

ENVIRONMENTAL LEGISLATION CONCERNED WITH OFFSHORE PLATFORM DISCHARGES

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ABSTRACT

Legislation concerning offshore platform discharges seeks a balance between technical feasibility and economic costs by establishing agreements throughout history. Different considerations have been brought into focus since the first Convention for the Prevention of Pollution of the Sea to the North Sea Conferences. Some of these have addressed, more successfully than others, the environmental legislation concerned with offshore platform discharges. On the other hand, others had considered it in a mediocre way. Illustrations for both cases are presented in this paper.

The introduction of the revolutionary oil and gas industry has led to offshore platform discharges and treatment problems. Produced water represent a big concern amongst this issue, as commonly expected water percentage could be as high as 60 and 70%, or even more. Importance derives from its definition as it involves many processes which, if not properly handle, would be detrimental to the environment. Produced water is a complex mixture of naturally occurring water from the reservoir, and injected water, dissolved salts, trace and heavy metals, solid particles from reservoir sand, deposited scales, and minerals both inorganic and organic. Moreover, it includes residues of different chemicals used elsewhere in an oil field: demulsifiers, corrosion and scale inhibitors, polyelectrolytes, methanol, glycols, used deposition inhibitors, defoamers, biocides, oxygen scavengers, deoilers, flocculating and dispersing agents, diluents, and cleaning agents.

The oil and gas industry are probably addressing problems related to offshore platform discharges more in terms of technical feasibility and economic costs than in terms of environmental impacts associated with them. Legislation, then, seeks a balance between these fundamental issues by establishing different formal agreements among states and recognised institutions around the world. These agreements, which applied to oil and gas activities, are governed by three mechanisms of the international law:

- Treaties, including conventions, agreements, and protocols;
- Customary international law; and
- Common general principles of law.

Law, both customary international and common general principles, creates many obstacles in the characterisation of environmental matters. International law has also defined four categories of discharges associated directly with offshore oil and gas activities:

- Platform drainage;
- Offshore processing drainage;
- Displacement discharge; and
- Production water discharge.

These legal distinctions made in offshore platform discharges are illustrated in Figure 1.

The first of those international laws was the *International Convention for the Prevention of Pollution of the Sea* (OILPOL 1954, London, which entered into force in 1958). This Convention only considered control of oily water discharges from general shipping and oil tankers. It also introduced the term nearest land from the baseline from which the territorial sea of the territory in question is established in accordance with the Geneva Convention on the Territorial Sea and the Contiguous Zone. Some other considerations included oil and oil mixtures, water ballast, oil loading terminals, and recording books.

The Convention on the High Seas (Geneva 1958, which entered into force in 1962) basically referred to high seas as parts of the sea that are not included in the territorial sea or in the internal waters of a state. High seas did not imply any physical separation by any frontiers or borders rather than imaginary lines after territorial seas. This Convention considered issues such as freedom of navigation, fishing, laying submarine cables and pipelines, and flying over the high seas. Although this Convention drew regulations concerning discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the seabed and its subsoil, it gave more emphasis to ships and aircrafts. Its considerations of pollution prevention were quite vague, as nor detailed quantification for especial activities neither products were mentioned.

By the same time to the Convention of the High Seas, the *Convention on the Continental Shelf*, was hold. Under its perspective, the continental shelf sovereign rights included exploration and exploitation of natural resources –mineral and

other non-living resources of the seabed and subsoil together with living organisms belonging to sedentary species- by the coastal state. This Convention also introduced the concept of setting up limits by the establishment of safety zones around any installations (about 500 metres), constructed for exploration or exploitation of natural resources. However, this Convention did not make any fundamental advances for environmental pollution protection.

The Convention for the International Council for the Exploration of the Sea (Copenhagen, 1964), agreed to promote and encourage research and investigation for living resources in the Atlantic Ocean and its adjacent seas, primarily in the South Atlantic. Nevertheless, pollution was not taken into account under its considerations.

The Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil (Bonn, 1969) was signed by Belgium, Denmark, France, Germany, Netherlands, Norway, Sweden, and the United Kingdom. They recognised the grave pollution of the sea by the “prospective presence of oil” in the North Sea area. However, this agreement was just a delimitation of the area in consideration. Other harmful substances were also considered in 1983 as an addition to this Agreement. By this time, The European Economic Community participated in it. Although they gave guidelines for the practical, operational and technical aspects of joint action regarding pollution, they did not take into account continuous disposal of oil or other harmful substances. It was perhaps the era of being concerned with major pollution incidents, rather than continuous disposal into the environment; as the former one has great impacts over public in general.

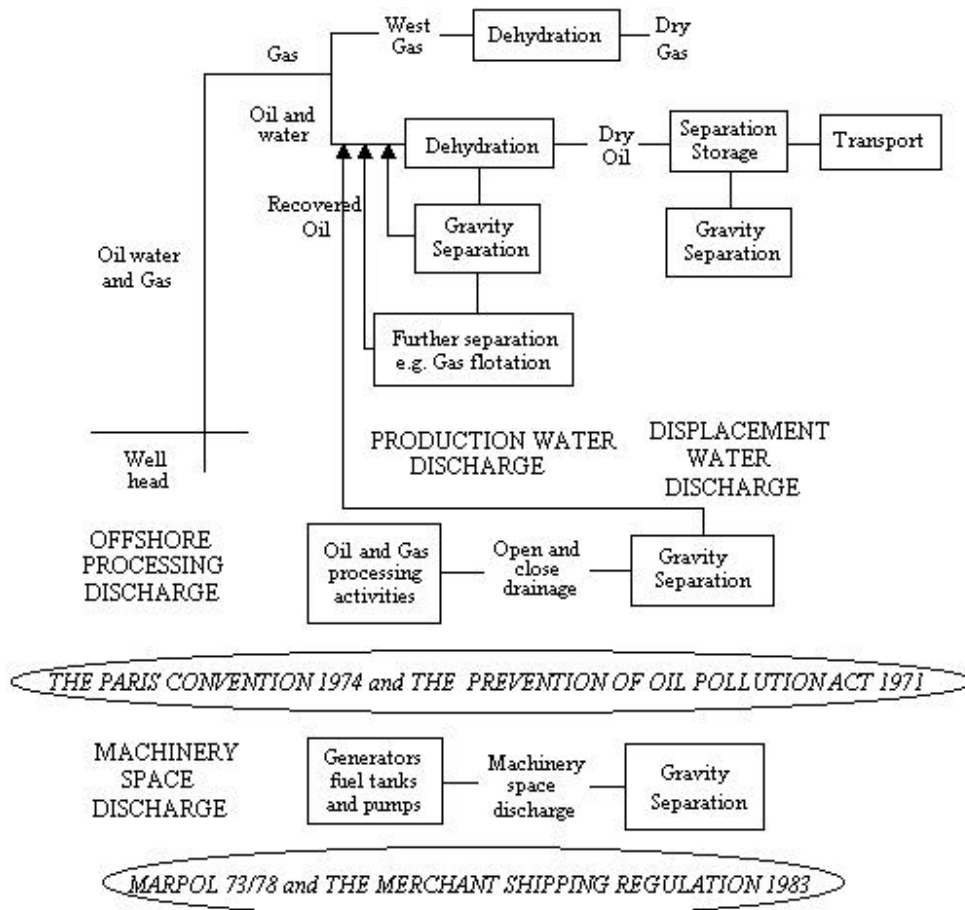


Figure 1. Offshore Platform Discharges –Some examples of the distinction made by law-

One of the main concerns of the emerging *International Convention on Civil Liability for Oil Pollution Damage* (Brussels, 1969) was the dangers of pollution posed by the worldwide maritime carriage of oil in bulk (including crude, fuel, heavy diesel, lubricating, and whale oil). They also considered monetary compensation to people who suffer damage caused by pollution resulting from the escape or discharge of oil from ships. It was also stated the creation of an international fund, which then was foreseen as the *International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage in 1971*. The protocol to amend this convention was done in London, 1984.

In September 1971, the Governments of Norway, Denmark, Finland and Sweden established the *Agreement Concerning Cooperation in Taking Measures Against Pollution of the Sea by Oil*. They decided to co-operate in any significant pollution of the sea by oil, which threatens the coasts or related interests. They proposed gathering information concerning any significant oil slick by investigating their characteristics (quantity or extent, position, direction of movement and speed). Not any other remarkable considerations regarding pollution from platforms or ships were taken into account under this agreement.

One of the first approaches to a more comprehensible offshore platform discharges was done by the *Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft in 1972*. For the purpose of this Convention, fixed or floating platforms are considered under the definition of ships and aircraft. This Convention considered substances included: organ halogen and organ silicon compounds, carcinogenic, mercury, cadmium, persistent plastics and other persistent synthetic materials which may float or remain in suspension in the sea. This Convention also mentioned other substances as special ones, such as: arsenic, lead, copper, zinc, cyanides, and fluorides, and pesticides, containers, scrap metal, tar-like substances, etc.

They also encouraged research and alternative methods of disposal. They pledged themselves to promote, within the competent specialized agencies and other international bodies, measures concerning the protection of the marine environment against pollution caused by oil and oil wastes, other noxious or hazardous cargoes, and radioactive materials. Some provisions were also given by governing the issue of permits and approvals for the dumping of wastes at sea. This includes characterisation of waste (toxicity, persistence, accumulation, etc), characteristics of dumping site and method of deposit, and general considerations and conditions.

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), subsequently amended by a Protocol in 1978, took into account discharges of harmful substances from ships, as one of the integrated international laws concerned with offshore management disposal. The signatory

parties agreed to promote assistance and coordination with UNEP and technical support, and report on incidents involving harmful substances.

Some of the annexes included in this Convention are as follow:

- Annex I: Regulations for the prevention of pollution by oil
- Annex II: Regulations for the control of pollution by noxious liquid in bulk
- Annex III: Regulations for the prevention of pollution by harmful substances carried by sea in packaged forms or in freight containers, portable tanks or road and rail tank wagons
- Annex IV: Regulations for the prevention of pollution by sewage from ships
- Annex V: Regulations for the prevention of pollution by garbage from ships.

Although ideas regarding oil discharges monitoring and control system and oily water separating equipment were included in this convention, they did not go further in details, as those ideas seem to be only concerned with oil in water content, and visible traces of oil when observed.

The Convention considered instantaneous discharges of oil content for normal ship moving from one place to the other, and oil content of effluents of ballast water not exceeding 15 parts per million in areas of the Mediterranean Sea, the Baltic Sea, the Black Sea and the Red Sea area (designated as special areas).

Annex I, Chapter II, Regulation 21 described some special requirements for drilling and other platforms. This should be applied to ships of 400 tons gross tonnage and above other than oil tankers, where a record should then be kept (description of all operations involving oil or oily mixture discharges in any special area). Annex I also included a list of which includes asphalt solutions, blending stocks, oils, crude oil, mixtures containing crude oil, diesel oil, fuel oils, road oil, transformer oil, mineral oil, motor oil, penetrating oil, distillates, gas oil, gasoline blending stocks, jet fuels, turbo fuel, kerosene, naphtha, and others.

The Convention for the Prevention of Marine Pollution from Land-Based Sources (The Paris Convention, 1974) came into the environmental law playground by adding important considerations regarding offshore platform discharges, which was amended by the Protocol in 1986.

Participants in the Conference included Austria, Belgium, Denmark, France, Federal Republic of Germany, Iceland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom (Finland and Italy acted as observers).

The Paris Convention was concerned both with maritime and freshwater limits in high seas, territorial seas, and waters on the landward side. It established major discharge controls from offshore installations (man-made structures) in the North East Atlantic area, including the North Sea, Irish Sea English Channel and Arctic Oceans, but excluding the Baltic Sea and Mediterranean Sea areas. The Convention also classified substances used in those installations into black and grey lists, and a category for radioactive substances, according to toxicity, bio-accumulation and persistence in the environment. The black list considers persistent oils and oils of petroleum origin, and mercury and cadmium compounds. The grey list considers non-persistent counterparts, arsenic, lead, chromium, nickel, copper and zinc.

The main role of the Paris Convention has been throughout its governing body, known as PARCOM or The Paris Commission. Together with its Working Group on Oil Pollution (GOP), they have encouraged contracting parties to take actions to reduce discharges of oil from offshore installations.

Suggestions have been made in order to implement the Best Practicable Means for separating oil from discharged water in new offshore installations, so that, reducing the average oil content to between 30-50 mg/l. The Commission also adopted a provisional target standard of 40 mg/l of oil for discharges from offshore installations. However, it took PARCOM two years to realise that the provisional target would be outside the bounds of current equipment, so that, it was not possible to adopt it as a definitive target.

During the Eighth Meeting in 1986 PARCOM recommended again to Contracting Parties a target standard of 40 mg/l hydrocarbons concentration (average). However, it was only during the Tenth Meeting that one of the most important action was taken, as they agreed that the standard should be applied to all offshore installations. A formal consent to this recommendation included the Best Available Technology (BAT) used for the reduction.

In an international scale, *The United Nations Convention on the Law Sea 1982* established a new and comprehensive legal regime dealing with all matters related to the law of the sea, including platforms and other man-made structures at sea. However, this Convention did not give any emphasis to management offshore, and only instructed states to adopt laws and regulations. The Convention also suggested measures to prevent, reduce, and control pollution of discharge of oil, oily wastes and other noxious substances into the marine environment by co-operation on an international and regional scale. As far as it could be seen, the Convention was more a code of conduct than a truly convention for pollution by only considering topics of navigation in different areas, economic zones, technical assistance, enforcement, monitoring and environmental assessment.

The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region was established in 1983. It took into account economic and social values of the marine environment by including considerations of coastal areas of the Caribbean region. At first instance, this Convention was concerned with prevention, reduction and control of pollution. A first approach to this was done by considering pollution cause by dumping from man-made structures, and pollution resulting directly or indirectly from exploration and exploitation of the sea-bed and its subsoil.

Then the *Protocol Concerning Co-Operation in Combating Oil Spills in the Wider Caribbean Region* was signed by the same time. Again the era of oil spill incidents were brought into focus by taking into account only this aspect. Moreover, integrated marine planning and management for The Cartagena Convention rather seldom dealt with oil exploration, as "such marine activities are often conflicting each other and they are mostly managed on a sectoral basis". All parties agreed to establish close co-operation with the International Maritime Organisation (IMO), UNEP, and other appropriated entities. Another initiative was the support to ratification and implementation of MARPOL (including considerations for being a "special area").

As a reaction to many of these international agreements and conventions, which were heavily criticised, a new option emerged in 1984: *The North Sea Conferences*. Governments bordering the sea area organised and participated in the Conference. This was done not as a response to a particular pollution incident or identifiable set of circumstances serving to show the inadequacy of existing environmental controls, but rather as a response to growing and more evenly spread public and pressure group concern over numerous aspects of marine pollution and the general health of the marine environment.

During The Second North Sea Conference, ministers agreed to encourage PARCOM to continue its work by the improvement of monitoring programmes, introduction of more effective technologies, and the strengthening of standards based on "the principle of precautionary action". They also initiated action within IMO for designating the North Sea a Special Area for the purpose of Annex V.

In the Third International Conference for the Protection of The North Sea (March 1990) it was requested a reduction in discharge levels to 30 mg/l. However, the Paris Commission decided that 40 mg/l still was most appropriate standard. It was further agreed to exercise greater control over the activities of the offshore industry.

For the Fourth Conference, they reaffirmed the commitments made in preceding conferences. They also committed to reduce discharges, emissions and losses of hazardous substances as much as possible.

At the end, some efforts from different governments have attempted to classify substance according to the maximum amount that can be expected not to cause adverse environmental effects if lost or discharged to the sea. However, it is very difficult, almost impossible, to predict other adverse effects when so many diverse chemicals added to the oil, water and gas stream in offshore platforms, may form chemical cocktails of active ingredients. Moreover once chemicals have been injected into a particular stream, little is known amongst other processes, levels of discharge, and finally the degree of environmental impact of such discharges.

The general idea of classifying water discharges associated directly with offshore oil and gas activities into four categories have enabled to apply different standards to every type of discharges. However, this idea is quite difficult to put into practice. In addition, more and more lobby groups have successfully achieved exemption to regulations. On the other hand, the approach has permitted flexibility in the law by the introduction of new standards without bureaucratic procedures. Political persuasion, constantly changing with time, has also led to a very murky situation concerned with establishing standards for the environmental management offshore.

In spite of many encountered difficulties, it seems that PARCOM is moving towards future scenarios: a possible reduction in the regulatory limits of the average hydrocarbons concentration, implemented by using BAT, and the development and adoption of a harmonised mandatory system for the use and discharge of chemicals routinely employed offshore by the oil and gas industry.

Current debate in international law also suggests that the technological capability or Best Available Technology approach will continue to provide an important element of future environmental legislation. Future discharge control would also involve CHARM (Chemical Hazard Assessment and Risk Management), which attempt to assess hazard and risk with the use of chemicals offshore.

"Do the best we can do " seem like a sensible approach to treat various produced water free oil discharge levels. Regulation has implicitly suggested this mediocre way of solving environmental problems by focusing attention on levels of dispersed oil discharges rather than in aliphatic and aromatic soluble hydrocarbon fractions, organic acids, and heavy metals. A reason to do so is because free oil can be easily measured and treated, in spite of subtle long effects in the environment.

Actual technologies to reduce discharge levels from 40 mg/l down to 30 mg/l or even more do exist; but doing so would not mean a reduction in dissolved oils, specially aromatic levels and organic acids. Aromatic hydrocarbons (benzene, toluene, ethylbenzene) are usually described as "sparingly soluble" and in some waters will certainly exceed 40 mg/l. Organic acid (volatile

fatty acids) are soluble in water, and may be present as several hundred mg/l of dissolved material. It is more likely that significant reduction in oil in water content may be achieved by using chemicals to break emulsions or enhance droplet coalescence; which then would lead to increase significantly additional environmental impacts.

Today, it seems that offshore platform discharge management has been targeted within different frameworks: legislation, Best Available Technology, and environmental effects considerations. Some of these frameworks have gained more popularity than others, especially the technological aspect together with regulatory systems of imposing standard. New conventions, agreements, and other mechanism of international law may be foreseen in a future not too far, but still remain the question of addressing environmental issues with the best approach to a more detailed and strict environmental legislation regarding offshore platform discharges.

CONCLUSION

Three different mechanisms of the international law have been addressing offshore platform discharges for about sixty years. Since the first International Convention for the Prevention of the Sea 1954, passing through the Convention on the High Seas, the International Convention on Civil Liability for Oil Pollution Damage, MARPOL 73/78, the Paris Convention, and to the North Sea Conferences.

Lack of strict environmental legislation has been shown in all these mechanisms, spite good efforts of some of them to include new concepts by leaving behind an era of only considerations for pollution incidents.

Nevertheless, much more has to be done by taking into account integrated frameworks for reduction of dissolved oils, and a harmonised adoption of a system where discharges of all chemicals and further effects on the environment for offshore platform discharges are considered.