3
Marine Pollution: Introduction to International Law on Pollution Caused by Ships

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3.1. Introduction

Marine pollution, whatever its source, has long been an ongoing concern for governments, the public and environmental advocates. Yet, for nearly 50 years, this pollution has only continued, growing worse and more varied, and we may wonder what the law is doing to contain this problem efficiently.

Because the sea is an international space, it has naturally fallen – at first, at least, and mainly – to international law to address the issue.

This sector of law has been built bit-by-bit, made up of international conventions that have often multiplied, sometimes more than once, in reaction to a specific event so that this event does not occur again.

However, a real innovation was introduced by the United Nations Convention on the Law of the Sea of December 10, 1982, called the Montego Bay Convention[1] (and generally referred to as UNCLOS). This was not the first time that the formally organized international community had taken an interest in marine pollution, and the United Nations Geneva Convention on the High Seas of April 4, 1958 included several rules concerning pollution by hydrocarbons. These do not compare with the ambition of UNCLOS, however, which devotes Part XII, or articles 192 to 237, to the "Protection and preservation of the marine environment", specifying in its preamble "that it is desirable to establish, by means of this convention, and duly taking into account the sovereignty of all States, a legal system for the seas and oceans that […] advances […] the protection and preservation of the marine environment".

Article 194 of UNCLOS targets all forms of marine pollution[2], and article 192 makes it "the business of governments[3]", flag States[4] and coastal[5] or port States[6]. Measures taken to address these questions may be taken separately[7] or jointly[8].

The committed stance of international law, of part XII of UNCLOS, arising from the framework agreement included in the United Nations Convention on the Law of the Sea, has imposed on States compliance, in particular, with "generally accepted regulations and standards, established via the intermediary of a competent international organization…[9]". These rules, which are not specified by UNCLOS and most of which do not come from the UNCLOS Convention itself, are thus mainly preexisting; that is very specifically, the operational or accidental pollution of the seas by ships and hydrocarbons[10] as laid out by the conventions of the International Maritime Organization (IMO)[11], the only United Nations agency specializing

in matters of global navigation security. Hence, it is a case of relying on international law on marine pollution by ships, since the actions of this law are aimed as much at the prevention of pollution (section 3.2) as at intervention in the event of an accident (section 3.3), and at the repair of damage caused by pollution (section 3.4).

3.2. Preventing pollution by ships

It is clear that, at a time when there are increasingly serious and sometimes irreversible damage-causing events, the prevention of pollution is crucial.

Though the conventions pertaining to pollution provide regulations that are often considered adequate to protect the oceans in their entirety, there is another environmental reality taken into account by international texts: the existence in this already fragile aquatic space of even more vulnerable marine zones which deserve in various ways greater protection than that applicable to the oceans as a whole. It is also important to recognize that in addition to the political zoning of the sea provided for by UNCLOS there is a superimposed system of ecological zoning (section 3.2.1). It falls to the law, then, to design maritime routes that are both safe (section 3.2.2) and clean (section 3.2.3).

3.2.1. *Spatial preconditions: acknowledgment of protected maritime zones*

The International Law of the Sea, as now largely contained in the United Nations Convention on the Law of the Sea, has developed an approach involving a shared ocean divided into an ever-increasing number of maritime zones over which coastal States exercise more or less authority; an authority which diminished as distance from the coast increases. Thus, starting from land territory and moving out to sea, we reach inland waters, then territorial waters, then the contiguous zone, and then the exclusive economic zone containing all or part of the continental shelf, and then the high seas and finally, beneath the high seas, the International Zone. To these "classic" divisions, other specific zones have been added, such as straits, archipelagic waters, enclosed or semi-enclosed seas, ice-covered zones, etc., not to mention transoceanic canals not envisaged by UNCLOS. There is also a system of zoning superimposed on this political/administrative legal marine zoning that is equally diversified but not necessarily compatible with UNCLOS zoning; this is ecological zoning, and it is this that is being referred to when "protected marine areas" are mentioned.

Indeed, it is a current trend to establish "Marine Protected Areas" (MPAs)[12] as attested to by the number of States that have committed to protecting them[13], in the same way as specified in a sometimes limited manner by UNCLOS[14] and as currently being put in motion by the European Union via its "Sea Natura 2000" initiative. The European Natura 2000 initiative, intended to create a network of protected sites throughout the territories of member States (and subsequently the European Community) via application of the so-called "Oiseaux" (or "Birds") directive (directive 79/400/EEC of April 2, 1979, subsequently replaced by directive 1009/147/EC of November 30, 2009) and, especially, by the "Habitats" directive

(directive 92/43/EEC on the conservation of the natural habitats of wild fauna and flora of May 21, 1992), is an Initiative the European Union (following decision by the European Union Court of Justice C26/04 of October 20, 2005), of which asked from now on for an application at sea, in marine areas which would be quite suitable for the application of the Oiseaux and Habitats directives. This was made more concrete by the development by the European Commission in May 2007 of "Guidelines for the establishment of a Natura 2000 network in the marine environment", addressed to Member States obligated to comply with it in order to identify these Natura 2000 zones in their maritime spaces. This was the case, for example, for the Lavezzi Islands, the Strait of Bonifaco and the Bay of Morlaix in France. The Natura 2000 system is legally provided for in France by articles L414-1 to 414-7 of the environmental code. Maritime sites are managed by the current Protected Marine Areas Agency, created by the law of April 14, 2006 and completed by the "National strategy for the creation of PMAs – a doctrinal note for metropolitan waters" of November 20, 2007.

All of this has contributed to the implementation of ecological zoning, often in the form of networks of sites to be protected, in which the international level appears more like a degree of motivation to be determined at the regional or national level of these PMAs, sometimes like a level of decision-making by an international organization, but on request of the States[15]. Such is the notable case in matters of marine pollution by ships – though sometimes insufficient – of the IMO.

Since the 1970s, the IMO has been defining what they call "protected maritime zones" (PMZs), as "intertidal or infratidal zones with the waters covering them, their flora and fauna, and their historic and cultural heritage, which have been categorized with a view to protecting all of part of the environment they compose".

This very broad definition enables a multitude of forms of protection of the aforementioned zones (marine preserves, natural parks, marine parks, sanctuaries, protected sites, etc.):

– spontaneous national protection, first in zones under the sovereign control of coastal States[16];

– incentives and then international certifications followed by national modes of protection[17], forms of regional protection imposed on States[18] or forms of international protection determined, at the request of coastal States, by a system of zoning established by the IMO in particular (if it is a matter of protection against pollution by ships) when it may also have effects reaching beyond territorial waters.

These zones created by the IMO include particularly sensitive sea areas[19] (PSSAs[20]) and "special zones" (SZs) MARPOL[21].

These two principal types of PMZ have quite comparable definitions, though in detail they do not require the same ecological, scientific, economic, cultural or other criteria[22].

The IMO defines a PSSA as a "maritime zone which, due to its recognized ecological, socio-economic, or scientific importance, should be the subject of special protection via measures taken by the Organization [that is, the IMO] and which may be vulnerable to damage caused by

maritime activities"; and an SZ MARPOL is a "maritime zone which, for acknowledge technical reasons having to do with its oceanographic and ecological situation as well as the specific character of its traffic, calls for the adoption of particular required methods in order to prevent marine pollution by [hydrocarbons, chemical products, wastewater, etc., according to the appendices]".

This situation results in a sort of "striated" sea, in which can be seen, superimposed on the various areas of authority of coastal nations specified by UNCLOS[23], "protected marine areas" whose legal systems will be more drastic in matters of environmental protection than for the rest of the seas and oceans, which are more generally protected. Roads through these areas must, as in the rest of the oceans, be safe and clean. To ensure this, since most international conventions having to do with preventing pollution by ships arise from the IMO, the latter can use only protective "tools" in compliance with its "social objective", which is to ensure the safety of transport and not, notably, the protection of species[24], which then occurs only indirectly through the application of IMO instruments. These instruments are intended to use the famous Donaldson report title of 1994, ensure "Safer Ships, Cleaner Seas"; that is to act on the traffic of ships on one hand, and on their construction on the other hand. While this has long served to "protect ships from the sea", today it also helps to "protect the sea from ships" to use the expressions coined by Professor Martine Rémond-Gouilloud [REM 93].

3.2.2. *Safe routes: the organization of maritime traffic in question*

The primary thing that may prevent pollution is undoubtedly, alongside the use of "clean" ships, ensuring that maritime routes are safe enough to avoid the causes of major pollution, collisions, by providing for vessel traffic service (VTS), which takes into account all pollution-causing accident risks in order to reduce the occurrence and consequences of these. These VTS measures are organized principally under the aegis of the Convention on international regulations for preventing collisions at sea, or COLREG[25], as well as in Chapter V of the SOLAS convention (convention on the safeguarding of ships, hygiene and habitability on board and the fight against pollution)[26], not to mention the training of seafarers provided for by the Convention on standards of training, certification and watchkeeping, or STCW convention[27], not seen here[28]. COLREG contains mainly regulations pertaining to steering and sailing, and is best known for its rule 10 relative to provisions for the traffic separation scheme (TSS)[29], which provides, in difficult passes, for the setup of "sea highways" with two or more lanes, each with a direction – climbing or descending – and divided by a separation zone in which traffic, except for perpendicular crossings, is prohibited; these are often accompanied by "caution zones". These TSSs cannot be put in place by coastal States without the prior consent of the IMO if the TSS is partially or wholly outside of territorial waters, or only after declaration if it is fully within territorial waters or a strait less than 24 nautical miles wide.

In order to protect areas that are vulnerable to pollution by ships, particularly following accidents[30], States often turn to the setup of these types of TSSs. However, other measures are taken as well, in particular to protect a PSSA. All these measures are relative to the conditions

of ship traffic presenting a risk of pollution.

The IMO can allow the setting up of "deep water routes" that are sometimes recommended, but may also be imposed on deep-draught ships for areas where hydrographic studies are non-existent or inadequate. In this case, this lack of knowledge may cause doubt with regard to the depth of the sea-bottom and thus to the ability of certain classes of ships to pass through a given zone with enough molded depth[31]. This is also the case for areas where hydrographic studies specify the depth of the sea-bottom and the existence of submerged objects.

Conversely, the IMO may establish "avoidance zones", meaning, according to this organization, "a zone located within predetermined limits, within which navigation is particularly dangerous, or within which it is particularly important to avoid accidents and which should be avoided by all ships or certain classes of ships[32]".

Following the disasters suffered by the *Sea Empress* in 1996, the *Erika* in 1999 and the *Prestige* in 2002, France, as well as other coastal States affected by these catastrophes – Ireland, Spain, the United Kingdom, Portugal, etc. – requested that an entire part of the North Atlantic economic zone, from southern Portugal to the Celtic Sea (excluding the North sea) as a PSSA, to be protected via the establishment of an area to be avoided (ATBA) for supertankers. The IMO refused to grant this classification, however, except for non-double-hulled tankers of more than 600 gross registered tons (grt) transporting heavy oil. Though it judged ATBA classification to be overly excessive, the IMO acknowledged the existence of a PSSA in order to attract crews' attention to the vulnerable nature of the marine environment being crossed, and allowed the States concerned to require other ships and double-hull tankers to complete a CR 48 h before entering the area, but did not allow the requirement of compulsory pilotage, which the IMO also refused for the Strait of Bonifacio, preferring simply to designate it as an area where "deep-sea pilotage [is] strongly recommended[33]".

The institution of and compliance with all these measures, whether compulsory or not, are ensured by the coastal State (or States, if there are several) via the implementation of [34] VTSs, which range from the simple broadcasting of messages to ships (meteorology, status of sea traffic, etc.) to the use of more extensive services such as TSS.

The existence of a "code of the sea" of this type would not be enough if ship design was not also part of the picture, as safer ships enable cleaner seas.

3.2.3. *Clean routes: design and management of the ships in question*

If it is not enough for navigation rules to be established or even respected in order to protect the sea from ships and ensure maritime safety, it is because these ships must themselves be designed as "clean ships". In this, design and management are crucial. Solid ships must be constructed, and the 1966 IMO Load Lines convention, for example, is an important part of this. These ships must be as clean in terms of both construction and procedures (particularly having to do with waste disposal) as possible. For this reason, most ship-caused pollution is addressed in IMO texts, of which only the current MARPOL convention is legally binding at the moment (section 3.2.3.1), while "newer" forms of pollution are still addressed through

existing texts, most of which are not yet binding, at least at the international level (section 3.2.3.2).

3.2.3.1. *From OILPOL 1954 to MARPOL 1973–1978: principal binding laws*

Some regulations existed before the 2nd World War, mainly at the national level; these had to do mostly with operational hydrocarbon pollution in ports. However, it was not until the post-war years that the international community, faced with the challenge of developing maritime transport for mineral resources such as hydrocarbons on ships that were constantly growing larger and larger, and thus more dangerous for the environment in the event of collision or beaching[35], finalized the first convention concerning "marine prevention of pollution by hydrocarbons" in 1954, known by the acronym OILPOL, for Oil Pollution. It was placed under the responsibility of the IM[C]O[36] as soon as the convention establishing this new international organization went into effect. Despite the innovations introduced by OILPOL, it quickly proved inadequate, and, especially after the disaster suffered of the Isles of Scilly by the Liberian oil tanker *Torrey Canyon*, the IMO attacked the problem of hydrocarbon pollution with new vigor. A new, broader convention was developed "for the prevention of marine pollution by ships", or MARPOL, in 1973. Because its entry into force proved a lengthy process, it was modified to speed up its applicability in 1978.

Today, though some rules for the prevention of marine pollution can be found in other IMO conventions, notably within various chapters of the 1974 SOLAS convention[37], it is the MARPOL (for Marine Pollution) convention that includes, to quote the aforementioned article 211 of UNCLOS, "generally accepted international regulations and standards" applicable to pollution by ships.

Unprecedented in its composition, this MARPOL convention is formed of a framework convention containing its general conditions of application[38], accompanied by two protocols; one on the settlement of disputes between signatory States, and the other on the sending of reports pertaining to events causing or with the ability to result in waste composed of harmful substances. It essentially defines the technical regulations thus imposed on signatory States in a number of appendices which currently stand at six and which are regularly amended and concern various sources of marine pollution by ships:

– appendix I: pollution by hydrocarbons;

– appendix II: pollution by chemical products transported loose in bulk;

– appendix III: pollution by chemical products transported in packages, trucks, wagons, containers, etc.;

– appendix IV: pollution by wastewater;

– appendix V: pollution by garbage;

– appendix VI: atmospheric pollution by ships.

The first five appendices date from the same time as the framework convention and the

protocols. The first two appendices are compulsory for any State that is a signatory to MARPOL, while the other appendices remain voluntary. Appendix VI was added much later, in 1997. It is optional for States and is part of existing international legislation relative to the fight against climatic change. All of these appendices have entered into force, but some of their amendments still have not.

Each appendix is symmetrically constructed and concerns two angles for the prevention of the pollution to which it is devoted. The first angle concerns the design and fitting-out of ships[39], and the second angle concerns a waste-management system[40]. This system is much more drastic[41] in zones recognized by the IMO, appendix by appendix, as MARPOL special zones[42], with a single objective: making operational pollution as well as the consequences of accidental pollution as minimal as possible[43], or even non-existent.

Ensuring compliance with these technical requirements, as well as with SOLAS provisions and some ILO conventions, is first managed by the flag State, which assumes responsibility in this area and delegates this task to classification companies which then issue international certificates. But, these checks are also, and sometimes especially, carried out by port State controls[44], which have existed in Europe since 1973, and under the aegis of the inter-administrative accord entitled the Memorandum of Understanding (MOU) signed in Paris in 1982. Since its inception, this accord has given rise to numerous emulators worldwide and, since the 1990s, has been compulsory in France under European Union law[45]. A tanker that does not respect one or another of these conventions may be boarded and searched in port, and allowed to leave this port only to travel to a naval shipyard in order to be fitted out in accordance with relevant international standards.

Thus, the MARPOL convention is extremely technical; not only in terms of vessel construction standards, but also with regard to regulations and conditions concerning the management and disposal of any waste that these vessels may introduce into the environment. MARPOL details infractions[46], leaving it to signatory States and coastal and flag States to define the penalties that will be attached to these infractions[47]. However, if the coastal State thus has full jurisdiction to prosecute polluting ships, particularly those guilty of illegal waste disposal, this jurisdiction can only be exercised if the pollution occurs within 12 miles of territorial waters. Things are also different and more complicated if the pollution occurs in an Exclusive Economic Zone (EEZ). In this case, the flag State has certain rights of legal action exclusive to certain conditions specified by article 228 of UNCLOS which shift pollution repression measures to jurisdictions of nations other than the flag State except in cases of serious pollution. According to article 228, except in cases of serious pollution, legal action must be ceased before the courts of the polluted State, if the flag State has undertaken legal action toward its ship within a certain deadline; if it organizes deterring sanctions in the matter; and if this State is trustworthy in its desire to effectively prosecute its polluting vessels. This article was recently emphasized before the French courts[48] and has often been brought up subsequently, expressing the anger of polluted populations and marine environmental protection organizations, especially when the penalties imposed by the legal system of the flag State are less severe, and thus less dissuasive, than those imposed by French jurisdiction[49].

Other forms of pollution by ships have been the subject of media coverage recently, and have attracted IMO regulatory efforts. For years, it has been planned to add new appendices to the MARPOL convention, following the example of what was done for appendix 6 relative to atmospheric pollution by ships, the only appendix that does not date from the drafting of the initial convention. Yet, in matters of these other sources of marine pollution by ships, the IMO has chosen to enact separate conventions that have no link to MARPOL. Such is the case for the issue of the introduction into marine waters of a foreign or exogenous living organism trapped in the ballast waters of ships making international voyages; for antifouling paints, and for the recurring issue of ship recycling; all significant sources of pollution which are the subject of IMO conventions that have not yet all gone into effect.

3.2.3.2. *Taking new pollutants into account: waiting for the entry into force of certain pertinent IMO conventions, or the awkward realm of soft law at the international level*

The issue of pollution by ships appeared on the legal horizon in the face of disasters such as black tides. It is no surprise, therefore, that oil and chemical tankers are the primary vessels targeted and regulated by law, due to the dangerous nature of the cargoes they carry. However, MARPOL already considers forms of pollution that have no relationship to cargo: wastewater, garbage, etc. It is necessary to acknowledge that all ships – whatever their cargo – are liable, due to the very fact of being ships, to cause pollution by means other than their cargoes. The regulation of these "other" pollutants has been undertaken by the IMO as well as certain regional international organizations, such as the European Union: invasive species (section 3.2.3.2.1), antifoulings (section 3.2.3.2.2) and the very general but crucial issue of recycling ships at the end of their lifecycles (section 3.2.3.2.3). In these three cases, intended to provide a more complete response than the one given by the SOLAS and MARPOL conventions, for example, as with the IMO's[50] promotion of the *cradle to grave*[51] objective for new ships, the existing conventions have not yet all gone into effect at the international level, which does not prevent certain States or organizations[52] from setting local standards or using guidelines and other non-binding IMO circulars, embedded in this case in soft law, despite repeated calls by the IMO secretary-general to ratify these conventions as rapidly as possible see below.

3.2.3.2.1. Prevention of the introduction of exogenous organisms or invasive species

Article 196 of UNCLOS very clearly states that "States must take all necessary measures to prevent, reduce, and control marine environmental pollution […] resulting from the introduction of new or foreign species liable to provoke significant harmful changes".

There are several ways of introducing foreign species into a marine environment, not all of which necessarily constitute pollution. This is the case, for example, with the natural displacement of some species due to the opening of canals connecting two maritime ecosystems that had been previously separated by nature, or with repopulation when a species has been eradicated and efforts are made to revitalize the economy by introducing an equivalent foreign species[53]. Navigation is indisputably the most concerning activity of this

type for the international community; even though only 3% at most of living exogenous species displaced in this way adapt to their new environment, there are some that completely destroy the local biodiversity and ecosystems into which they are introduced. Vulnerable Australian mariculture zones were especially victimized by cases such as this in the 1990s, which also saw the addressing by various national and international authorities of the issue of "marine pollution" as considered by article 196 of UNCLOS, mentioned above[54]. The IMO had no choice but to submit, particularly under pressure from Australia and Canada, which were especially affected, and in 1991 established the first guidelines[55] on the subject by inciting ships to keep a log of ballast water shifts, changes of ballast water in seas more than 2,000 m deep, etc. These guidelines were not legally binding, however, and on February 13, 2004 the international community established a convention relative to the control and management of ballast water and sediment by ships (called BWM, for Ballast Water Management) which made most of the provisions contained in the 1991 guidelines legally binding but adapted them with regard to possible technical advances in the area. Unfortunately, this BWM convention has not yet been made effective, and the guidelines, which have been modified, remain applicable only at the global level, and are still optional, leaving room for national regulations currently under discussion[56].

3.2.3.2.2. Prevention of pollution by antifoulings

Antifoulings are applied to the hulls of ships to ensure safety, the maneuverability of the ship, protection against corrosion, etc. This paint formerly contained small amounts of tributyltin (TBT), a substance which, accumulating in the water, rapidly proved biocidal[57]. Considered a polluting substance and prohibited as such, antifoulings containing TBT were not included in existing regulations, notably at the European level. Denouncing this paint in the 1992 Rio Agenda 21 as a significant pollution issue, on October 5, 2001 the IMO introduced an international convention relative to the control of harmful shipboard antifouling systems, called the Anti-Fouling System (AFS) convention. This convention prohibits the use of any harmful organotin compounds in marine paints as well as the use of other harmful substances for antifouling purposes. The AFS convention was expected to go into effect in 2002, and the European Union adopted regulation 783/2003/EC on April 14, 2003 to ensure its initial application at the regional level. Subsequently, save for the application of local or national rules, only the IMO's recommendations on the subject were applicable at the international level until the AFS convention finally took effect on September 17, 2008.

3.2.3.2.3. The question of recycling ships at the end of their lifecycle

It goes without saying that, in the context of analyzing the lifecycles[58] of ships and the "cradle to grave" concept embraced by the IMO, the question of recycling ships at the end of life must come up. Indeed, this has been included as a requirement among IMO provisions (particularly with regard to double-hull oil tankers) due to the fact that most maritime accidents have been due in the past to the advanced age of the ships involved. All of this has also resulted in the refreshment of some fleets, necessitating the recycling of old ships that no longer meet standards. End-of-life ships can be legally treated as garbage, and the 1989 Basel convention

on cross-border transport of waste could be partially applied, but there were no rules specific to the recycling of ships that could not end their lives in any other way (as breakwaters, for example). The IMO, in its directives[59] relative to recycling, modified in 2005, reiterates that, while the principle of recycling ships is a good one in itself, the labor practices and environmental standards observed in recycling facilities often leave much to be desired[60]. However, these directives are not legally binding and should be replaced by a compulsory text.

The question of ship recycling, then, was one of the fundamental elements of sustainable development when the IMO made its 2012 contribution, during the Rio + 20 international summit, relative to the concept of a sustainable maritime transportation system. This legal void concerning recycling was filled by the Member States of the IMO with the adoption on May 15, 2009 of the Hong Kong convention for the safe and environmentally sound recycling of ships. With a view to encouraging the entry into force of this convention and emphasizing the importance of it, and in view of the fact that only three nations, including France on July 2, 2014, have ratified it to date, the European Union has recently put forth a regulation relative to this issue[61], which includes a list of substances and materials prohibited aboard new vessels and supplying a European list of recycling facilities worldwide corresponding to the environmental criteria of the Hong Kong convention.

Despite all these provisions implemented mainly in order to prevent operational pollution, it is undeniable that all these measures, even Marine Traffic Organization (MTO), cannot avoid accidents and pollution in every case, though MARPOL regulations are intended to reduce the consequences of accidental pollution. This leads to the question of intervention on a ship posing a threat to the marine environment.

3.3. Intervention in the event of accidents or risk of accidents

Accidents at sea occur frequently and may, whether the ship is substandard or not, lead to more or less major pollution, and notably to black tides, if the ship's cargo is composed of hydrocarbons.

Thus, the IMO, after first envisioning the ability of a third-party State to intervene on the high seas in the place and without the prior approval of the flag State (section 3.3.2), eventually made it compulsory for shipowners, States, port authorities, etc., to provide emergency mechanisms to be used in the event of accidental pollution (section 3.3.1).

3.3.1. *Preparedness via the OPRC convention*

Discussing preparedness here is somewhat remarkable, considering that the *Oil Pollution Preparedness Response and Cooperation* (OPRC) only dates from November 30, 1990, though the international desire to cooperate in the protection of the oceans goes back to the 1920s. In actuality, the international community did not begin by establishing rules requiring anti-pollution equipment in case of incidents on board oil or chemical tankers, as the SOLAS

convention did when defining obligations relative to lifesaving equipment in 1914. These rules would not be set for oil tankers until 1990 by the OPRC convention, which was supplemented in 2000 by a protocol relative to noxious and potentially dangerous substances (the HNS protocol), which went into effect on June 14, 2007.

The 1990 convention required signatory States to create regional and national emergency control plans (also in compliance with the recommendation made by article 199 of UNCLOS) to be put into action in the event of incidents causing marine pollution. Such plans already existed in some States[62] and maritime regions, notably as part of conventions on the protection of "regional seas" established under the aegis of the United Nations Environment Program (UNEP)[63]. However, the OPRC convention also requires emergency plans on board ships and in the ports of signatory States – a very new development.

This convention also fills in an international legal void that had previously been filled only by the acknowledged ability of coastal States to intervene aboard foreign vessels threatening their coasts (this allowance is of course still in existence). The OPRC convention completes the provision established by international law, though the order of these steps was somewhat irregular.

3.3.2. *From the 1969 IMO convention on intervention to article 221 of UNCLOS*

The 1967 *Torrey Canyon* disaster was indisputably responsible for the increased awareness of the necessity of developing an international legal corpus beyond OILPOL, the existing prevention convention at the time. One of the first elements of this corpus was the 1969 IMO convention on high-seas intervention[64]. The oil tanker Torrey Canyon sank of the southern coast of Great Britain in the open sea north of France; that is in a space where, legally, only the flag State – Liberia in this case – was allowed to intervene on board the ship on the basis of the applicable law of the time. Because the oil tanker's cargo, leaking into the sea, posed a threat to the French and British coasts, authorities in these two States (though they were not competent to do so under the Law of the Sea) made the decision to intervene on the high seas aboard the foreign vessel, which they chose to sink in order to avoid serious damage to their respective coasts and to related activities by their own nationals. It was decided to retroactively approve this infringement upon the Law of the Sea via an IMO convention which, by its universal nature, was the only body authorized to modify the principle of freedom of the seas on this point, and consequently impose the non-interference of the flag State in cases of imminent danger of hydrocarbon pollution caused by an accident and threatening the shores of one or more coastal States and their relevant activities. This convention was often used without ever requiring the coastal State to intervene, as well as without allowing the flag State to object to this interference, considered a case of self-defense, or "self-protection" under international law. In 1978, the disaster involving the *Amoco Cadiz* – though not considered on the basis of IMO texts – caused the emergence of a problem in the course of this intervention, at the same time as the United Nations was debating the content of the future UNCLOS. France then proposed the addition to part XII of this convention on the Law of the Sea of an article it

had written itself: article 221, which is applicable today within signatory States of UNCLOS, which reuses most of the 1969 convention on intervention while refining it in terms of efficiency.

According to the currently applicable article 221:

> No provision included in this part will infringe upon the right possessed by States under both traditional and conventional international law to take and cause to be applied beyond territorial waters measures proportional to the damage they have sustained, or by which they are threatened, in order to protect their coastline or related interests, including fishing, against pollution or the threat of pollution resulting from an accident at sea, or from acts linked to an accident at sea, which may reasonably be expected to have harmful consequences.
>
> For the purposes of this article, "accident at sea" should be taken to mean a collision, sinking, or other navigation incident or event occurring on board or outside a ship causing material damage or an imminent threat of material damage for a ship or its cargo.

This article thus enables a coastal State of the coast of which, beyond the 12 miles of territorial waters, including in an exclusive economic zone, a polluting accident occurs, to intervene in order to limit the consequences of the situation on its coasts. It also – and this is the innovation introduced by the French version in comparison to the IMO convention on deep-sea intervention and to traditional maritime practices respecting the competence of the flag State – to "cause commensurate measures to be taken". The intention of this new addition was to make conventional, and thus legal internationally, a contractual practice that certain tugboats, particularly French ones, implemented in the case of an accident involving assistance provided to a tanker: the Lloyd's Open Form (LOF) of 1983, and then of 1990. Its goal was to allow a threatened coastal nation to do what it could not truly do legally up to that point: impose, rather than simply proposing, assistance measures it judged necessary, such as the obligation to accept forced assistance, which theoretically, in the case of the Amoco Cadiz, would have prevented the black tide that followed due to overly long negotiations on the amount of the payment due for assistance between the ship and the tugboat. Long criticized and not truly addressed by the 1989 London convention on assistance, this possibility was adopted by a number of States, including its staunchest opponent, the United Kingdom, following the Erika disaster in 1999.

In spite of all these regulations, even when refined to enable maximum efficiency against both pollution and the aggravation caused by this pollution, it often occurs that damages are inflicted for which legal reparations must be made.

3.4. Reparations in the event of damage caused by pollution

France, with its Atlantic coast in particular, is well placed to be aware that accidents happen and that black tides may reach its coasts, often at night, despite all the precautions that may

have been taken to prevent a catastrophe from occurring.

There are occasions, therefore, when the question of reparation for damages caused arises. The responsibility incurred may be criminal, arising partially or wholly from domestic[65] or European law in matters involving European Union Member States. International law has developed mainly instruments of civil responsibility. Though this existing international law is not limited to the reparation of damages by hydrocarbons, only conventions having to do specifically with this are currently in force, and thus applicable (section 3.4.1). These are the conventions, still extant in their 1992 version, on the civil responsibility of the owners of ships transporting hydrocarbons (CLC 1992, or Civil Liability Convention of 1992) and on the International Oil Pollution Compensation Fund (IOPC 1992), with the former preceded by a 1969 CLC convention and the latter by a 1971 IOPC convention which they are aimed at improving, and through which the IMO applies the "polluter pays" principle. Some additional modifications have recently proved necessary[66] (section 3.4.2).

3.4.1. *The prioritizing of reparations for pollution by hydrocarbons*

This is undoubtedly the vestige of a system of law developed in reaction to an event, but it is indisputable that international law on marine pollution began its focus on reparations for marine pollution by hydrocarbons after the symbolic 1967 disaster involving the *Torrey Canyon* and the other frequent and highly visible black tides that followed. The cleanliness of oil is self-evident; there are black globules on beaches, and birds stuck in the open sea, and both authorities and the public have fully processed these sights[67]. The issue of pollution by hydrocarbons has, therefore, been prioritized ("all that black on all that white", sighed Professor Martine Rémond-Gouilloud [REM 89] after the Exxon Valdez disaster in Alaska), including matters of reparation. While other substances, mostly chemical but not entirely (palm oil, etc.), are also dangerous for both ecosystems and human health, they are not – as widespread as they are, and often even more dangerous – as "spectacular".

There is another convention that addresses reparation for noxious and potentially dangerous substances (the HNS convention, for Hazardous and Noxious Substances) other than the hydrocarbons targeted by the OMI CLC, modeled after conventions having to do with hydrocarbons. However, the HNS convention has not yet gone into force, though preparatory work has continued since the 1960s, and though it was signed in 1996 and a protocol negotiated in 2010 is intended to help make this entry into force happen as soon as possible due to modifications of the initial text. It is now a matter of ratifying the HNS 2010 convention. It is self-evident that the international community is regularly bothered by concerns relative to the risks posed by this "invisible tide", but there are technical questions posed that trouble certain States whose consent is needed to ensure the entry into force of the HNS convention. France considered ratifying the convention at the time of the October 31, 2000 sinking of the Italian chemical tanker *Ievoli Sun* of the coast of The Hague, the cargo of which included 4,000 tons of styrene[68]. The question of a possible catastrophe led the French government to consider ratifying the convention, which it did not do in the end because the threatened marine environmental disaster involving the Italian ship did not occur[69]. At a time when environmental

principles of prevention and precaution are being validated and promoted, States are clearly still having difficulty being prepared for disasters; these States include even France, which spearheaded the work to modify the HNS convention in 2010 and has ratified it since then, but without the effect of bringing it into force.

For these reasons, only conventions relative to reparation for damages in the event of pollution by hydrocarbons are currently possible; the black tides that follow these polluting events (and the lack of major chemical polluting events) have rendered it so.

3.4.2. *The IMO Civil Liability Convention and FIPOL 1992*

With regard to responsibility and reparation, we must still identify the damages that are considered eligible for reparation by mobilizable international conventions (section 3.4.2.1) before examining how this responsibility is framed and limited (section 3.4.2.2).

3.4.2.1. *Reparable damages*

The position of the law with regard to responsibility and reparation for damages is that reparations are made only for direct, assured and assessable damages.

Reparation for "anthropocentric" damages, or damages caused to humans[70], their goods[71], or their activities[72], has never been truly problematic in comparison to reparation for patrimonial damages[73], because anthropocentric damages can be assessed more or less easily, and their certainty attested to[74].

Thus, anthropocentric damages are naturally the only ones currently indisputably recognized by IMO conventions on the subject as compensable, under the conditions provided for by these conventions[75].

This is not the case for ecological damage; that is damage caused to the environment as such, which has often been considered uncertain and non-assessable, and thus non-compensable except sometimes symbolically[76] or by application of mathematical equations and other fixed solutions, but these are principally at the national level[77].

Moreover, this ecological damage is not precisely addressed by international texts relevant to the subject.

According to article 1.6 of the 1992 CLC, "Damage by pollution means:

> a) harm or damage caused outside of a ship via contamination arising as the result of a leak or expulsion of hydrocarbons from the ship, or which this leak or expulsion produces, it being understood that reparations paid for environmental changes other than lack of earnings due to these changes will be limited to the cost of the measures reasonably required for restoration that have been or will be implemented;
>
> b) the cost of safeguarding measures and other harm or damage caused by these measures".

Article 1.7 specifies that: "Conservation measures refer to all reasonable measures taken by any person after the occurrence of an incident in order to prevent or limit pollution".

It is expressly stated that environmental damages are not considered to fall under the definition of "damage by pollution" provided by the CLC and also used by the 1992 FIPOL convention, except with regard to reasonable restoration and patrimonial costs[78]. This solution, according to FIPOL officers, does not have adequate financial resources to cover these damages via State contributions except where a political decision to the contrary is made. If States wish to make reparations for ecological damage, they must only change the definition of damage by pollution[79] given by the texts and accept an increase in their contribution to FIPOL, which only functions as an insurance "mutual fund", or something very similar to it.

However, this issue continues to receive extensive media coverage, and numerous cases of national legislation and jurisdiction are making allowances for the acknowledgement and assessment of and compensation for environmental damage in addition to CLC/FIPOL reparations.

This type of damage raises specific questions in terms of responsibility with regard to its certainty, its assessable nature and above all the identity of its victim, which is not a person *a priori*, but rather an animal, vegetable, or mineral, etc. Responsibility is perceived above all in law as a relationship between two individuals (a victim and a culprit, or a creditor and a debtor). Yet, social demand has compelled the application of the classic model of responsibility to ecological damage, for better or worse. States including Italy and Russia have issued legislation since the late 1970s authorizing reparations for ecological damage, and some national jurisdictions have done much the same; the very recent and unprecedented position of the French Court of Cassation[80] on the *Erika* disaster is a particularly striking example of this.

3.4.2.2. *Closely supervised and still-limited reparations*

The objective of developing the Civil Liability Convention and the FIPOL convention is to promote and facilitate reparations for damages caused for victims, but without guaranteeing total reparations in every case. This is an "old" custom of commercial maritime law according to which, because maritime expeditions include a high degree of risk by their very nature, the responsibility of operators is limited in terms of the amount of reparations they must pay for damages caused[81] if these damages existed during the expedition. The same is true for the transport of dangerous merchandise such as hydrocarbons, and more broadly for marine pollution caused by ships.

This system of reparations is organized into two stages:

– First, reparations are due to be paid by the owner of the ship responsible for the pollution, who is often insured, since insurance is compulsory for ships of more than 700 grt. Responsibility falls objectively on the "owner" of the ship regardless of the actual fault of this owner[82]. Conversely, the CLC specifies that the owner's responsibility to pay cannot, whatever the assessment of the amount of damage caused, exceed a certain limit[83], based on what is called "limitation of responsibility" in maritime law.

– Next, if the assessed damage exceeds the CLC limit, responsibility falls upon the loaders (oil companies that have oil transported by ship) to pay an additional contribution to these

reparations. This additional amount, paid by FIPOL, an international organization in its own right, financed by contributions by signatory States[84], is limited in its turn[85] and has proven insufficient to cover the larger and larger amounts of damage caused. It was decided, immediately after the *Prestige* disaster of the Galician coast in November 2002, to develop a third convention that would enable full reparation for damages caused by a black tide. This was accomplished on May 16, 2003 with the creation of a fund called the "Supplementary Fund" or FIPOL II, which is attached to FIPOL 1992 as far as its signatory States are concerned but remains legally separate.

Thus, in the event of compensable damages caused by a black tide, compensation can occur at three levels. The owner – or, more precisely, his/her insurer, if applicable – is the first to pay. If the overall amount of the damages exceeds the maximum amount of reparations set by the CLC and paid by the owner, victims can obtain an additional amount from FIPOL[86], the amount of which is also limited. For signatory States to the supplementary fund that became effective on March 3, 2005, and if the FIPOL 1992 supplement is still not enough to cover full reparations, victims are able to mobilize this third level of compensation[87]. This maximum compensation can reach the equivalent in SDR[88] of 900 million euros[89].

It is clear, then, as we conclude this presentation of the international system of measures against marine pollution by ships, that the IMO plays a crucial role in ensuring uniform protection of the environment, which agrees with its stated goal in 2012 to develop "the concept of a sustainable maritime transport system".

Yet, it is evident that, despite well-executed achievements significant efforts in terms of application, often including ratification to enable the entry into force of international legal instruments, remain to be made.

In the Biennum, its strategic plan for 2014–2019, the IMO reiterates that "the mission of the International Maritime Organization (IMO), as a United Nations specialized agency, is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation. This will be accomplished by adopting the highest standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships, as well as through consideration in the related legal matters and effective implementation of IMO's instruments, with the view of their universal and uniform application[90]".

It remains the case that though tireless efforts must continue to ensure the effectiveness of the international environmental provisions of the IMO, the organization must also carry out this mission in a context of particularly harried globalization, in which the fundamental human question of safety (piracy, terrorism, etc.) competes for attention with maritime security and, due to its urgency, may supplant it at times, further delaying progress in the protection of the sea from ships in favor of more effectively protecting humans at sea from the actions of other humans.

3.5. Bibliography

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1 Effective date December 16, 1994.

2 See part XII of UNCLOS which is more or less precise depending on the type of pollution.

3 According to article 192, "States have an obligation to protect and preserve the marine environment".

4 Article 217 of UNCLOS.

5 Article 220 of UNCLOS.

6 Article 218 of UNCLOS.

7 Including in unilateralism, such as the position of the United States following the 1989 Exxon Valdez catastrophe in Alaska, with regard to the development of the Oil Pollution Act of August 18, 1990 – see [REM 91].

8 Article 194.1 of UNCLOS.

9 Article 211.2 of UNCLOS.

10 Though the principal form of maritime pollution is telluric pollution, which is very scantily regulated, and though pollution by ships by hydrocarbons remains a lesser problem, media coverage of black tides has led international law to develop mostly with regard to marine pollution by ships; therefore, this will be the only type of pollution discussed here.

11 Other regional international organizations such as the ILO have of course intervened, usually in ways compatible with IMO conventions; see European Union policy on the subject, for example.

12 The creation of which on the high seas has very recently been quite specifically defended by the Global Ocean Commission's report entitled "From Decline to Recovery – A Rescue Package for the Global Ocean", June 24, 2014, available at the Commission's Website: http://issuu.com/missionocean/docs/goc_full_report/0.

13 For example, the recent classification by Nauru, Pitcairn and Palau of their exclusive economic zone as a preserve, or even sanctuary, enabling the creation of immense marine reserves (603,678 km² for Palau, for example, which is larger than the land area of mainland France). See also the American proposal to classify the Pacific Ocean as a preserve, and the Kiribati proposition in the June 17, 2014 edition of *L'Express*. See also the French decisions after the Grenelle of the Sea to create a blue framework or corridor via the setting up of a network of MPAs covering 10% of the French EEZ by 2012 and 20% of this French maritime space by 2020.

14 See article 194.5, which evokes the measures needing to be taken "to protect and preserve rare or delicate ecosystems as well as the habitat of species and other marine organisms in decline, threatened, or in danger of extinction"; see also article 234 on "ice-covered zones" or part IX of UNCLOS on enclosed and semi-enclosed seas, completed by the complicated "regional seas" program of the UN Environment Program (UNEP), instituted in the mid-1970s.

15 One exception may be seen, for example, in the decision made directly in 1994 by the International Whaling Commission to classify the Antarctic as a sanctuary for cetaceans.

16 See article L334-1 and following of the French environmental code on "natural marine parks" for example. It should be noted that the majority of PMZs are found near coasts; that is in inland seas and territorial waters.

17 See “UNESCO natural world heritage sites” and their protection via their designation in France, for example, as preserves or registered sites, among other existing provisions.

18 See the Natura 2000 sea network for the aforementioned European Union Member States.

19 In 2011, the IMO agreed to classify the Strait of Bonifacio as such, an international strait separating Corsica and Sardinia and containing particularly rich biodiversity representative of a future international marine park.

20 For Particularly Sensitive Sea Area.

21 Or “emission zones” for appendix VI of MARPOL – see *infra*.

22 See, for example, the IMO circular, MEPC 1/Circ.778 of 01-26-2012.

23 Territorial waters, contiguous zone, exclusive economic zone, etc.

24 See, however, the criterion for the protection of resources in the definition of special zones, as an objective added to article 211-6 of UNCLOS, which refers to it. See also, in the “regional seas” program of UNEP, certain conventions combined with protocols pertaining to the protection of biodiversity via the establishment of “specially protected areas and specially protected areas of Mediterranean importance” (SPA and SPAMI), with the Pelagos sanctuary standing as the primary example of a SPAMI.

25 Or Collision Regulations, the 1972 IMO convention made effective on July 15, 1977, amended several times since.

26 Convention which also provides, in rule 8-1, for the implementation of compulsory reporting (CR), which captains must do – normally at the request of a flag state, but most often at the request of a coastal state – upon entering an at-risk zone such as, in France, before entry into the rail d’Ouessant (see *infra*): identity of ship, port of departure, destination port, cargo contents, etc. (SURNAV). These mandatory reports go along with a number of provisions specified by this “code of the sea”, especially for ships transporting polluting substances. These CRs are now required before entry into any port of the European Union, following directive 2002/57/CE of June 27, 2002 (the Erika II packet) modified in 2009 (Erika III packet), which notably created the traffic and information monitoring system (Safe Sea Net system), also modified in 2009, and addressing the question of ports of refuge.

27 In its modified version and to which several International Labor Organization (ILO) conventions have been added in the same area.

28 We refer readers to Chapter 2 of this book.

29 Still called “rails”, the best known of which in France is off the coast of Finistère, the rail d’Ouessant is affected by the TSS of Pas-de-Calais and is currently in the process of being modified.

30 See, for example, the implementation of the TSS as a mode of protection of the marine environment, provided for by articles 22 (territorial waters), 41 (straits), 53-4 and following (archipelagic waters), 211, etc., of UNCLOS. See the implementation of the TSS in the Bosphorous strait, which is extremely narrow but has been very highly frequented, particularly by supertankers, following a maritime accident in 1979 suffered by the *L'Independenta*, which caused a fire in Istanbul, a coastal city. See also the TSSs in the strait of Singapore.

31 See, for example, the creation of a deep-water route on the outskirts of King Abdullah port on the northern coast of the Red Sea (Saudi Arabia) or the modification of the existing deep-water route in the Pas-de-Calais TSS.

32 For example: the creation of an ATBA in the Atlantic Ocean off the coast of Ghana; the establishment of a compulsory anchoring-prohibited zone for all vessels and an ATBA for ships of more than 300 grt; related protective measures for the preservation of the Banc de Saba PSSA; and an ATBA on the Australian Great Barrier Reef, greater pressure in the enforcement of which was requested of the IMO in 2014.

33 See, for example, the motion of the Corsica Assembly of January 27-28, 2011 no. 2011/E1/002.

34 These include *centres régionaux opérationnels de surveillance et de sauvetage* (CROSS) [regional operational search and rescue centers] in France, including CROSS Etel A and CROSS Corsen, which monitor traffic in the rail d'Ouessant in the open seas off Brest, but may also be simple buoys delineating a recommended route or pilotage service.

35 See the construction of so-called "pre-MARPOL" ships.

36 The IMO was first created in 1958 as the Inter-Governmental Maritime Consultative Organization (IMCO).

37 This convention, one of the oldest in the international Law of the Sea, with versions dating from the early 20th Century (the first from 1914, following the sinking of the *Titanic*), pertains to the safeguarding of human life at sea and contains several provisions that play a role in anti-pollution matters: the double-rudder system that was missing on the *AmocoCadiz*; collision-limiting rules, and the International Safety Management code, or ISM, of November 4, 1993, which deals with both the management of safety aboard ships and the prevention of pollution. If it had been applied aboard the *Erika*, many abstruse management practices would have been prevented.

38 Applicable in any "maritime space under jurisdiction", and thus also in EEZ, this framework convention also contains a whole series of definitions of terms used, including "waste", "ship", etc., as well as some very general rules that are not highly operational, with the most important ones found in the appendices to the convention (see *infra*).

39 Oil tankers must have, if possible, separated ballast, and must be equipped with sloop tanks

and continuous waste control systems. They must be double-hulled (or the equivalent) and have a specific size of waste sorter determined by category of waste as well as by standards of labeling, the stowage of dangerous merchandise transported in packages, wagons, or sulfur oxide waste in the air resulting from the use of certain marine fuels, and all of this must be attested to by international certifications, the regularity of which is verified during checks by each port nation.

40 This waste is prohibited on principle except in specific conditions where it is authorized – see *infra*.

41 Contrary, perhaps, to what is often said, the principle of MARPOL's appendix I on hydrocarbons, for example, does not concern the prohibition of waste or deballasting, but rather its regulation (continuous ongoing onboard waste control system that cannot contain more than 15 PPM of hydrocarbons, at a certain distance from the nearest coast only, when the ship is en route, etc.). Conversely, in special zones, a stricter system that may extend as far as the prohibition (for example, in the Antarctic) of all waste is provided for. This regulation of waste makes it compulsory for nations to have land-based facilities in their ports to receive what has not been able to be disposed of, in compliance with international law.

42 These SZs have been proposed for the IMO's decision by a coastal state or states for one and/or other MARPOL appendices; examples of this are the Mediterranean for appendices I and V; the Antarctic for appendices I, II and V; and the North Sea for appendices I, V and VI (SOx).

43 As in the case of the double-hull rule or that of ballasts in defensive locations, for example, as provided for by appendix I in order to minimize the consequences of an accident in terms of pollution, or waste regulations in the context of operational pollution – *infra*.

44 Also considered in article 218 of UNCLOS.

45 Since European Community directive 95/21/EC of June 15, 1995, subsequently reviewed.

46 The convention actually specifies the conditions of lawfulness of waste and the obligations relative to this waste in terms of the construction, design, and fitting out of ships, chemical tankers, oil tankers, etc. Though oil tankers and chemical tankers can still emit waste in the hypothetical event that this is necessary for the safety of the ship or its passengers or when this waste is part of anti-pollution measures, it is usually prohibited barring provisions to the contrary. For hydrocarbons, for example, appendix I specifies that, outside special zones in which all waste is prohibited except for separated ballast, waste disposal is possible under certain cumulative conditions such as: if the ship is en route, if this waste does not exceed a certain effluent level (15 PPM), an automatic waste disposal stoppage system must be in place, and finally if the ship is at a certain distance from the coast (that is from the baselines), normally at more than 50 nautical miles from the nearest coast. The depth of the water is also taken into account when dealing with chemical tankers as

provided for by appendix II, for example. However, the drastic system imposed in SZs has a flip side; it can only be applied in a zone for which it is specified if ports have facilities to receive wastewater from hold waters, cargo hold cleaning waters, etc. If this is not the case, the "general" system is applicable.

47 See in France, provisions relative to this aspect principally contained within the environmental code.

48 See, for example, the case of the *Transarctic*, a Norwegian ship that disposed of hydrocarbons in the French EEZ in 2005 [LEM 06].

49 For example, the *Vytautas*, a Lithuanian ship involved in illegal waste disposal in the Atlantic, was punished by its home country by a fine of 22,634 euros, though in this case the Brest Tribunal had handed down a fine of 700,000 euros in the first instance. The appellate court of Rennes was, therefore, obliged on January 20, 2011 to pronounce the discontinuation of legal proceedings before the French courts for this case, causing certain parties to denounce this action as "when Lithuania overwrote the prices". Position of the Court of Appeal on this point in accordance with article 228 of UNCLOS: Court of Appeal, Ch. Crim. May 5, 2009, 2 copies, Bull. crim. 2009, no. 85.

50 See the IMO's 2012 contribution to the Rio + 20 Summit and relative to the Concept of a sustainable maritime transportation system.

51 In French, "*du berceau au tombeau*".

52 See, for example, the provisions of European Union law relative to the recycling of ships, *infra*.

53 See the case of oysters in France, of Portuguese origin, subsequently decimated and replaced by oysters of Japanese origin in the 1970s.

54 When freshwater species were found in the Saint Lawrence seaway in Canada, Japanese starfish in Australian waters or European green crabs in South Africa; but, these waters also carried viruses such as cholera and micro-organisms harmful to human health such as *Alexandrium* from the Chesapeake Bay, a microalgae toxic to humans that infested mussels in the 1990s in the waters off Côtes-d'Armor in France (see [LET 11]).

55 Specified in November 1993 by General Assembly Resolution A 774 (18) and then in 1997 by Resolution A 868 (20).

56 See, for example, the new American regulations on the subject, called the Vessel General Permit (VGP), effective date December 20, 2013 [LEM 14].

57 See in particular the studies conducted on shellfish in the Arcachon basin in France, for example.

58 For more information on lifecycle analysis, see [VOI 14].

59 Adopted by Resolution A 962 (23) and modified in particular by the 2005 IMO resolution A 980 (24).

60 See on this subject the tribulations of the French ship *Clémenceau* [LET 09].

61 (EU) regulation no. 1257/2013 of the European Parliament and Council of November 20, 2013 relative to the recycling of ships and modifying (EC) regulation no. 1013/2006 and directive 2009/16/CE, JOUE no. L 330 of 12/10/2013, p. 0001-0020.

62 See the ORSEC MER (POLMAR) plan in France, reviewed by the civil safety modernization law of August 13, 2004.

63 As in the case, for example, of the "UNEP conventions on regional seas", all of which contain an article concerning information and cooperation in the event of a critical situation in the maritime zone concerned and are supplemented by a protocol for counter-measures in the event of a critical situation, such as in the Mediterranean, called since its 2002 version the "Prevention and critical situations" protocol, as well as for east Africa and the regions of the Caribbean and the Persian Gulf.

64 The exact title of which is the "International convention on intervention on the high seas in the event of an accident causing or liable to cause pollution by hydrocarbons", IMO, Brussels, November 29, 1969.

65 See the landmark case of the *Erika* disaster, where criminal proceedings took place, but with the constitution of civil parties.

66 In 2001, the IMO also developed the convention on civil responsibility for pollution-related damages caused by hold hydrocarbons. This convention went into effect on November 21, 2008; it will not be discussed here.

67 This perspective may be used to approach the wide-ranging interest in green-algae pollution, due more to its visibility than to its danger (which is not being called into question) for the marine environment.

68 Chemical compound used in manufacturing plastics, notably polystyrene (Styrofoam). This chemical substance is not considered very dangerous for the environment, since it does not bioaccumulate greatly or persist to a great extent in the natural environment. Though it is toxic, styrene is not listed among the most toxic products by the IMO (product category Y according to MARPOL's nomenclature).

69 In reality, after the ship's sinking, virtually all of the products were able to be pumped without spilling into the environment. The low danger of the main product present on board, combined with the small quantities released into the sea, prevented serious chemical pollution in the English Channel.

70 Intoxication, for example.

71 A ship stuck in oil in a port, for example.

72 Fishing, tourism and hotels, etc. affected for example.

73 Meaning able to be “billed for”, even if they are moral.

74 The question of their directness has been problematic at times. FIPOL refuses payment for so-called “second-degree” damage, as it did in the case of the *Erika* disaster, for example, which involved the request by the owners of a commercial site at Belle-Ile at sea, for the cancelation by the lessee of the rent for this site for the year 2000 (the Lebaupain affair), as in other cases of patrimonial damage caused to shellfish merchants geographically located too far from the site of the catastrophe (the *Sea Empress* disaster off the coast of Wales in 1996, for example).

75 See the compensation manual developed by FIPOL on this point.

76 See its reparation of a symbolic franc in the so-called “red mud” affair following the sinking off the Corsican coast of substances by the Italian company Montedison, TGI Bastia 8 December 1976, *Prud’homie des pêcheurs*, Dalloz, 1977, 427, note M. Remond-Gouilloud.

77 Sometimes by application of fixed formulas, as in the case of an event polluting the Baltic Sea in 1979, in which the solution of the Tribunal of Riga regarding reparations for ecological damage set at one ruble per m^3 of polluted seawater, while the criminal court of Toulon refused in the 1980s to pay for ecological damage caused by illegal sea urchin fishing in the national park of Port Cros on the basis of market prices, with the judge declaring that “sea urchins provide a more important ecological service in the event” than the one paid for on this type of economic basis.

78 This “reasonable” character has been the subject of an assessment by FIPOL operating under the theory that cleaning and restoration efforts sometimes create more damage than they repair (the “How Clean is Clean?” theory). It is sometimes asserted, as part of the still highly esteemed theory of assimilative capacity regarding the marine environment, that there is a reason to let nature take its course and “do its own work powerfully,” as decreed by the judgment in the case of a black tide in a mangrove swamp in Puerto Rico, United States, in 1973, caused by the oil tanker *Zoe Colocotroni* (D. 1982 Chron. 33 M. Rémond-Gouilloud), and that cleanup efforts may create more damage than self-reconstitution, and that they may thus constitute an “unreasonable” conservation measure, which is, therefore, not compensable.

79 Or even gamble on an evolution of “jurisprudence” with regard to FIPOL: see the Grenelle of the Sea, “Mission FIPOL” 2010, a theory not refuted by the secretary-general of this fund.

80 Cour de Cass. Ch. Crim. 25 September 2012 no. 3439 on the *Erika*, in which certain parties were recognized as compensable victims of this environmental damage, including some

environmental protection organizations affected in their *animum societatis* – see [KEL 08] – and affected coastal regional authorities (departments and municipalities); for the decision of the court of appeal, see [DEB 13].

81 See, for example, the convention on limitation of responsibility for owners of ships of October 10, 1957 – a theoretically controversial system of limitation in modern times; see *infra*.

82 It will fall to the latter, if necessary, to take recourse action against any possible responsible parties to blame for the pollution.

83 The CLC limit is 4.51 million SDR, or approximately 5 million euros. This limit does not apply in the case of inexcusable transgression by the owner; see *infra* on this point.

84 States receiving a certain quantity of hydrocarbons by sea and which often, via taxation (for example, TIPP) put together this contribution from large quantities of oil imported by ship by oil companies into their territory.

85 The FIPOL 1992 limit and the CLC limit equal 203 million SDR, or 228 million euros. Only 85% of some 7,000 requests for compensation for damages caused by the *Erika* have been paid under these terms, for example, with France prioritizing individuals and regional authorities in the matter of reparations.

86 Which can also be directly and solely solicited if the shipowner cannot be found or is insolvent.

87 It should be noted that while limitation of responsibility for maritime operators is a traditional provision in maritime law, its continued existence is highly controversial, both in matters touching pollution and in other maritime claims. In fact, doctrine increasingly advocates the elimination of this concept of limitation, and of the difficulty of making it non-applicable to an incident. Thus, with regard to the CLC, this limitation cannot be actionable in the case of inexcusable fault (difficult to prove), and it is often suggested that this exception be changed due to the fact that simple fault would make the limitation non-applicable and would then require full reparation for damages. See, for example, the "Mission FIPOL" proposal from the 2010 Grenelle of the Sea (p. 8) relying on the jurisprudence of the European Court of Justice, also used by the Court of Appeal of the municipality of Mesquer in its decree of September 17, 2008.

88 For "special drawing rights," which is the international currency used by the International Monetary Fund (IMF) defined on the basis of several currencies.

89 Which approaches the full assessed amount of the damages caused by the black tide from the *Prestige*.

90 IMO strategic plan for 2014–2019, Res. A/1060 (28) of January 27, 2014.