide in specific is relatively recent. It is a fact that the industrial revolution, as a process of economic, social and technological transformation initiated at the end of 18th century in the United Kingdom, set up a turning point in history, modifying and influencing all aspects of life. It also established a definitive change between economic activity and the environment Moreover, with the rise of this industrialization process, fossil fuels were the main use and the principle source of pollution, therefore, and the air pollution was more evident. In this context, air pollution caused by industry is identified as a big problem, caused mainly by the energy requirements.

The regulation about the atmosphere protection increase since the disaster of December 1952, when London was invaded by a fog associated with an anticyclonic regime and a thermal inversion. As a result of the low temperatures and the weather conditions, the cloud of smoke caused by the increase of the use of fuels persisted over the city for several days. This fog was very harmful to the health because the fuels that produced it had high content of sulfur. This so-called *killer fog* was really dangerous to health and it caused the death of 4.000 people in the immediate days of the disaster, basically children, elderly people and people with respiratory problems, and 8.000 more along of the following months⁴³.

After the II World War the concert for the destruction of the marine environment began to beat. In this context appeared among of instruments of protection like the London agreement to prevent the maritime pollution from fuels of 1954⁴⁴.

In the sixties, the first scientific reports on the deterioration of the biosphere drives more and specific regulation. Actually, it was due to *Torrey Canyon* accident in 1967⁴⁵ that

⁴³ WISE, W., *Killer Smog: The World's Worst Air Pollution Disaster*, iUniverse, 2001, p.30-38

⁴⁴ In this context we find more treaties related on the marine environment as the Antarctic Treaty of 1959, the Moscow Treaty of 1963, and the Outer Space Treaty of 1967.

⁴⁵ See GIL, C., *The wreck of the Torrey Canyon*, David & Charles, 1967, and PETROW, R., *The Black Tide*, Hodder & Stoughton, 1968.

the regulations on maritime environment were more extensive, but they were basically about fuel pollution but not air pollution⁴⁶.

In the following years, the issue of controlling air pollution from ships - in particular, noxious gases from ships' exhausts – was discussed in the lead up to the adoption of the international convention for the prevention of pollution from ships of 1973 (MARPOL). However, it was decided not to include air pollution at the time, and it was included in 1997 with the Annex VI for the prevention of air pollution from ships⁴⁷.

The first important step that was taken at the international level to cope with the environmental pollution was the Stockholm Conference on the human environment of 1972. As the first Declaration about human environment driven by United Nations with the aim of persuading governments to develop legislation necessary to limit emissions of toxic chemical pollutants into the environment. In this context, the policies that were developed, both nationally and globally, were few, slow and insufficient⁴⁸.

During the seventh, several studies confirmed the hypothesis that air pollutants could travel several thousand kilometers before deposition and damage occurred. As a consequence, in 1979, a ministerial meeting on the protection of the environment, in Geneva, adopted the Convention on Long-range Transboundary Air Pollution by 34 governments⁴⁹. This was the first international treaty to deal with problems of air pollution on a broad regional basis. In the same line, in the following year were adopted 8 Protocols to cope with this problem. However, the Bhopal disaster of 1984 in India shows us that the regulation was not enough⁵⁰.

The 1982 was an important year in the field of environmental law since it was created the World Commission on Environment and Development, and it was adopted the World Charter for Nature as a declaration stating that environmental protection, human rights, egalitarian development and peace are interdependent and indivisible. Additionally, in 1982 it was also established the United Nations Convention on the Law

⁴⁶ In this contexts appear among of instruments like the European Charter of the water of 1968, the Bonn Convention for combating pollution of the sea by oil in case of accident of 1969 and the he Brussels Convention on the intervention on the high seas in cases of accidents caused by oil pollution of 1969.

⁴⁷ BIRNIE, P., *et al.*, *International Law & the Environment*, OUP, 2009, p 403-414.

⁴⁸ *Ibid*, p.115-120.

⁴⁹ BORRÀS, S., *Los regímenes Internacionales de protección del medio ambiente*, Tirant monografías, 2011, p.95-108.

⁵⁰ See LAPIERRE, D.; MORO, J., *Past Midnight in Bhopal: The Epic Story of the World's Deadliest Industrial Disaster*, Warner Books, 2003.

of the Sea which defines the rights and responsibilities of nations with respect to their use of the world's ocean. One year later, under the chairmanship of Dr. Brundtland, Prime Minister of Norway and former Minister of the Environment, the work was intensified related to environmental and health issues. As a consequence, the report *Our common future* in 1987 established fundamental guidelines on environmental problems and called for sustainable development to meet the needs of present generations without compromising the satisfaction of the needs of future generations. Actually it was the start point of the Rio Declaration on environment and development of 1992 in order to strengthen cooperation⁵¹.

In the field of Sulfur Dioxide there was not important steps in the international level since the Annex VI of MARPOL that entered into force in 2005 and established limits for those emissions. In parallel, we also have the IMO guidelines which contributes on the protection of the environment from the SOx emissions from ships with soft low instruments.

Now, our research will focuses on the international actions aimed on the development of instruments at universal level that have an impact on SOx pollution from ships.

B. Binding Regulation.

The so-called soft law is characterized precisely by its non-mandatory nature, focused on prospective commitments, generic guidelines and non-self-executing rules. That is the reason of the main character of binding regulation to implement mandatory rules to establish real control and obligations to do or not to do.

1. United Nations Convention on the Law of the sea of 1982 (UNCLOS).

The UNCLOS⁵² defines the rights and responsibilities of States with respect to their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources. The Convention also provides the framework for further development of specific areas of the law of the sea.

The dioxide sulfur as a pollutant emitted by ships is generically regulated by UNCLOS. With the application of this Convention we can know the national regulation of sulfur

⁵¹ JUSTE, J., *Derecho internacional del Medio Ambiente*, Mc Graw Hill, 1999, p.16-36.

⁵² UN Law of the Sea Convention of 10th of December of 1982, and in force from 16th of November of 1994.

pollution we shall apply in every sea area while the ships are sailing⁵³. Thus, according to the regulation of the UNCLOS we have the following legal framework:

Table 4: Jurisdiction zones according with UNCLOS

Zone	Jurisdiction according with UNCLOS	Articles of UNCLOS
Internal waters	Subject to the jurisdiction of the coastal State.	Articles 2 and 8
Territorial waters	Subject to the jurisdiction of the coastal State. Vessels passing through the territorial sea shall be subject to the legislation of the coastal State concerning the <i>numerus clausus</i> aspects of article 21 referring to innocent passage, such as the preservation of the environment (art. 21.1.f).	Articles 2 and 21
Contiguous zones	The coastal State has only the power to take the necessary measures to prevent and punish violations of its customs, fiscal, immigration or health laws and regulations.	Article 33
Exclusive Economic Zone	The coastal State has jurisdiction over the <i>numerus clausus</i> aspects of article 56 as the right of sovereignty for the exploitation of natural resources and its conservation (art. 56.1.a) and jurisdiction on protection and prevention of marine environment (art.56.1.b.iii)	Articles 55 and 56
High seas	Subject to the exclusive jurisdiction of the State of nationality of the flag flying the vessel	Article 92

⁵³ BIRNIE, *op cit.*, 386-387.

Furthermore, it is necessary to emphasize that UNCLOS introduces legislation about pollution and how to prevent it distributed throughout the legal text, such as article 43 relative to prevention, reduction and control of pollution in straits. Moreover, the entire Part XII of the Convention, article 192 to article 237, is dedicated to protection and prevention of maritime medium. Of all these precepts, we will highlight articles 212 and 222 as they focused on the prevention of air pollution. In this line, we must point out that the International Court of Justice (ICJ) reaffirms this idea of prevention in the *Gabcikovo-Nagymaros Case* when it exposes that

*“the Court is mindful that, in the field of environmental protection, vigilance and prevention are required on account of the often irreversible character of damage to the environment and of the limitations inherent in the very mechanism of reparation of this type of damage”*⁵⁴.

In the one hand, article 212.1 establishes that

“States shall adopt laws and regulation to prevent, reduce and control pollution of the marine environment from or through the atmosphere, applicable to the air space under their sovereignty and to the air space under their sovereignty and to vessels flying their flag or vessels or aircraft of their registry, taking into account internationally agreed rules, standards and recommended practices and produces and the safety air navigation”.

Also establishes that States must take other measures as they may be necessary to prevent, reduce and control such pollution (art. 212.2 and 3).

In the other hand, article 222 it is provided for the execution by States of the provisions of article 212⁵⁵. Furthermore, in relation with this consuetudinary law, ICJ

“also recognizes that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of

⁵⁴ ICJ, *Gabcikovo-Nagymaros Project* (Hungary/Slovakia), Judgment on 25 of September of 1994, *ICJ Reports*, p.140

⁵⁵ In order to implement this regulation, Annex VI of UNCLOS established in Hamburg the Tribunal of the Law of the Sea.

*other States or of areas beyond national control is now part of the corpus of international law relating to the environment*⁵⁶.

2. Geneva Convention on Long-Range Transboundary Air Pollution of 13 November 1979.

The Convention on Long-Range Transboundary Air Pollution was set up in Geneva on 13th November of 1979 and it establishes a framework for intergovernmental cooperation to protect health and the environment against air pollution that may affect several countries.

In this way, Geneva Convention sets up a generic content and principles to gradually reduce and prevent air pollution, including long-range air pollution and the commitment to protect the environment. This aim is regard in its article 2 as it establishes that

*“the Contracting Parties, taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution”*⁵⁷.

The cooperation that lays down in this agreement concerns to the development of appropriate policies, the exchange of information, the conduct of research activities and the implementation and development of a monitoring mechanisms. In fact, the signatories undertake to limit, prevent and gradually reduce emissions of air pollutants and thereby to combat the consequent transboundary pollution⁵⁸.

According to Geneva Convention articles 3 to 8, the parties States have an obligation to develop and exchange information, as well as to conduct research and consultations. Those consultations shall be held on request between, on the one hand, those contracting parties affected by long-range transboundary air pollution or exposed to a significant risk of such pollution. And, on the other hand, those States parties in whose territory and within whose jurisdiction a substantial contribution on transboundary atmospheric pollution at a great distance has occurred, or could have originated, by reason of the fact that activities are carried out in those territories. However, the Geneva

⁵⁶ ICJ, *Legality of the threat or use of nuclear weapons*, Advisory Opinion of 8 July 1996, *ICJ Reports* 1996, 1, p. 29.

⁵⁷ JUSTE, *op cit.*, p.266-288.

⁵⁸ BIRNIE, *op cit.*, 344-346.

Convention does not establish formal obligations, but rather generic commitments that do not entail specific obligations to reduce emissions of air pollutants, such as SO_x emissions⁵⁹.

Furthermore, Geneva agreement, with the need of creation a program for monitoring and evaluation of long distance transport of air pollutants set up the bases for the European Monitoring and Evaluation Program (EMEP) in its 9 article. This program, EMEP, was established in 1977 with the objective of be continuous monitoring the levels of sulfur dioxide and related substances, both in the air and in water, soil and vegetation.

There are 8 additional conventional instruments adopted by States party to the Geneva Convention, but we will study just those that affect to de dioxide sulfur regulation⁶⁰.

a. The Geneva Protocol of 28 September 1984.

Geneva Protocol is aimed at establishing a mechanism to finance the concerted monitoring and evaluation program for the long-range transport of air pollutants in Europe (EMEP). In fact, it is an instrument for the distribution of the costs derived from the Observation Program, which is the main pillar of the review and assessment of air pollution in Europe in relation to emission reduction agreements. EMEP has the following three components⁶¹.

- i. Data collection of SO_x and other contaminants such as nitrogen.
- ii. Measurement of atmospheric quality and rainfall
- iii. The modeling of atmospheric dispersion.

b. The Helsinki Protocol of 8 July 1985

The Helsinki Protocol is concerning to the reduction of emissions of sulfur dioxide or its transboundary flows. The parties of this Protocol undertake to reduce their annual emissions of sulfur dioxide or their transboundary flows by at least 30% by 1993, using the 1980 emission level as the basis for calculating the reductions. According to the Protocol, Parties should develop, without delay, national programs, policies and

⁵⁹ BORRAS, *op cit.*,96-97.

⁶⁰ The Protocols adopted after Geneva Convention were the Geneva Protocol of 1984, the Helsinki Protocol of 1985, the Protocol of Sofia of 1988, the two Aarhus Protocols of 1998, the Geneva Protocol of 1991 and the Oslo Protocol of 1994.

⁶¹ *Ibid*, p.98.

strategies to reduce sulfur dioxide emissions or their transboundary flows, within the percentages and deadlines set by the Protocol (art. 6). Moreover, States shall report annually to the Executive Body of the Geneva Convention their national emissions of SO_x as well as on the basis on which such emissions have been calculated. (art. 4)⁶². In this way, this Protocol is the first instrument that establishes the obligation to reduce SO_x emissions at the universal level.

c. The Oslo Protocol of 14 June 1994

The Oslo Protocol is aimed in the further reduction of sulfur dioxide emissions, as regulated by the Helsinki Protocol of 8 July 1985. In this way, each State Party undertakes to reduce and control its emissions of SO_x according to its capacity and in accordance with the maximum levels of individual emission that the Protocol fixes especially for each part and which varies between 30 and 87%, taking as reference the level of emissions of 1980. Likewise, the parties should inform the executive body of the Geneva Convention about the compliance with the obligations assumed under the Protocol. To this end, the protocol creates a special committee to monitor its implementation⁶³.

d. The Gothenburg Protocol from 30 of November of 1999.

The Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone was adopted with the aim of setting national emission ceilings for 2010 up to 2020 for four pollutants: sulfur, nitrogen oxides, volatile organic compounds and ammonia. Of course, we will focus in those regulation related with sulfur.

The Protocol is built on the previous Protocols that addressed sulfur emissions (Protocol of 1985 and Protocol of 1994) and established new limits and obligations. According to the Gothenburg Protocol, parties States have to report on their emissions once a year. In addition, the Protocol requires Parties to provide projections of their future emissions and it can also help countries in managing air pollution by adjusting measures in case of projected exceedances⁶⁴.

⁶² JUSTE, *op cit.*, p.271-272.

⁶³ BORRÀS, *op cit.*, p.99.

⁶⁴ *Ibid.*, p.103-105

Furthermore, this Protocol introduced flexibilities to facilitate accession of new States, mainly countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia. Another novelty of the revised Protocol is a flexibility mechanism that allows Parties – under clearly defined circumstances – to propose adjustments to their emission inventories or emission reduction commitments listed in Annex II of the Protocol⁶⁵.

3. International Convention for the Prevention of Pollution from Ships (MARPOL) with special attention to sulfur regulation.

MARPOL is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. This Convention was adopted on 2 November of 1973 by IMO and entered into force on 2 October 1983 as a combined instrument that has been updated by amendments through the years. This agreement is one of the most important in our research as it regulates specifically the sulfur dioxide emissions from ships at universal level.

The Convention currently consists in 6 technical Annexes that regulate the different types of pollution from ships: Annex I related to the prevention of Pollution by Oil; Annex II for the control of pollution by noxious liquid substances in bulk; Annex III for the prevention of pollution by harmful substances carried by sea in packaged form; Annex IV for prevention of pollution by sewage from ships; Annex V about prevention of pollution by garbage from ships; and Annex VI for prevention of air pollution from ships. In order to focus our investigation we will concentrate in Annex VI as it regulates the sulfur emissions from vessels.

Annex VI about the prevention of air pollution from ships was adopted in 1997 and entered into force on 19 May 2005. It is important to highlight that although air contamination from vessels is one of the most damaging pollutions of ships, this was the last Annex adopted, just twelve years ago. This is a clue that makes us see that the legislator has shelved until unfortunately the damage has caused a terrified harm at the international level to establish some regulation in this field⁶⁶.

The structure of Annex VI from MARPOL contains 19 rules divided into three chapters, and five appendices. We will concentrate in those rules that regulate the SOx.

⁶⁵ BIRNIE, *op cit.*, p.346-349.

⁶⁶ *Ibid.*, p.403-405.

According to rule 1 of Annex VI its provisions are apply to all the ships; however, the same MARPOL provides for exceptions. In this way, it is only apply to all ships of 400 gross tons and above, which have to carry an International Air Pollution Prevention Certificate (IAPPC). This certificate must be on board at delivery for a ship constructed after 19 May 2005. For ships constructed before this date, the IAPPC must be on board at the first scheduled dry-docking after 19 May 2005, but not later than 19 May 2008. Ships of less than 400 tons only have to comply with the flag pavilion regulation; it means that in their case the administration of pavilion may establish appropriate measures in order to ensure that Annex VI is complied with⁶⁷.

According with the regulation 2.9 of Annex VI, sulfur dioxide emission controls are applied to all fuel oil, combustion equipment and devices on board. Therefore includes all the main auxiliary engines together with items such boilers and inert gas generators.

These controls are divided between those applicable inside Emission Control Areas (ECAs) established to limit the emission of SO_x and outside such areas, which are primarily achieved by limiting the maximum sulfur content of the fuel oils as loaded, bunkered, and subsequently used on board.

Sulfur emissions from ships exhausts were estimated at 4.5 to 6.5 million tons per year, about % percent of total global sulfur. These emissions over open seas are spread out and its effects are moderate, but on certain routes the emissions create environmental problems, especially in English Channel, South China Sea and Strait of Malacca. That's the reason why Annex VI of MARPOL sets up a limitation of the sulfur content of ship's fuel⁶⁸.

These fuel oil sulfur limits (expressed in terms of % m/m, that is by mass) regulated in articles 14.1 and 14.4 Annex VI MARPOL, have been modified among years⁶⁹. They are reflected in the follow Table 5.

⁶⁷ *Ibid.*, 404-409.

⁶⁸ JUSTE, *op cit.*, 141-145.

⁶⁹ IMO, *Sulphur oxides (SO_x) – Regulation 14*,
<[http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-\(SOx\)-%E2%80%93-Regulation-14.aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-(SOx)-%E2%80%93-Regulation-14.aspx)> [02/02/2017]

Table 5: Limit of SO_x outside and inside ECAs

Outside an ECAs established to limit SO _x and particulate matter emissions	Inside an ECAs established to limit SO _x and particulate matter emissions
4,5% m/m prior to 1 January 2012	1,5% m/m prior to 1 July 2010
3,5% m/m on and after 1 January 2012	1,0% m/m on and after 1 July 2010
0,5% m/m on and after 1 January 2020 ⁷⁰	0,1% m/m on and after 1 January 2015

The ECAs areas are:

- i. Baltic Sea area, as defined in Annex I of MARPOL (SO_x only);
- ii. North Sea area, as defined in Annex V of MARPOL (SO_x only);
- iii. North American area, as defined in Appendix VII of Annex VI of MARPOL (SO_x, NO_x and PM); and
- iv. United States Caribbean Sea area, as defined in Appendix VII of Annex VI of MARPOL (SO_x, NO_x and PM).

In the following world map from IMO we can see with more detail the ECA zones:



As we can see, although big shipping routes are polluting around the world, the ECAs are concentrated in Europe and North America zones. In this way, we can appreciate a big difference between developed and non-developed countries. This situation involves that the Indian Ocean is one of the most polluted in the world, in this line, neighbors States are suffering the consequences against the human development principle.

⁷⁰ Depending on the outcome of a review, to be concluded by 2018, as to the availability of the required fuel oil, this date could be deferred to 1 January 2025. MEPC 70 (October 2016) considered an assessment of fuel oil availability to inform the decision to be taken by the Parties to MARPOL Annex VI, and decided that the fuel oil standard (0.50% m/m) shall become effective on 1 January 2020 (resolution MEPC.280).

Moreover, ships which operate both outside and inside these ECAs will therefore operate on different fuel oils in order to comply with the respective limits. In such cases, prior to entry into the ECAs, it is required to have fully changed-over to using the ECAs compliant fuel oil and to have on board implemented written procedures as how this is have to be undertaken (regulation 14.6). Similarly change-over from using the ECAs compliant fuel oil is not to commence until after exiting the ECAs. At each change-over it is required that the quantities of the ECAs compliant fuel oils on board are recorded, together with the date, time and position of the ship when either completing the change-over prior to entry or commencing change-over after exit from such areas.

These records are to be made in a logbook as prescribed by the ship's flag State. In the absence of any specific requirement in this regard the record could be made, for example, in the ship's Annex I Oil Record Book.

The first level of control in this respect is on the actual sulfur content of the fuel oils as bunkered. This value is to be stated by the fuel oil supplier on the bunker delivery note and hence, this together with other related aspects, is directly linked to the fuel oil quality requirements as covered under regulation 18⁷¹.

Consequently, regulation 14 provides both the limit values and the means to comply. However, there are other means which equivalent levels of SO_x and particulate matter emission control, both outside and inside ECAs, could be achieved. These may be divided into methods termed primary (in which the formation of the pollutant is avoided) or secondary (in which the pollutant is formed but subsequently removed to some degree prior to discharge of the exhaust gas stream to the atmosphere). Regulation 4.1 allows for the application of such methods subject to approval by the Administration⁷².

After having seen the binding regulation on the SO_x pollution, we will proceed to analyze the soft law about this issue. It should be noted that this soft law is important as it is the basis for the regulation we have analyzes.

⁷¹ SPALDING, M., *et al.*, "Protecting marine spaces: global targets and changing approaches", *Ocean Yearbook Online*, 27(1), 2013, p. 213-248.

⁷² SCHINAS, *et al.*, "Selecting technologies towards compliance with MARPOL Annex VI: The perspective of operators", *Transportation Research*, 2014, p. 28-40.

C. Soft law regulation

We are moving in the area of environmental law and its eminently functional nature contributes to give its rules a flexible content, configuring a particularly fluid legal universe. Thus, the instruments that appear in this soft law regulation do not themselves have binding legal force. These flexible operational techniques are characterized by the performance of international organizations and in the context we are working we must highlight the IMO.

1. Declaration of the United Nations on the human environment (Stockholm Declaration of 1972).

The Stockholm Conference from 5 to 16 June of 1972 was the first important step at the international level to raising awareness of environmental problems, including in the instruments adopted dispositions for protect the environment from air pollution.

In this Conference three instruments with recommended character were adopted: the Stockholm Declaration, the Action Plan for the Environment, and the UNEP. For our issue we will concentrate in Stockholm Declaration as is the one that contributes to the future and specific regulation of our item. The Stockholm Declaration from 1972 set up 26 principles about environment, but we will concentrate in those that are relevant for the air pollution from SO_x⁷³.

In this way, the principles 1, 2 and 4 postulates a corresponding instrumentalist approach to the environment and also reflects an anthropocentric perspective on respecting nature. For example, principle 1 introduces for first time the “*human right to the environment*”. The Declaration does indeed refer to a human’s “*fundamental right to [...] adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being*”. However, at the Conference, various proposals for a direct and specific reference to an environmental human right were rejected.

In the principles 6 and 7, it is formulate the obligation to end the emissions of toxic substances that damage environment and that it cannot afford and also the duty to

⁷³ See SHON, L., “The Stockholm Declaration on the Human Environment”, *Harvard International Law Journal*, 14(3), 1973, p. 423.

prevent pollution of the seas. In this way, we can interpret that these principles can be applied for the pollution of dioxide of sulfur.

However, another significant provision is principle 21 which establishes the State's obligation to ensure that activities developed inside its jurisdiction or under its control do not cause damage to the environment of other States or to areas beyond national jurisdiction. In this way refers the ICJ when it affirms that "*the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory*"⁷⁴.

The base for the international cooperation in aim to protect the environment is set up in principles 22 and 24 of the Declaration, where principle 24 establishes "*all countries should be engaged in [...] the protection and improvement of the human environment*" and principle 22 prescribes that "*States shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage*"⁷⁵.

Thus, the Stockholm Declaration we establishes the base to adopt binding regulation, as for example, the Geneva Convention on Long-Range Transboundary Air Pollution of 1979.

2. Declaration of the United Nation on environment and development (Rio Declaration of 1992).

The Rio Conference on Environment and Development or Earth Summit was set up from 1 to 15 June 1992 and among other instruments it was adopted de Rio Declaration on environment and development that contains 27 principles for the achievement of sustainable development.

The Rio Declaration is an instrument of soft law more clear than Stockholm, among other reasons, since at the time of stipulate the human right to an adequate environment in its principle 1 establishes that human beings "*are entitled to a healthy and productive life in harmony with nature*"⁷⁶. Thus, in this principle, as well as in principles 3 and 4

⁷⁴ ICJ, *Case concerning Pulp Mills on the River Uruguay* (Argentina v. Uruguay), judgment of 20 April of de 2010, *ICJ Reports 2010*, para. 101.

⁷⁵ STEPHENS, T., "International courts and sustainable development", *Environmental Discourses in Legal Institutions*, 2012, p. 64-89.

⁷⁶ SAND, P., *et al.*, *Principles of International Environmental Law*, Cambridge, 2012, p. 34-39.

we can see how Rio Declaration establishes the obligation to protect the environment for present and future generations (principle 3), and the protection of environment should integrate any process of development (principle 4). In this way, we must protect the human right of environment from the pollution and the damage of sulfur dioxide but also our right to life and health⁷⁷.

Also principle 2 establishes the responsibility of States to protect the environment, and which is enforced in principle 10 that includes the responsibility for the citizens, not only for States as it is stipulated in principle 21 of Stockholm⁷⁸.

In environmental law the cooperation between States is the base to achieve the objectives. In this way, principle 12 establishes that “*States should co-operate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation*”. The principle 14 encourage this idea of cooperation as it sets up that “*States should effectively co-operate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health*”.

Furthermore, is important to highlight that Rio Declaration introduces the polluter pays principle (principle 16), and principle 19 introduces the responsibility to inform the affected States on activities that may have a significant adverse transboundary environmental effect, which constitutes the base for the Geneva Convention on Long-Range Transboundary Air Pollution of 1979⁷⁹.

It is important to stands out that the construction “*shall*”, used to express that the action of the main verb must be carried out, is practiced in sixteen of the twenty seven principles. From this language used in Rio Declarations we can interpreted that this *soft law* instrument is focused to get obligations of results. Thus, it is clear that Rio regulation is more accurate than Stockholm⁸⁰.

⁷⁷ *Ibid.*, p. 453-454.

⁷⁸ LÁZARO, T., *Derecho internacional del medio ambiente*, Atelier, 2005, p.279-281.

⁷⁹ SANDS, *op cit.*, p. 288-289.

⁸⁰ DE SADELEER, N., *Environmental Principles: From Political Slogans to Legal Rules*, OUP, 2002, p.159-163.

3. Guidelines of Marine Environmental International Protection Committee (MEPC) from the International Maritime Organization.

The work of the MEPC is to encourage the development of measures to protect the marine environment and to conserve natural resources. In so doing, the role of MEPC is to examine IMO's collaboration with other intergovernmental organizations and UN bodies, as well as with the secretariats of some multilateral environmental agreements, such as MARPOL. The guidelines developed by the MEPC have made an essential and valuable contribution to the progressive development of international environmental law, as well as to the law of the sea. In this way, we will highlight that MEPC initiated the discussion related to the prevention of air pollution from ships in its sessions of 1997 and the results were finally included in Annex VI of MARPOL⁸¹.

Moreover, in 2015, a recent guideline was adopted in aim to reduce the SOx emissions from ships: the Exhaust Gas Cleaning Systems (EGCS) guideline⁸². The purpose of this guideline is to specify the requirements for the testing, survey certification and verification of EGCS under regulation 14 of Annex VI of MARPOL to ensure that they provide effective equivalence to the requirements of regulations 14.1 and 14.4 of Annex VI MARPOL that we have seen *supra*.

According to this, ships can accomplish the new requirements of MARPOL by using low sulfur fuel oil such as Marine Gas Oil, sometimes called distillates. The use of EGCS must be approved by the ship's Administration, it means the flag State, that is an State party to Annex VI MARPOL⁸³.

This guideline has been taking in account in the development by IMO of the International Code for Ships using Gases and other Low Flashpoint Fuels (IGF Code), which has been adopted in 2015.

⁸¹ *Ibid.*, 385-386.

⁸² MEPC, *Guidelines for exhaust gas cleaning Systems resolution of 2015*, MEPC.259(68), 15 May 2015.

⁸³ CORBETT, J., *et al.*, "Emissions from ships", *Science*, 278, 2007, p. 823-824.

In this line, according with the 70th Session of October 2012, we shall point out the MEPC role as one of the main impellers of the decision of reducing the SO_x content in the fuel oil to the standard of 0.50% m/m by 1 January 2020.

In this point of the research we have seen the regulation of SO_x at the universal level, both binding normative and soft law. Now, we will see how the EU has deal with the sulfur pollution emitted by ships.

IV. EUROPEAN UNION REGULATION OF SULFUR POLLUTION

A. Evolution of the legal framework of EU in environmental matter with special reference to sulfur pollution.

The origins of the EU started with the European Coal and Steel Community treaty of Paris in 1951, the European Atomic Energy Community and the treaty on European Economic Community, both of 1957, but it was not until February of 1985, with the treaty of the European Union Act that the Economic European Community started to be competence in the environmental matter. Nowadays, the EU has an important role in the environmental regulation and its framework is set in the Treaty of European Union (TEU) of 1993 (Maastricht treaty)⁸⁴ and the Treaty on the Functioning of the EU (TFEU) of 2007 (Lisboan treaty)⁸⁵.

The base of the EU is the TEU and the TFEU, and both treaties establish the legal EU framework of the environmental regulation, and in consequence, they permit the regulation about SO_x pollution at the EU level.

In the one hand, we must point out article 3.3 of the TEU as it regards that the EU “*shall work for [...] a high level of protection and improvement of the quality of the environment*”. This aim of protection of the environment is also collected in the Preamble of the treaty. The pursue of this common polices should be done with the cooperation between the members States according with article 21. 2.d of TEU .

In the other hand, it is important to highlight that the TFEU is more detailed at the time to establish the base from the future regulation at the EU level. This treaty sets up that the environment competence is shared between the EU and the Member States (art.4.2.e and 153 TFEU) and establishes the obligation to integrated environmental protection requirements into the EU polices (art. 11 TFEU). According to article 114.4 and 5 of TFEU, Members States could maintains national provisions relating to the protection of environment when there are a major need regarded in article 36 of the treaty (114.4) and “*when deems it necessary to introduce national provisions based on new scientific evidence relating to the protection of the environment or the working environment on grounds of a problem specific to that Member State*”(114.5). In those situations the Member States shall notify the Commission of these provisions as well as the grounds

⁸⁴ TEU of 1993, *OJ C 326*, 26.10.2012, p. 13–390.

⁸⁵ TFEU of 2007, *OJ C 326*, 26.10.2012, p. 47–390.

for maintaining them. Moreover, the Lisbon Treaty sets up in its article 117.2 a Cohesion Fund to provide a financial contribution to projects in the field of environment.

Furthermore, the title XX of the TFEU (arts. 191 to 193) is dedicated exclusively to the environment. In its article 191.1 is regarding the objective of the EU environment policy which includes the preserving, protecting and improving the quality of the environment, and the prudent and rational utilisation of natural resources.

According to article 191.3 TFEU the policies of EU must taking in account this aspects:

- i. available scientific and technical data,
- ii. environmental conditions in the various regions of the Union,
- iii. the potential benefits and costs of action or lack of action,
- iv. the economic and social development of the Union as a whole and the balanced development of its regions.

This environmental actions at the EU level “*shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay*” (art.191.2). Those policies are taken by the European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee and the Committee of the Regions (art.192.1 TFEU).

EU has done the first important step to regulate sulfur content in liquid fuels to reduce its emissions in the atmosphere in 1975 with Directive 1975/716/EEC on the approximation of the laws of the Member States relating to the sulfur content of certain liquid fuels⁸⁶. This Directive, although exclude the application of the limits for the shipping industry it is important in order to highlight the problem of SOx pollution in EU and to cope with it.

In 1993, the Directive 1993/12/EEC relating to the sulfur content of certain liquid fuels⁸⁷ was the first mandatory EU regulation that established limitations for sulfur in

⁸⁶ Council Directive 75/716/EEC of 24 November 1975 on the approximation of the laws of the Member States relating to the sulfur content of certain liquid fuels, *OJ L 307*, 27.11.1975, p. 22–24.

⁸⁷ Council Directive 93/12/EEC of 23 March 1993 relating to the sulphur content of certain liquid fuels, *OJ L 74*, 27.3.1993, p. 81–83.

the shipping industry, but with limitations as it does not regulate all kinds of fuel. It was amended by Directive 1993/32/EC⁸⁸. In fact, this regulation is pioneer also in the international level, and consequently, IMO inspires his regulation in the avant-garde regulation from EU. As an example, Annex VI from MARPOL relating to air pollution was adopted in 1997, it means 4 years later of the EU Directive.

In the following years it has been deemed significant to lay down limits for the sulfur content of other liquid fuels, in particular heavy fuel oils, marine fuels, marine gas oils and gas oils, on the basis of cost effectiveness studies and also in view of the regulation in Annex VI on sulfur content of marine fuel in MARPOL.

Following the entry into force of MARPOL Annex VI in May 2005 a new Directive, 2005/33/EC⁸⁹, was promulgated in July 2005, amending Directive 1999/32/EC. The measures in this Directive meant to complement Member States national measures to comply with emission ceilings for atmospheric pollutants. The currently situation of EU, on marine fuels through the Directive 2012/33/EU⁹⁰, further amending Directive 1999/32/EC as regards the sulfur content of marine fuels. Moreover, to control those limitations EU created the European Maritime Safety Agency (EMSA) by the Regulation 1406/2002⁹¹.

Furthermore, we shall take in account the Directive 2008/50/EC on ambient air quality and cleaner air for Europe as the air framework Directive⁹² which includes the sulfur pollution from ships.

However, we must refer to Directive 2008/56 EC establishing a framework for community action in the field of marine environmental policy as a marine strategy

⁸⁸ Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC, *OJ L 121*, 11.5.1999, p.13–18.

⁸⁹ Directive 2005/33/EC of the European Parliament and of the Council amending Directive 1999/32/EC relating to a reduction in the sulphur content of certain liquid fuels, *OJ L 191*, 22.7.2005, p.59–69.

⁹⁰ Directive 2012/33/EU of the European Parliament and of the Council of 21 November 2012 amending Council Directive 1999/32/EC as regards the sulphur content of marine fuels, *OJ L 327*, 27.11.2012, p.1–13.

⁹¹ Regulation 1406/2002 of the European Parliament and of the Council of 27 June 2002 establishing a European Maritime Safety Agency, *OJ L 307*, 27.11.1975, p.34–56.

⁹² Directive 2008/50/EC of the European Parliament and the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, *OJ L 152*, 11.6.2008, p.1–44.

framework Directive⁹³, but as this marine Directive do not regard the SOx pollution from ships, we will not analyzes it.

B. European Union regulation relating to sulfur pollution.

1. Directive 2008/50/EC on ambient air quality and cleaner air for Europe as the air framework Directive.

In it whereas 17 of the Directive establishes that “*The necessary Community measures to reduce emissions at source,[...] and to address the sulphur content of fuels including marine fuels should be duly examined as a priority by all institutions involved*”.

In this way, it is important to highlight that this Directives sets up in its Chapter II Section I, articles 5 to 8, the assessment of ambient air quality in relation to sulfur dioxide, but also, nitrogen dioxide and oxides of nitrogen, particulate matter, lead, benzene and carbon monoxide.

According with article 6 of this Directive “*Member States shall assess ambient air quality with respect to the pollutants referred to in Article 5 [which includes SOx pollutant] in all their zones and agglomerations*”. These zones are defined by the same article 6 but also to the Annex III of the Directive. As an example, article 6.2 sets up that “*In all zones and agglomerations where the level of pollutants referred to in paragraph 1 exceeds the upper assessment threshold established for those pollutants, fixed measurements shall be used to assess the ambient air quality*”.

The location of sampling points for the measurement of sulfur dioxide in ambient air shall be determined using the criteria listed in Annex III which is divided in two points: the protection of human health sampling points and the protection of vegetation and natural ecosystems points (article 7).

Furthermore, the Directive, according with article 8, establishes the measurement methods and the criteria specified that Member States shall apply in relation with Section A of Annex VI of the Directive⁹⁴.

⁹³ Directive 2008/56/EC of the European Parliament and the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, *OJ L 164*, 25.6.2008, p.19–40.

Moreover, the Directive establishes the obligation of public information (article 26) and the free transmission and reporting of this information (article 27). For the non-compliance of this provisions, the Directive regards that “*Member States shall lay down the rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented*” (article 30).

After see this framework Directive we will focus on the specific regulation to deal with the SO_x pollution at the EU level.

2. Directive 1999/32/EC as the first regulation to cope with sulfur pollution with ships.

As we have seen, the Directive 1999/32/EC of 26 April of 1999 was the first regulation at the European Union level related to the sulfur dioxide with application to the ship industry. According to article 1 “*the purpose of this Directive is to reduce the emissions of sulphur dioxide resulting from the combustion of certain types of liquid fuels and thereby to reduce the harmful effects of such emissions on man and the environment*”. To archive the aim of reduce the sulfur emissions the Directive impose limits on the sulfur content of such fuels as a condition for their use within the territory of the Member States.

However, we are investigating the sulfur emissions from ships and in this way we must remark that in the same article 1.2.a establish that the limits to reduce emissions shall not apply to petroleum derived liquid fuels used by seagoing ships and the marine gas oil used by ships crossing a frontier between a third country and a Member State. Nevertheless, the regulation of the Directive 1999/32 not excludes the use of fuel of all ships, as in its article 1 includes the exception of the following fuels:

- i. Those which have a viscosity or density falling within the ranges of viscosity or density defined for marine distillates in Table I of ISO 8217 (1996)

⁹⁴ The reference method for the measurement of sulfur dioxide is that described in EN 14212:2005 ‘Ambient air quality; Standard method for the measurement of the concentration of sulphur dioxide by ultraviolet fluorescence’.

- ii. Any petroleum derived liquid fuel falling within CN code 2710 00 67 or 2710 00 68⁹⁵
- iii. Any petroleum-derived liquid fuel which, by reason of its distillation limits, falls within the category of middle distillates intended for use as fuel and of which at least 85 % by volume (including losses) distils at 350 °C by the ASTM D86 method⁹⁶.

As we can see, the target of the Directive is reducing a certain type of fuel of ships. We are interested in the limits to de heavy fuel oil, which is use in ships and well known as *bunker fuel*, and gas oil.

In the one hand, to reduce the emission of sulfur, the Directive establish a maximum limit of sulfur content of heavy fuel oil that from 1 January 2003 must be 1,00 % by mass. Nevertheless a Member State may authorize heavy fuels oils with a sulfur content exceeded, between 1, 00 and 3,00% by mass, provided with the air quality standards. In this case, the Member State shall, at least 12 months beforehand, inform to the Commission and the public that will apply the limit of sulfur between 1,00 and 3,00%. Moreover, this Directive includes reservations for Greece throughout its territory, for Spain with regard to the Canary Islands, for France with regard to the French Overseas Departments, and for Portugal with regard to the archipelagos of Madeira and Azores. These reservations were in because it was difficult to apply the Directive in this regions, duo to present technical and economic problem. Probably, in the specific case of Greece, we could attribute of the reservation to the pressure of the shipping industry to not adopt environmental regulation.

In the other hand, the maximum limit of sulfur content in gas oil, including de marine gas oils we have seen, is 0,20% by mass from July of 2000 and 0,10% by mass for January of 2008. As in the *bunker fuel* case, Member States can apply the air quality standards for sulfur dioxide of Directive 80/799/EEC but the content of sulfur shall be between 0,10% and 0,20%.

⁹⁵ See article 2.2 of Directive 1999/32/EC.

⁹⁶ Diesel fuels as defined in Article 2(2) of Directive 98/ 70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/ 12/EEC (2) are excluded from this definition. Fuels used in non-road mobile machinery and agricultural tractors are also excluded from this definition;

According to article 6 of the Directive, Member States shall take all necessary measures to check by sampling that the sulfur content of fuels. This control should be done by sampling and analysis⁹⁷.

After that, Member States have the obligation of by 30 June of each year to supply the Commission with a short report on the sulfur content of the liquid fuels falling within the scope of this Directive and used within their territory during the preceding calendar year.

For non-compliance with the regulation, the Directive 1999/32/EC establishes a non-self-executing clause for penalties which refers competence to Member States to adopt measures that they consider effective.

a. Directive 2005/33/EC of sulfur emissions control areas (SECAs).

Directive 2005/33/EC amending Directive 1999/32/EC to incorporate the sulfur provisions of the Annex VI of MARPOL, as it regards the sulfur content of marine fuels at the universal level.

The Directive contains some additional fuel-specific requirements for ships calling at EU ports. These obligations are related to the use of fuels covered by the Directive, and the placing on the market of certain fuels (*e.g.* marine gas oils).

Additionally, it introduces a 0,1% maximum sulfur requirement for fuels used by ships at berth in EU ports from 1st January 2010. This Directive had the need to be reviewed with the goal to align it with the 2008 MARPOL amendment.

b. Directive 2012/33/EU as regards the sulfur content of marine fuels.

The Directive 2012/33/EC amending Directive 1999/32/EC as regards the sulfur content of marine fuels establish the exclusion of marine gas oil from the sulfur content limit set up for gas oil, and it eliminates the reservation for Greece and the other zones for gas oil.

⁹⁷ The reference method adopted for determining the sulfur content shall be that defined by ISO method 8754 (1992) and PrEN ISO 14596 for heavy fuel oil and marine gas oil and for the EN method 24260 (1987), ISO 8754 (1992) and PrEN ISO 14596 for gas oil.

In the one way, it set up the 1,5% limit for marine fuels used in SECAs and by passenger ships operating on regular services to or from EU ports in Member States territorial seas, exclusive economic zones and pollution control zones (ECAs). The application dates were: 11th August 2006 for the Baltic Sea, 11th August 2007 for the North Sea (including English Channel), and 12 months after entry into force for any other SECA, including ports, designated by the IMO⁹⁸.

Furthermore, it establishes a 0,1% limit for marine fuels used by inland waterway vessels and by ships at berth in EU ports from 1st January 2010. Those limits have exceptions, since they are not applying in the following supposes:

- i. whenever, according to published timetables, ships are due to be at berth for less than two hours,
- ii. to inland waterway vessels that carry a certificate proving conformity with the International Convention for the Safety of Life at Sea, (1974, as amended) while those vessels are at sea,
- iii. until 1st January 2012 for the vessels listed in the Directive's Annex and operating exclusively within the territory of the Hellenic Republic, and
- iv. to ships which switch off all engines and use shore-side electricity while at berth in ports.

In the other way, the limit of sulfur content for heavy fuel oil remains 1,0% since 1st January 2003.

It is important to remark that in this Directive all the maritime fuels are regulated according to article 3 *bis*. In this case, the limits are different, as its prescribes, "*Member States shall ensure that marine fuels are not used within their territory if their sulphur content exceeds 3,50 % by mass, except for fuels supplied to ships using emission abatement methods subject to Article 4c operating in closed mode*".

In the following Table 6 we can see the different limits of sulfur that have been established for the different zones at the EU level.

⁹⁸ See KLIMONT, Z., *et. al.*, "The last decade of global anthropogenic sulfur dioxide: 2000–2011 emissions", *Environmental Research Letters*, 8 (1), 2013, 14003.

Table 6: Summary of the evolution of SOx limitatins.

	2011	2012	2015	2020
Ships at berth	0,1%	0,1%	0,1%	0,1%
Inland waterways	0,1%	0,1%	0,1%	0,1%
Outside SECAs	4,5%	3,5%	3,5%	0,5%
Inside SECAs	1%	1%	0,1%	0,1%
Ro-Pax ⁹⁹	1,5%	1,5%	1,5%	0,5%

3. Monitoring systems of pollution at the EU level: European Maritime Safety Agency (EMSA).

EMSA was established by the Regulation 1406/2002 of the European Parliament and of the Council of 27 June 2002. EMSA it's important in our research in order that it works to prevent and respond to pollution caused by ships. As it picks up in its article 1 the purpose of this Agency is *“ensuring a high, uniform and effective level of maritime safety, maritime security, prevention of, and response to, pollution caused by ships as well as response to marine pollution caused by oil and gas installations”*.

EMSA functions are regulated in its articles 2 and 3, which basically consist in provides technical assistance and support to the European Commission and EU countries in regard to the development, application and evaluation of EU law on maritime safety, security and pollution. In this way, EMSA is an important agent to monitor the application of the regulation about sulfur dioxide. Its objective consists basically in core tasks, like the assistance in the preparatory work for updating and developing relevant EU laws or supporting pollution response actions in cases of pollution caused by ships and oil and gas installations. The Agency is also responsible for doing support tasks, but only assumes these work if they create substantial added value and avoid duplication of effort and do not infringe on EU countries rights and obligations¹⁰⁰.

⁹⁹ Those vessels that are designed to carry wheeled cargo, such as cars, trucks, semi-trailer trucks, trailers, and railroad cars, that are driven on and off the ship on their own wheels or using a platform vehicle, such as a self-propelled modular transporter.

¹⁰⁰ JUSTE, *op cit.*, p.172-174.

For last, the article 3 of the Regulation establishes EMSA tasks related to the visits and inspections of the Member States. This function consist in assist the Commission and national administrations to check the effective implementation of EU rules and ensure a high and uniform level of safety. The Agency carries out inspections to classification societies, as well as in non-EU countries regarding the training and certification of seafarers¹⁰¹.

All the tasks of EMSA are made under the principles of transparency and protection of the information as it is established in article 4 of the Regulation.

C. Relationship between EU regulation and MARPOL.

In line with Annex VI MARPOL, the limits for the sulfur content of marine fuels used in designated SECAs were 1% until 31st December 2014 and 0,1% as from 1st January 2015. The IMO standard of 0,5% for sulfur limits outside SECAs will be mandatory in EU waters by 2020. Moreover, this will be valid for passenger ships operating outside SECAs which the current regime of 1,5% that applies also until 2020.

However, the regulation from EU establishes lower limits of sulfur in fuel than MARPOL; in fact, IMO regulations are inspired in the EU rules. To see clearly the relationship between both regulations we will analyze the CJEU *Manzi Case* of 2014¹⁰².

The EU Directive 1999/32/EC amended by Directive 2012/33/EU established that

“Member States shall take all necessary measures to ensure that, from [11 August 2006], passenger ships on scheduled services to or from any Community port do not use in their territorial waters exclusive economic zones and areas Pollution control for marine use with a sulfur content exceeding 1.5% by mass. Member States shall be responsible for enforcing this requirement, at least in respect of ships flying their flag and vessels of any flag while they remain in their ports” (art.4.a Annex VI).

The problem is that Annex VI MARPOL contains in particular rule 14, which provides that the sulfur content of all fuel oils used on board vessels shall not exceed 4,5% mass. In this way, a Non- Member State can accomplish MARPOL but break the EU precepts. In the *Manzi Case* as a preliminary ruling from the *Tribunal di Genova* in Italy

¹⁰¹ *Ibid.*, p.179.

¹⁰² CJEU, Judgment of 23 January 2014, *Manzi and Compagnia Naviera Orchestra Case*, C- 537/11.

concerning the interpretation of articles 2.3, 8 and 4a of Directive 1999/32/EU on the reduction of certain liquid fuels. The dispute proceedings between the Captain of a cruise ship and the company owner (*Compagnia Naviera Orchestra*) with the Commander of the port of Genoa, about an Administrative sanction burden imposed on them for failure to comply with the maximum sulfur content of marine fuels.

One of the referring Court questions was about the impact of MARPOL Annex VI to the scope of Article 4a of Directive 1999/32 in relation to the principle of general international law which requires that international agreements be implemented and interpreted in good faith. The CJEU opposes the interpretation of EU law in the light of MARPOL, which does not include some of the EU Member States. Thus, the problem is focused in that while Annex VI contains in particular rule 14.1 that ships shall not exceed 4,5% m/m fuel oil used on board, article 4a of Directive 1999/32 provides that the sulfur content of marine fuels must not exceed 1,5% m/m. Neither article 4a nor any other provision of that Directive refers to Annex VI as regards the maximum sulfur content.

In this judgment CJEU was declared itself incompetent to judge the case because not all the Member States are part of MARPOL. However, even assuming that case, the Court could interpret article 4a of Directive 1999/32 in the light of the sulfur content provided for in Annex VI MARPOL, and note that, the objective pursued by that Annex VI is the protection of the atmosphere by reducing the harmful emissions produced by maritime transport. In this line, Annex VI provision does not appear to be incompatible with the Directive objective, since it sets a maximum limit on the sulfur content of fuels for marine use less than that provided for in such Annex¹⁰³.

In the same line, we must point out the judgment of the CJEU of 3 June 2008 (*Intertanko Case*)¹⁰⁴ which issue in dispute is whether articles 4 and 5 of Directive 2005/35/EC¹⁰⁵ and MARPOL. Although this case do not has relevant for SOx emissions, it is important to highlight in order to see how the EU regulations act in front of MARPOL. In this case the Directive 2005/35 EC provides for a stricter standard of

¹⁰³ See PERNAS, J., “Sentencia del Tribunal de Justicia (Sala Cuarta) de 23 enero de 2014, asunto C-537/11, Mattia Manzi y Compagnia Naviera Orchestra contra Capitaneria di Porto di Genova”. *Actualidad Jurídica Ambiental*, 2014, p. 762-764.

¹⁰⁴ CJEU, Judgment of 3 June 2008, *Intertanko and Others case*, C-308/06.

¹⁰⁵ Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringement, *OJ L 255*, 30.9.2005, p. 11–21.

liability than does MARPOL, like in the *Manzi Case*. Under this Directive, serious negligence in particular is sufficient for a breach, whereas MARPOL provides for at least recklessness and knowledge that damage will probably result. In this case, its examination would run counter that not all the Member States are bound under MARPOL obligations, as in *Manzi Case*.

According to this, the EC can in principle, require the Member States to take measures which realize to their obligations under international law. This is already pointed out by article 307 European Community Treaty, which governs inconsistencies between pre-existing international agreements and Community law. Even if the Member States obligations under pre-existing agreements are initially unaffected by conflicts with EC law, nevertheless the Member States must take all appropriate measures to put an end to such conflicts; this may even require the denunciation of international agreements.

In this way, Member States cannot invoke agreements concluded after accession as against EC law. For this reason, it is considered that extensive binding effects on the EC cannot arise from agreements of the Member States which the EC has not ratified. Therefore, the implementation objective of Directive 2005/35 also does not mean that MARPOL can be used as a criterion for determining the legality of that Directive.

In fact, there is not an obvious conclusion about the relation of MARPOL with the EU regulation. Moreover, the CJEU do not express a clear opinion about it. This situation, can be attributed to the pressure of the lobbies of the shipping industry that press to do not apply strictly the environmental regulations.

V. CONCLUSIONS

FIRST. The first conclusion of our research is that society has a hidden problem which is the SO_x emissions from ships. Unfortunately, this *silence killer* has a huge impact on the environment, and according with WHO, it is considered as one of the factors with more risk for health. Furthermore, we are accepting the “profits” of the shipping industry as we get cheap products in our day by day, but we are not reacting to the effects of SO_x which is murdering thousands of people every year, principally children and elderly. In fact, the final price of the products do not include the environmental damage caused by its transportation, consequently, we are paying for a non-real price. In this way, the society is an accomplice of this perverse economic system.

SECONDLY. The huge amount of diversity of the actors and interests playing to handle this problem is another difficulty to adopt a suitable and efficacy regulation on SO_x pollution. Moreover, the big imbalance of power, between the actors with shipping interests and those actors concerned on the environment protection, is the main reason why the economic benefit is above the environmental targets. In fact, normative and controls to deal with the sulfur emissions are inexistent or less strict than they must be.

THIRD. One of the consequences on this context, it means, the existing lobbies in the shipping industry, is the use of the shipping flags as an obstacle to cope with the SO_x pollution problem. This convenience flags permits to the owner-ships to escape the environmental law. Actually, even when there are environment regulations, and due to the complex network of the shipping actors, this system allows to the owners-ship to skip from their responsibility for the environment damage. In this line, we do not have to forget that 70,2% of the shipping industry is working under this open registers systems. It means that most of the marine fleet is avoiding its national law which is normally stricter.

FOURTH. Although there are difficulties to deal with the environmental problems from ships, and specifically the sulfur emissions, environmental actions have been taken place though the recent decades at the universal level. Thus, since the end of 20th century, we can find specifically regulation about SO_x emissions from ships working to solve the problem, concretely the rule 14 of Annex VI of MARPOL. However, the soft law is the main kind of regulation in this field. In this line, the current regulation is not

enough to fight against this kind of abuse from the shipping industry. This situation is really unbelievable.

FIFTH. From the universal regulation that has to do with SO_x emissions from ships, we shall highlight the different grade of protection from developed countries, and non-developed countries. While the large sea routes are affecting to all the States, just the occidental ones have controls like the ECAs. Moreover, the non-developed States are the main victims, since owner-ships use its territorial waters as a ship graveyard to continue polluting. Such an example, the Indian Ocean States, most of them developing countries, have the most polluted sea areas with the worst quality waters in the world. This situation shows an intergenerational and intragenerational egoism that is clearly against the sustainable development principle.

SIXTH. In fact, analyzing the legal background, we find a huge difference between the regulation at the universal and the EU level. In the one hand, at the universal level there is a really weak common denominator between the States; for this reason, the adaptation of regulations to cope with the problem is more difficult, and the results are very soft instruments. In the other hand, the common culture of the EU, the reduced number of Member States in comparison with the universal level, and the shared interests of its Members for the environmental protection, makes easier the adoption of efficient regulation, making stronger instruments than at the universal level.

SEVENTH. From this idea, it is important to point out the role of the EU as the main driving in the adoption of standards at the universal level to solve with sulfur pollution. In this way, most of the times, IMO regulations are made taking into account the average EU rules, specifically in the limitation in sulfur pollution. Truly, we should remain that IMO is financed for its members according to the tonnage; it means for the open register States which have the most important tonnage flying under its flags. For this reason, it is easy to understand that such States, like Liberia or Panama, which are taking profit from the shipping flag business, are not interested in adopting stricter regulation. Also, most of the other IMO States are not getting involved in establishing environmental rules since their lobbies from the shipping industry press them to not do it, as Germany and Greece.

EIGHT. Despite all of this, a big problem at the universal and EU level is that the most part of the tonnage is registered on a foreign flag. Consequently, those vessels are avoiding the regulation adopted at its domestic level. Also, as we have seen in the CJEU

jurisprudence, there is incongruence between the limits of the Directives when a non-Member State ship is accomplishing MARPOL but not the EU regulation in a member-State.

NINTH. After analyzing the regulation, we will focus on the control mechanisms. In this point, again, we find a difference between the universal and the EU level. While in the EU level we have the CJEU as a jurisdictional mechanism of control and the SECA, at the universal level we have mainly soft law monitoring systems

TENTH. All these environmental problems, in the last decades, are increasing since we are moving in a process of “*desestatalitacion*” of international environmental responsibility. In practice, there is a clear trend to transfer environmental responsibility issues in the field of relations between States to the sphere of relations between individuals and; therefore, to place them under State civil law standards on liability and applying international private law techniques. This is especially grave because the States are not just responsible for environmental damages but also to prosecute and punish the perpetrators of the facts. Additionally States are responsible for the lack of due diligence in preventing environmental harm. Thus, in some way, States are leaving to assume its responsibilities in environmental matter; this situation puts in danger the environment protection.

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