Marine pollution prevention and contingency planning

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MARINE POLLUTION PREVENTION AND CONTINGENCY PLANNING FOR THE REPUBLIC OF CAMEROON

BY

NSAHLAI NSAMBU ATHANASIUS

A Paper submitted to the World Maritime University as part of the requirements for a Master of Science Degree on General Maritime Administration.

The contents of this Paper reflect the writer's personal views and are not necessarily endorsed by the World Maritime University or the International Maritime Organisation.

Signature: 

Date: May 28, 1985

Paper supervised by:
Professor Gunnar Stubberud
The World Maritime University
i) JUSTIFICATION:

Some twenty years ago the Cameroonian Marine environment was virtually free from marine pollution. This explains more or less why the Merchant Shipping Code promulgated in 1962 failed to regulate marine pollution.

In the late seventies when oil production commenced, transportation activities had significantly increased. With the additional traffic generated by Oil marine pollution ceased to be a distant problem as cases of oil spills within the territorial waters became more and more frequent.

This trend of events led to Government reaction resulting in a number of studies based essentially on environmental protection and marine pollution control carried out by experts from IMO and UNEP. Their findings though vitally important were more or less general, leaving a number of fundamental but crucial questions unanswered. It goes without saying, however, that those early studies are the basis for the present and future researches in this particular field.

In spite of the precited studies intended to alert the Government on the deteriorating situation, nothing much has been done. The Merchant Shipping Code is still silent on marine pollution and the organisational structure of the Merchant shipping Department still needs restructuring if marine pollution control must be given due attention.

In order to rouse the competent authorities from this slumber that has stemmed more or less from a lack of adequate information and facts about marine pollution and its impact on the society, I undertook to produce this comprehensive piece of work covering on the one hand the preventive and combative aspects of marine pollution and on the other hand the possible social and economic impacts of such pollution on the Cameroonian society.
Moreover, the unique feature of this project appears to be its global and complete approach to marine pollution control. The project attempts to answer amongst others, the following questions:

- What is marine pollution?
- What is marine pollution from ships?
- What is the global reaction to marine pollution?
- Why would marine pollution be considered a threat to the Republic of Cameroon?
- What measures could the Government of Cameroon adopt in order to effectively control marine pollution within her marine environment?
ii) SCOPE

The present work mainly focuses on marine pollution prevention and contingency planning. It does not, however, pretend or attempt to answer all questions arising from marine pollution from ships. It does nevertheless touch on most of the fundamental issues arising from or relating to marine pollution.

Attempts have been made to view the subject first globally and then nationally. In the latter case the prevailing situation in Cameroon has been portrayed and closely examined.

Considering the complexity and the interdisciplinary nature of the subject under discussion as well as the desire to give a more complete picture of the subject, it has not been possible to enter technical details. However, care has been taken to introduce the most important systems and to explain briefly their functions and application.

By and large, this project must be considered as the first major step into research on marine pollution control for the Republic of Cameroon. It simply opens the way for further research into the field. Much is left to be done!
iii) GENERAL BACKGROUND:

The present work has drawn from a reservoir of knowledge accumulated from a wide range of sources some of which are hereunder enumerated:


2. Expertise knowledge from the professors at the World Maritime University.

3. Research interviews with competent officials in Cameroon. This included officials from the National Ports Authority, M.A.B., the National Refinery (SONARA), Oil Companies (ELF SEREPCA, PECTEN, TEPCAM, MOBIL, GULF OIL), Petroleum Depot Company (SCDP), MIDEPECAM, Fishing Companies (CRECAM, CHALUTCAM, COTONNEC, and PECAM/COPEMAR), etc.

4. Writer's several years of experience as employee and Deputy Head of Service for the Safety Service at the Merchant Shipping Department.

5. Knowledge gained through field trips and on-the-job training courses that enabled the writer to come in contact with Government and private shipping organizations in some of the renown maritime nations of the world (Sweden, UK, Norway, Denmark, Holland, Poland, Canada) during his two years of studies at the World Maritime University.
iv) GENERAL PLAN:

The following is the general outline of the plan adopted for this project.

- Preliminaries
- Introduction
- Chapter I : Marine Pollution from Ships.
- Chapter II : Marine Pollution and International Organisations.
- Chapter III : Marine Pollution as a Matter of Great Concern for Cameroon.
- Chapter IV : Key Measures against Marine Pollution -
  Part I : A Good Maritime Administration.
  Part II : Ratification and Implementation of Pollution Conventions.
  Part III : Contingency Planning.
- General Conclusion
- General Recommendations
- Footnotes
- Bibliography
- Appendices
v) ACKNOWLEDGEMENT:

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- Mr. Guikoume Michael, Marine Superintendent (SONARA) Limbe
- Mr. Paul Camasses, Head of Security Service (SONARA), Limbe
- Mr. Daniel Revolier Jean, Head of Security Service (ELF-SEREPCA), Cameroon
- Mr. Jean Pierre Delos, Production Manager (TEPCAM); Cameroon
- Mr. Vinazza (TEPCAM), Cameroon
- Mr. Youmba Josue (Department of Merchant Shipping), Douala
- Mr. Tani Emmanuel, Engineer (TRACTAFRIC), Douala
Finally, I would wish to record my deep appreciation and thanks to my dear wife, Mme NSAH LAI Winifred, for her encouragement and material assistance.

Although great effort has been exercised to ensure the accuracy of information, some errors or omissions may have escaped notice. Responsibility for such mistakes, all the facts quoted, all the opinions expressed, and all the proposals or recommendations made, is mine, and mine alone.
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1.1 **MARINE ENVIRONMENT, A DUMPING GROUND**

From time immemorial, the marine environment has served as a universal recipient or dumping ground for matter in its various forms hereunder enlisted:

1.1.1 **GAS:**

The atmosphere holds numerous gases most of which are harmful as a result of their high toxicity. The gases originate from several sources amongst which the following:- decomposed matter on the Earth surface; the burning of organic materials on land and the combustion of oils and liquefied gases in the industries and locomotive engines, volcanic actions, etcetera. Most of the gases are continuously being dissolved by rain and conveyed to the oceans by streams, rivers, etcetera, causing serious contamination to the marine environment.

1.1.2 **LIQUID:**

Liquids and liquid wastes composed mainly of urban runoff, river runoff, municipal wastes, industrial wastes, refinery effluents, spills from the transportation of oil, chemical substances and liquefied gases, spills from offshore production, etcetera, are among the most hazardous liquid substances that have year after year been discharged into the marine environment.

1.1.3 **SOLID:**

Debris, garbage, logs, timber, rocks, amongst others, are solid substances that get into the marine environment either naturally or through human effort and could be a serious threat to navigation.

It came about as a result of the rapid deterioration in quality of the marine environment owing to high contaminant concentrations particularly in the enclosed areas, the last few decades, that many
environmentalists questioned and even challenged the old belief that the sea was a vast recipient of wastes with an unlimited capacity. There is, however, no doubt that if such a belief were allowed to continue unchallenged, man and the entire ecosystem would be heading for a serious disaster. This has been evidenced by recent studies carried out on the marine environment.

1.2 POPULATION GROWTH:

Nevertheless, the root cause for the ever-increasing contaminant concentrations in the marine environment particularly the last few decades has been undoubtedly what may be termed population explosion resulting in a tremendous increase in the rate of utilization of the marine environment and in the amount of pollutants discharged into it each day.

The world has experienced these recent years what demographers view as population explosion. Science has made to believe that this is due mainly to better conditions of living resulting from improved diets.

Notwithstanding the foregoing, population growth rate however high still falls short of forecasts made by ancient Chinese and Italian demographers, forecasts that called for and justify Malthus's preventive and positive checks, more or less in force today, serving as a counter measure to population explosion. "Preventive checks" are deliberate policies aimed at keeping population growth within reasonable limits, and "positive checks" are in the form of devastating wars, famine, and plague.

Despite these "checks", the world population has maintained a steady and rapid growth. Considering the last three decades, for instance, the world population has grown considerably from 3037.48 million in 1960 through 3704.30 million in 1970 to 4419.45 million people in 1980.
The 1995 forecast by the same source is 5661.50 million people. The present growth rate is 1.7 percent. (1)+

Another source even quoted the United Nations (U.N) as estimating the present world population at 4.76 billion and a possible 6.13 billions rise by the year 2000 and a 10.2 billion around the year 2100. (2)+

For several reasons, different sources may, as it were, present different figures and forecasts on world population as is the case above but the truth remains, however, that there is rapid growth signifying an ever-increasing demand for basic needs such as food, shelter, efficient communication systems, adequate health services, sound education systems, more efficient transport systems, and increased trade, just to mention a few, for sustainance of such a population. Modern technology, industrialization and the exploitation of the marine environment are indispensable if the precited needs must be met.

1.3 Moreover, the world today is more than ever dependent on the marine environment for most of its needs viz recreation, food (fisheries), non-living resources (minerals, natural gas and petroleum), and transportation.

1.3.1 THE ROLE OF WATER AS A MEDIUM OF TRANSPORT:

The very vital role of water as a medium of transport has been evidenced the last three decades or so by the rapid growth in the fleet size, fleet composition, ship size and the increased world tonnage, all of which are indicative of the tremendous increase in activities within the marine environment.

1.3.2 DANGER FROM MARINE POLLUTION:

The growth in the world fleet has certainly facilitated the movement of goods and passengers by sea but it has equally heightened the safety problems and the danger to the quality of the marine environment by nearly the same degree.
This in fact, is obvious considering that while the world fleet has witnessed a rapid growth, the volume of water in the oceans is more or less the same.

1.3.3 POLLUTION FROM SHIPS:

Moreover, experience has shown that the main danger to the marine environment comes from ships particularly those that transport oil, noxious liquid substances, and chemical substances.

1.3.4 OIL POLLUTION:

It is evident that oil is not necessarily the most dangerous substance carried by sea but it is without doubt the most important in terms of tonnage. Some of the major sources of oil pollution include oil drilling, production, transfers, refinery and transportation, all of which could lead to spills of varying sizes.

1.4 GLOBAL CONCERN FOR MARINE POLLUTION:

Faced with the imminent danger from pollution in general and marine pollution in particular threatening man and his environment, the U N resorted to the creation of technical organs such as the International Maritime Organisation (IMO), United Nations Environment Programmes (UNEP), Food and Agricultural Organisation (FAO), World Health Organisation (WHO), World Meteorological Organisation (WMO), and the United Nations Development Programmes (UNDP) whose tasks include amongst others environmental care (sea, land and atmosphere). The task of environmental care has been carried out by the UN and her technical organs through technical assistance programmes, technical co-operation and the adoption of the Law of the Sea Convention and instruments dealing with environmental care and prevention of same from pollution.

In the like manner, the shipping industry which in the present context encompasses all organs of the private sector engaged in shipping, has contributed substantially to the fight against pollution.
1.5 CAMEROON VIS-A-VIS MARINE POLLUTION:

The Republic of Cameroon, a maritime nation in the making, located along the Atlantic coast of the African continent, deep in the Gulf of Guinea, has a coastline measuring some 475 Km and transports 90 percent of her foreign trade by sea. At the same time, the port of Douala/Bonaberi which is her main sea port serves as a gateway for landlocked neighbouring countries of Tchad and the Central African Republic. Cameroon's population estimated at 8.6 million people (1983 census) has a growth rate of 2.3 percent. The country has witnessed the last two decades a rapid growth in the volume of her foreign trade and in the size of her sea-going fleet. The number of foreign vessels that call in the Cameroonian ports has also increased immensely these recent years.

These developments coupled with the nation's geographic location; oil production, oil refinery and oil transfers and transportation as well as the economic impact, amongst others, place Cameroon in the group of nations actually faced with the danger emanating from marine pollution.

The consequences of a major spill in the Cameroonian waters can only be roughly estimated if one were to imagine the short and long term effects on marine life particularly the fisheries, the effect on the coastal population that depends wholly or partially on such food resources for livelihood, and the general impact of such an incident on the national economy.

Preventing such a disaster from surfacing or combating it when it does occur should be one of the nation's high profile projects especially now that the chances of having marine pollution in Cameroon have greatly increased with the on-going production and refinery of oil.
By and large, with the understanding that shipping is global and the fact that marine pollution knows no frontiers, it is prudent and necessarily so that the Republic of Cameroon joins the rest of the maritime world in the global struggle against pollution, the "new epidemic."
2. CHAPTER I.

2.1 MARINE POLLUTION FROM SHIPS

In as much as it is important for all nations to keep their environments (land, atmosphere, marine) clean and safe from countless pollutants now known to exist, it is even of greater importance to keep a keener eye on the safety of the marine environment. This is because the degree of utilization of the latter has greatly increased the last few decades as a result of rapid population growth, industrialization and increased shipping activities which have more than ever before exposed the marine environment to serious pollution threats.

While it is prudent and necessarily so for all coastal nations to keep their marine environments clean and safe from numerous pollutants emanating from land, air and sea, it is truth to say that pollution from ships is predominant, and today, it poses serious hazards to both marine life and man. This is why more attention than ever has to be focused on marine pollution from ships. This, too, explains why this project has been devoted mainly to marine pollution from ships and how it could be prevented and/or combated.

Nonetheless, studies carried out by the United States National Academy of Sciences (NAS) indicate that pollution from ships is only 35 percent of the whole, the rest (65 percent) coming from other sources (land, atmosphere, refineries, natural seapage, offshore drilling). Yet, pollution from ships remains predominant from the point of view of heavy damages that can be inflicted on the marine environment by a single major pollution incident such as the AMOCO CADIZ disaster of 1978.
Moreover, it has been proved that pollution from ships relatively increases much faster than pollution from other sources mentioned above, for reasons earlier mentioned. Furthermore, it is much easier to control pollution from ships than it is to do same with pollution from land, for instance, which accounts for as much as 41 percent of the total annual oil inputs into the marine environment.

It was on the basis of such a line of reasoning that the International Maritime Organisation (IMO) started a full scale war against marine pollution from ships, a struggle which is fast yielding fruits as will be seen in subsequent parts of this chapter.

2.2 DEFINITIONS:

For a better apprehension of the subject under discussion, definitions of important fundamental terms and expressions as used in the project has been deemed necessary.

2.2.1 MARINE POLLUTION

Marine Pollution means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries which result or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities. (2) ++

2.2.2 MARINE ENVIRONMENT:

The marine environment means the entire earth surface covered by water and includes port areas, harbours, estuaries, seas, oceans, etc. and the resources therein.
2.2.3 **POLLUTANT:**

A pollutant is a substance which when introduced into the marine environment results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities. (2) ++

2.2.4 **POLLUTER:**

A polluter is a ship of any type whatsoever operating in the marine environment and include hydrofoil boats, air cushion vehicles, submersibles, floating craft and fixed or floating platforms. (3) ++

2.2.5 **OIL:**

Oil means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products. (4) ++

2.2.6 **CRUDE OIL:**

Means any liquid hydrocarbon mixture occurring naturally in the earth whether or not treated to render it suitable for transportation and includes crude oil from which certain distillate fractions may have been removed and crude oil to which certain distillate fractions may have been added. (5) ++

2.3 **IMPORTANT QUESTIONS ON MARINE POLLUTION FROM SHIPS:**

Further to the above definitions, appropriate answers to the following questions would give a clearer picture of the issue under discussion.

I) What makes ships polluters?

II) How do ships pollute?

III) What are the consequences and effects of marine pollution?

IV) What steps are being taken to arrest the situation?
2.3.1 WHAT MAKE SHIPS POLLUTERS?

Before a satisfactory answer is given to the first question, some relevant highlights on the planet-Earth, have been deemed necessary. It is first and foremost important to bear in mind the fact that the Earth is a vast planet with nearly 75 percent of its surface covered by water. Furthermore, there is the need to communicate and to exchange goods and services between nations and States often located long distances apart. The cheapest means to move goods particularly heavy ones between countries separated by the sea or having an access to the sea has always been and is still sea transport. Also, the marine environment is rich in living, non-living resources and amenities. Sea transport again offers the cheapest access to and transportation of such resources. Notwithstanding, the ship which has earlier been defined as polluter is, so far, the only medium for sea transportation.

Both the types and quantities of goods to be conveyed and the types, sizes and numbers of ships to convey the goods and people have increased tremendously over the years with the rapid growth of the world population accompanied by the industrial revolution.

To illustrate the evolution in shipping activities, the last few decades, quotation from the introductory note to the International Conference on Tanker Safety and Pollution Prevention 1978, by Mr. C.P. Srivastava (Secretary General of the International Maritime Organisation - IMO), is most appropriate.

"Within the preceding span of less than two decades, the world shipping scene has undergone a dramatic change. In 1959, for example, there were about 36,000 ships of 100 gross registered tons (grt) and more, aggregating about 125 million grt. Today, the number of ships plying the same seas has increased to about 70,000 and the total tonnage now exceeds 400 million grt. Quite obviously the density of shipping operations has increased in many sea lanes."
What is even more significant is the change in the composition of these ships. The largest cargo vessel in operation during 1959 was UNIVERSE APOLLO of 104,520 deadweight tons. Today, the largest vessel in operation is a mammoth tanker of over half a million deadweight tons. In 1959 not one container ship, chemical carrier or gas carrier was in operation."

There is certainly no doubt that despite the general world recession in shipping, these recent years, that has resulted in scrapping and laying off of a large number of ships, today's figures on ship types and numbers are certainly much greater with a corresponding increase in tonnage.

One of the recent developments in the world trade that has contributed highest to marine pollution is the transportation of oil and oil products. It is difficult to compare the amount of oil pollution caused by ships today with that produced in the past for lack of reliable statistics. However, the truth remains that the potential for oil pollution has increased dramatically, particularly during the last three decades. This has been due to the tremendous increase in oil production that called not only for the building of very large crude carriers (250,000 dwt and above) but also for the building of the ultra large crude carriers (300,000 dwt and above). The increase of such large crude carriers with greater cargo capacities has greatly heightened the potential for major oil pollution incidents by ships.

The rate of increase and the amounts of petroleum hydrocarbons inputs into the marine environment due to marine transportation activities can best be illustrated by the table below for the years 1971 and 1980 drawn by the United States National Academy of Sciences (NAS)
Table I

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>World's Merchant Fleet:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of ships</td>
<td>55.014</td>
<td>73.832</td>
<td>1.34</td>
</tr>
<tr>
<td>Tons gross tonnage</td>
<td>247,202,634</td>
<td>419,910,651</td>
<td>1.70</td>
</tr>
<tr>
<td><strong>World's Tanker Fleet:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbers of ships</td>
<td>6.292</td>
<td>7.112</td>
<td>1.13</td>
</tr>
<tr>
<td>Total deadweight tonnes</td>
<td>169,354,743</td>
<td>339,801,719</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Oil Movement at Sea</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude oil</td>
<td>1.100</td>
<td>1.319.3</td>
<td>1.20</td>
</tr>
<tr>
<td>Product oil</td>
<td>255</td>
<td>268.9</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1.355</td>
<td>1.588.2</td>
<td>1.17</td>
</tr>
</tbody>
</table>

+ Table from IMO publication - "Petroleum in the Marine Environment" 1981.
Furthermore and apart from oil, there are many other bulk cargoes, including chemical substances and liquefied gases whose traffic has as well increased greatly, the last few decades. These substances, though smaller in volume as compared to oil may present a threat of pollution and even hazard to marine and human lives equal to or greater than oil cargoes.

Moreover, from definition, the term pollutant is far from being limited to oil, liquefied gases and bulk chemical substances. It equally includes such wastes as garbage and sewage which originate principally from passenger ferries, chemical carriers, oil tankers, liquefied gas carriers and other ships operating in the marine environment. Even dumping is another form of pollution wherein pollutants are introduced into the marine environment by man.

It is thus clear that what makes ships polluters is the fact that as carriers and/or consumers of pollutants they tend to discharge some of it either through their normal operations or through accidents, into the marine environment.

2.3.2 HOW DO SHIPS POLLUTE?

The next question to be tackled is how ships, earlier referred to as polluters, contaminate the marine environment. In broad terms as earlier stated, ships pollute either by way of operations or through accidents. For a better apprehension, the two types of pollution shall be examined side by side and to some details in the subsequent paragraphs. The analysis used to examine the two concepts is based mainly on oil pollution.

The normal cycle of tanker operation comprises of loading, cargo voyage, offloading, ballasting, tank cleaning, deballasting and loading. This is typical of oil tankers but other tankers carrying liquid bulk cargoes operate more or less the same way. The above stages of tanker operations, more often than not, result in minor or major discharges of pollutants into the marine environment.
The discharges of petroleum hydrocarbons into the marine environment from ships due to transportation activities are generally divided into several categories as follows: (6) ++

I) Operational discharges of oil cargo from tankers.
   a) Crude
   b) Product oil

II) Drydocking

III) Marine terminals, including bunkering operations

IV) Bilge and fuel oil from ships
   a) Machinery room bilges
   b) Fuel oil sludge
   c) Oil ballast from fuel oil tanks

V) Accidental spillages
   a) Tanker
   b) Non-tanker accidents

A/OPERATIONAL POLLUTION:

I) Operational Discharges of Oil Cargo from Tankers

This first category deals with discharges of crude and product oils from tankers through the normal operations of such tankers. From Table I above, it can be deduced that nearly 80 percent of oil transported by sea in 1971 and 1980 were in crude form, the rest, 20%, refined. The reason for the imbalance is found in the fact that installation of refining facilities in the areas of major consumption instead of the production sites, has so far, been the practice. Through tanker operation, as much as 709,000 tonnes of oil are discharged into the sea each year (NAS).

II) Drydocking

Drydocking to ships could be likened to regular medical check-ups for persons. It is carried out in normal cases at regular intervals of one or two years depending on the ship type.
During drydocking several reparatory operations such as welding, greasing, painting, general repairs as well as general servicing of the machinery systems are conducted.

Prior to drydocking, the vessel disposes of wastes such as sludge and slop. If reception facilities were readily available in all repair ports, the contribution of drydocking to oil discharges into the marine environment would be minimal. Unfortunately, this has not been the case. The US National Academy of Sciences (NAS) holds that the annual loss of oily wastes as a result of drydocking is 34,000 tonnes.

III) MARINE TERMINALS, INCLUDING BUNKER OPERATIONS

Terminal operations include loading and discharging cargo and bunkering of ships. Spillages more often than not occur as a result of human error such as overfilling tanks, disconnecting hoses without adequate drainage, etcetera. Spillages may also result from technical failures such as hose/line failure, submarine pipeline ruptures, storage tank ruptures, etc. Bunkering operations also cause spillages.

The total annual spillages from marine terminals and bunkering operations has been estimated at 20,000 tonnes by the NAS.

IV) BILGE AND FUEL OIL

Discharges under this category include the following:

(a) Machinery space bilge
(b) Fuel oil sludge and
(c) Oily ballast from fuel tanks.

a) Bilge is the oily water that usually collects on the floor of the engine room. It is sometimes referred to as bilge water/oil. Studies on bilge oil by the NAS indicate that a steam tanker generates 5 gallons of bilge oil per day while a motor tanker generates 15 gallons of same daily. Given the number of tankers in the world to be 7,100 (see table I) and considering that steam and motor constitute approximately one
half of the tanker fleet, the amount of bilge oil generated each
day cannot be underestimated. However, of the large amount of
bilge generated by both tankers and non-tankers, a considerable
part is discharged into the sea. The total volume discharged
annually has been estimated at 300.000 tonnes by NAS.

b) Sludge is the mixture of oils (fuel and lubricants) and water
from the engine room. Tankers are able to retain sludge in slop
tanks for eventual disposal to shore reception facilities but
non-tankers, not generally provided with adequate facilities for
retention of sludge would dispose of sludge into the sea if recep­
tion facilities are not available. As it were, the total quantity
of sludge discharged into the sea by tankers and non-tankers has
been estimated at 186.000 tonnes per year by NAS.

c) Oil Ballast from Fuel Oil Tanks.

Tankers carry ballast water either in cargo oil tanks or in
segregated ballast tanks. This prevents contamination of water
ballast by fuel oil. In the case of non-tankers particularly
fishing vessels which are bound to carry large quantities of
ballast water for safety purposes, fuel tanks are used for carriage
of ballast water causing contamination of the ballast water by fuel
oil. The annual discharge of oily ballast into the sea has been
estimated at 315.000 tonnes by NAS.

The total amount of oil in tonnes discharged into the oceans
annually due to marine transportation and resulting from ships'
operation can be summarized as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanker operations</td>
<td>709.000</td>
</tr>
<tr>
<td>Drydocking</td>
<td>34.000</td>
</tr>
<tr>
<td>Marine Terminals including Bunkering Operations</td>
<td>20.000</td>
</tr>
<tr>
<td>Bilge and Fuel Oil</td>
<td>315.000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,078.000</strong></td>
</tr>
</tbody>
</table>
B/ACCIDENTAL POLLUTION

Loading and discharging ports particularly for tankers are often situated long distances apart and the sea voyages between such ports are often full of hazards, the highest risk areas being the highly congested coastal zones. An oil tanker, for instance, on a voyage from the Republic of Cameroon to the United States of America, across the Atlantic Ocean, is subject to several risks such as foundering, stranding, collisions, fires and explosions, and what have you.

The causes of such casualties can be grouped under three main categories, namely:

a) Human system failure - human error, fatigue, negligence, sabotage, inadequate training, etc.

b) Structural system failure - machinery failure, poor design, poor maintenance, etc.

c) Environmental influences on these failures - bad weather, rough seas, storm, etc.

Whenever a marine casualty occurs involving either an oil tanker or vessel other than an oil tanker or both, carrying oil as cargo or fuel, the chances of marine pollution are extremely high.

According to the data published by the International Tanker Owners Pollution Federation Ltd. (ITOPF) and the French Institute of Petroleum (FIP), the total annual average of oil spills due to tanker and non-tanker accidents from 1974 to 1980 for tankers and from 1974 to 1979 for non-tankers, is as follows: (7) ++

Total annual average for tankers = 390,000 tonnes
Total annual average for non-tankers = 17,000 "

The total annual quantity of oil discharged into the oceans due to marine accidents is therefore 407,000 tonnes
Thus, the total annual quantity of oil discharged into the marine environment due to marine transportation can be summarized as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Pollution</td>
<td>1.078.000</td>
</tr>
<tr>
<td>Accidental Pollution</td>
<td>407.000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.485.000</strong></td>
</tr>
</tbody>
</table>

2.3.3 WHAT ARE THE CONSEQUENCES AND EFFECTS OF MARINE POLLUTION?

The above estimates may not be that accurate but they are a clear indication as to the amount of oil discharged annually into the marine environment through transportation activities.

It is simply amazing to imagine how much oil has been discharged into the sea over the years given that the total ship sources only account for 35 percent of the whole, the rest 65 percent coming from non-ship sources.

Hazardous liquid substances other than oil (gases and chemicals) are transported in a similar manner like oil but in more sophisticated and relatively smaller tankers. Chemical and gas carriers undergo similar operations as do tankers and are as well subjected to operational and accidental types of pollution, however, to a lesser degree, so far.

From the above analysis, it is clear that the marine environment cannot possibly contend the huge amounts of pollutants discharged into it day in day out without causing serious damages to its living resources. Following NAS's 1975 estimates on annual inputs into the oceans of oil, it can be deduced that in the last three decades and at the rate of 6.1 million tonnes per year, a total of 183 million tonnes of oil were discharged into the same volume of water.
This, together with discharges from hazardous substances earlier referred to as well as the tremendous amounts of sewage and garbage continuously being dumped into the oceans would sooner or later render the marine environment totally unhealthy for both man and the living resources therein, if the present trend continues.

The AMOCO CADIZ disaster is a glaring example that can best illustrate the consequences of a tanker disaster and the effects of oil to the marine environment.

The AMOCO CADIZ was a super tanker that lost steering control and ran aground off the Brittany Coast of France on the night of March 16, 1978. The result was history's biggest oil tanker spill and the most costly maritime casualty ever.

The tanker itself cost 15 million dollars. The 68 million gallons of crude oil the tanker was ladden with, were estimated at 24 million dollars. The total area polluted was about 130 sq. miles.

Damages and clean-up expenses cost the French 95 million dollars, and local communities also suffered losses amounting to some additional 30 million dollars.

Environmental damages were quite extensive. Some 10,000 shore birds died from the effect of the spill and 5,000 tons of contaminated oysters are said to have been destroyed. However, production of marketable oysters resumed, three years later, in 1981.

The total damages caused by the AMOCO CADIZ incident has been estimated at nearly 2 billion dollars (3). +

The estimates may not be exact but they are indicative of the after effects of a major accident involving an oil tanker. A similar incident with a chemical tanker would obviously be much more devastating given the higher degree of hazard and toxicity that characterizes most chemical substances.
However, if accidental pollution were as frequent as the operational, the situation would be completely different.

Notwithstanding, operational pollution if not checked, is likely to produce disastrous effects on fisheries, human health, amenities etc. in the long run.

2.3.4 WHAT STEPS ARE BEING TAKEN TO ARREST THE SITUATION?

After portraying, however cursorily, what precisely makes ships polluters, how they pollute and pollution's aftermath, the stage is believed to have been set for the next part which is expected to cast light on measures being taken to remedy the situation.

Having had several bitter experiences from marine pollution, the maritime world, particularly became conscious of the imminence of such a danger and its ever-increasing nature. In search of a lasting solution to the problem, the maritime community has been and still is making remarkable joint efforts through international organisations and workshops.

In so far as this chapter is concerned, the work of the International Maritime Organisation (IMO) which is considered to be the greatest global effort ever made in this direction, would help to illustrate the practical approach being taken to solve this problem internationally; leaving aside, for the time being, some relevant information about IMO as an organisation and the role of other organisations in the struggle.

By the way, IMO has carried on this struggle through formulating and bringing into force several Conventions and related instruments on marine pollution. Here, pollution Conventions include the following:
a) The International Convention for the Prevention of Pollution of the Sea by Oil 1954, as amended in 1962 and 1969 (OILPOL 54),

b) International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (INTERVENTION 69) and Protocol 1973;

c) International Convention on Civil Liability for Oil Pollution Damage, 1969 (CIVIL LIABILITY 69) and Protocol 1976;


e) International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 (STCW 78)

f) International Convention for the Prevention of Pollution from Ships, 1973/1978 (MARPOL 73/78); and

g) Safety of Life at Sea Convention 1974 (SOLAS 74) and Protocol 1978.

As the titles well suggest, OILPOL and MARPOL conventions form the core of marine pollution conventions while the others play more or less a supporting role.

OILPOL 54 marks the first major step towards the global control of marine pollution. It was in 1954 that an International Conference held in London, adopted the OILPOL 1954 Convention. The prime objective of the convention was the protection of the seas from oil pollution. To achieve this, prohibited zones within which discharge of persistent oil and oily mixtures were prohibited, and adopted amendments included prescribed discharge criteria, mandatory carriage of an oil record book of specified form for record of all operations and inspection of the record books by competent officials.
Nevertheless, the leading convention in the sphere of marine pollution today is MARPOL 73/78 that came into force on 2 October 1983, replacing OILPOL 54 as amended in 1962 and 1969. MARPOL 73/78 has superseded OILPOL 54 in all aspects and is seen by marine pollution analysts as a more effective weapon for marine pollution control particularly as it covers not only pollution by oil but also by other harmful substances in packaged forms, sewage and garbage from ships. It also covers all the technical aspects of pollution prevention from ships, excluding the disposal of wastes into the sea by dumping (covered by the London Dumping Convention) and does not apply to pollution arising out of the exploration and exploitation of sea bed mineral resources.

MARPOL 73/78 is applicable to any ship of any type and size including hydrofoil boats, air cushion vehicles, submersibles, floating craft and fixed or floating platforms operating in the marine environment.

The Convention consists of Articles and two Protocols dealing respectively with reports on incidents involving harmful substances and arbitrations as well as five Annexes, the first two of which are mandatory. The last three are optional.

For a better apprehension of the prime objectives of the Convention, the following areas shall be examined

A/ Annexes I, II, III, IV, and V.

A/ ANNEX I

I) POLLUTION BY OIL:

States ratifying the convention are required to give an immediate effect to the provisions of this Annex.

The provisions encompass several factors the most important ones being the following:

- Definition of "special area"
- Reception Facilities
- Surveys and Certification
- Oil Record Books
- Discharge Criteria
- Discharge control within the special areas
- New and Existing ships

a) "Special Area" is defined under the present Annex as a sea area where for recognized technical reasons in relation to its oceanographic and ecological conditions and to the particular character of its traffic the adoption of special mandatory methods for prevention of sea pollution by oil is required.

Special Areas include the Mediterranean Sea area, the Baltic Sea area, the Black Sea area, the Red Sea area and the Gulfs area.

b) Reception Facilities

Reception facilities in the present context are provisions in ports and oil terminals for the reception of oil wastes and dirty ballast water from tankers and non-tankers.

It is stipulated under this Annex that Governments of each Party to the Convention shall undertake to ensure the provision
at oil loading terminals, repair ports and other ports needing such facilities for residues and oily mixtures from tankers and ships other than tankers. Such provisions shall be sufficiently adequate to meet the needs of the ships using them, thus avoiding undue delays to the ships.

c) Surveys and Certification

Oil tankers of 150 tons gross tonnage and above, and every other ship of 400 tons gross tonnage and above shall be subject to surveys.

Administrations are, nevertheless, required to establish appropriate measures for tankers of less than 150 grt and ships of less than 400 grt, not subjected to the provisions of the Annex.

The types of surveys envisaged are as follows:

- Initial survey before the vessel is put into service. This involves the complete survey of ship's structure, equipment, fittings, arrangements and materials in accordance with the requirements of the Annex.

- Periodical surveys at intervals to be determined by the Administration, but not exceeding five years. Such surveys shall be aimed at ensuring that the structure, the equipment, fittings, arrangements and materials fully comply with the requirements of the Annex.

- Intermediate Surveys at intervals to be specified by the Administration, but not exceeding thirty months. Such surveys shall be geared towards ensuring that the equipment and associated pump and piping systems including oil discharge
monitoring and control systems, fully comply with the applicable requirements of the Annex and are in good working conditions.

The above mentioned surveys are expected to be carried out by Officers of the Administration. But the Administration may entrust the surveys either to surveyors nominated for the purpose or to organisations recognized by it. Which-ever is the case, the Administration concerned fully guarantees the completeness and efficiency of the surveys.

After a successful completion of such a survey an International Oil Pollution Prevention (IOPP) Certificate shall be issued either by any persons or organisations duly authorized by the Administration concerned. However, the latter shall assume full responsibility for such a certificate.

d) **Oil Record Books:**

Oil tankers of 150 grt and above and every ship of 400 grt and above other than tankers are required to carry onboard Oil Record Books to register such operations as ballasting, deballasting, cleaning of cargo and fuel tanks, discharge of oily residues etcetera. The said book shall contain all accidental and operational discharges and shall be inspected by the officials concerned with the controlling of the observance of the requirements of the Annex.

e) **Discharge Criteria:**

Subject to provisions regulating ship operations in special Areas, exceptional cases of discharges and discharge by ships other than tankers of less than 400 grt, the discharge into the marine environment of oil or oil mixtures from ships is prohibited except when all the following conditions are satisfied:
- For Oil Tankers:

1) The tanker is not within a special area;

2) The tanker is more than 50 nautical miles from the nearest land;

3) The tanker is proceeding en route;

4) The instantaneous rate of discharge of oil content does not exceed 60 litres per nautical mile;

5) The total quantity of oil discharged into the sea does not exceed for "existing tankers" 1/15000 of the total quantity of the particular cargo of which the residue formed the part, and for "new tankers" 1/30,000 of the total quantity of the particular cargo of which the residue formed a part; and

6) The tanker has in operation, an oil discharge monitoring and control system and a slop tank arrangement.

- For a ship of 400 grt and above other than an oil tanker:

1) the ship is not within a special area;

2) the ship is more than 12 nautical miles from the nearest land;

3) the ship is proceeding en route;

4) the oil content of the effluent is less than 100 parts per million; and

5) the ship has in operation an oil discharge monitoring and control system, oily water separating equipment, oil filtering system or other installations as required by the Annex.

- For ships of less than 400 grt other than oil tankers operating outside the special areas, the Administration concerned shall ensure that they are properly equipped with installations to ensure storage of oil residues on board and their discharge to reception facilities in conformity with
the requirements of the Annex.

f) Discharge Control Within Special Areas:

- Any discharge into the sea of oil or oily mixture from any oil tanker and any ship of 400 grt and above other than an oil tanker shall be prohibited while in a special area;

- Any discharge into the sea of oil or oil mixture from a ship of less than 400 tons gross tonnage, other than an oil tanker, shall be prohibited while in a special area, except when the oil content of the effluent without dilution does not exceed 15 parts per million or alternatively when all of the following conditions are satisfied:

1) the ship is proceeding en route;
2) the content of the effluent is less than 100 parts per million; and
3) the discharge is made as far as practicable from the land, but in no case less than 12 nautical miles from the nearest land.

However, the above criteria are not applicable to:

- the discharge of clean or segregated ballast,
- the discharge of processed bilge water from machinery spaces, provided that all of the following conditions are satisfied:

1) the bilge water does not originate from cargo pump room bilges;
2) the bilge water is not mixed with oil cargo residues;
3) the ship is proceeding en route;
4) the oil content of the effluent without dilution does not exceed 15 parts per million;
5) the ship has in operation an oil-water separating equipment and filtering system as required by the Annex; and the filtering system is equipped with a stopping device which will ensure that the discharge is automatically stopped when the oil content of the effluent exceeds 15 ppm.

9) Definitions:

1) New ship and Existing ship

2) New oil tanker and Existing oil tanker

1) "New ship" means a ship:

- for which the building contract is placed after 31 December 1975; or

- in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction after 30 June 1976; or

- which has undergone a major conversion:
  - for which the contract is placed after 31 December 1975; or
  - in the absence of a contract, the construction work of which is begun after 30 June 1976; or
  - which is completed after 31 December 1979.

"Existing ship" means a ship which is not a new ship.

2) "New oil tanker" means an oil tanker:

- for which the building contract is placed after 1 June 1979; or
- in the absence of a building contract, the keel of which is at a similar stage of construction after 1 January 1980; or
- the delivery of which is after 1 June 1982; or
- which has undergone a major conversion:

.../...
for which the contract is placed after 1 June 1979; or
in the absence of a contract, the construction work of
which is begun after 1 January 1980; or
which is completed after 1 June 1982.

"Existing oil tanker" means a tanker which is not a new tanker.

The above distinction particularly for the new and existing oil tankers are made essentially for the purpose of implementing certain technical requirements of the MARPOL 73/78 Convention which include the following:

- Clean Ballast Tanks (SBT)
- Crude Oil Washing (COW)
- Inert Gas System and the Protective Location (PL) systems.

1) CBT is a system in which certain cargo tanks of an oil tanker are dedicated for the sole carriage of water ballast but piping and pumping arrangements are not separated from cargo oil and fuel oil systems. The system is being used as an interim measure for existing tankers. And as from October 2, 1983 when MARPOL 73/78 entered into force, existing tankers of 40,000 deadweight tons (dwt) and above had 4 years whereas tankers of 70,000 dwt and above had just 2 years to comply with the new requirements.

2) SBT is a system whereby certain tanks of an oil tanker are reserved exclusively for the carriage of ballast water. Unlike the CBT, the SBT system has separate piping and pumping arrangements for cargo oil and fuel oil systems.

3) COW is a system in which crude oil instead of steam is used to clean residues left clinging to tank walls after the discharge of cargo oil. COW has been considered more effective than steam in tank washing since it eliminates the accumulation of sludge.
4) IGS is the system used to reduce the oxygen content of the atmosphere in cargo tanks after discharge of cargo oil in order to eliminate the risk of explosion. The system is used alongside with COW for the purpose of reducing the oxygen content in tanks after such a washing. The inert gas used is generally produced as boiler flue gas containing less than 5% of oxygen and is pumped into cargo spaces in which oxygen content should not exceed 8 percent.

5) PL is the requirement that the SBT must be arranged in such locations as to provide protection of cargo tanks against rupture in the event of grounding, collision and other possible damages.

The application of the above systems to new and existing oil tankers is as follows:

- New crude oil tankers of 20,000 dwt and above must be provided with SBT and COW.

- New product carriers of 30,000 dwt and above must be provided with SBT.

- Existing crude oil carriers of 40,000 dwt and above must be provided with CET or COW.

- Existing product carriers of 40,000 dwt and above must be provided with SBT or CET.

B/ ANNEX II

II) CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

The present Annex details the discharge criteria and the measures for the control of pollution by noxious liquid substances carried in bulk.

Annex II like Annex I, is mandatory but whereas the latter entered into force on 2 October 1983, Annex II is only expected to be in force as from 2 October 1986.
The reason for the time lapse is found in the difficulties involved in implementing the Annex II. Its entry into force as preceded is thus subject to overcoming the said difficulties before the stated date.

The provisions of Annex II shall be briefly examined through the sub-headings here-under enlisted:

- Definition of "special area"
- Reception Facilities
- Surveys and Certification
- CARGO RECORD BOOK
- Categorization and Listing of Noxious Liquid Substances
- Discharge Criteria

a) SPECIAL AREA:

"Special Area" is defined as a sea area where for recognized technical reasons in relation to its oceanographic and ecological conditions and to its peculiar transportation traffic the adoption of special mandatory methods for the prevention of sea pollution by noxious liquid substances is required.

For the purposes of the present Annex, only two special areas are recognized viz:

- the Baltic Sea Area; and
- the Black Sea Area.

b) RECEPTION FACILITIES:

Reception Facilities are facilities adequate for the reception of noxious liquid substances at port terminals and repair ports.
Governments of Parties to the MARPOL 73/78 convention are expected to ensure the provision of reception facilities according to the needs of ships using their port terminals or repair ports.

1) Ports and terminals

Cargo loading and unloading ports and terminals shall have facilities adequate for reception without undue delay to ships of such residues and mixtures containing noxious liquid substances as would remain for disposal from ships carrying them in compliance with the Annex.

2) Repair ports

Ship repair ports undertaking repairs for chemical tankers shall have facilities adequate for the reception of residues and mixtures containing noxious liquid substances.

Determination of the types of facilities for ports and terminals as well as for repair ports shall be done by the individual Governments concerned.

c) SURVEYS AND CERTIFICATION:

All ships subject to the provisions of this Annex and carry noxious liquid substances in bulk are required to undergo the following surveys:

- An initial survey before the ship is put to service.

- Periodical surveys at intervals specified by the administration concerned. Such intervals shall, however, not exceed five years.

- Intermediate surveys at intervals not exceeding thirty months to be specified by the Government concerned.
The surveys in question shall be conducted by officers of the Administration. The Administration may entrust such surveys to surveyors nominated by it or to organisations it recognizes. Whatever the case, the Administration concerned is required to fully guarantee the completeness and efficiency of the surveys.

Following a successful completion of survey of a ship the Administration or person or organization duly authorized by the Administration shall issue an International Pollution Prevention Certificate for the carriage of Noxious Liquid Substances in Bulk. The Administration shall assume, in every case, full responsibility for the certificate the duration of which shall be specified by the Administration but shall not in any case exceed five years from the date of issue except in specified cases.

CARGO RECORD BOOK

It is required that every ship to which Annex II applies be provided with a cargo Record Book. The latter shall be completed on a tank-to-tank basis and shall cover the following operations with respect to the carriage of noxious liquid substances: loading, unloading, transfer of cargo or cargo residue or mixtures containing cargo to a slop; cleaning of cargo tanks, ballasting of cargo tanks; transfer of dirty ballast water as well as discharge into the sea as conditioned by the discharge criteria examined bellow.

CATEGORISATION AND LISTING OF LIQUID NOXIOUS SUBSTANCES:

In order to effectively control marine pollution by noxious liquid substances through discharge restrictions, the substances have been divided into four categories viz, A, B, C and D in accordance with their degrees of hazard to marine resources, human health, amenities and other legitimate uses of the marine environment.
Prior to the conference that adopted MARPOL 73, some 250 substances had been categorized as earlier indicated. The list of the substances has been appended to the MARPOL 73/78 convention. Since the establishment of the list a lot more noxious liquid substances have been discovered and shall eventually be categorized in the like manner.

Substances not belonging to any of the four categories form a separate group.

f) DISCHARGE CRITERIA:

The discharge criteria for the noxious liquid substances follow their various degrees of hazard as previously indicated and can be summarized in the following Table.
The discharge of categories A, B and C substances in special Areas is generally prohibited. Such substances or their mixtures shall be discharged into reception facilities. Rules allowing discharge of tank residues within special areas are very stringent.

+ Table from MARPOL 73/78 Convention

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>SUBSTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINIMUM SPEED OF SHIP</td>
<td>CATEGORY A</td>
</tr>
<tr>
<td>.SELF-PROPELLED</td>
<td>7 Knots</td>
</tr>
<tr>
<td>.NOT SELF-PROPELLED</td>
<td></td>
</tr>
<tr>
<td>MAX. CONCENTRATION OF SUBSTANCE AT TIME OF DISCHARGE</td>
<td>VIRTUALLY</td>
</tr>
<tr>
<td>CONCENTRATION</td>
<td>NIL</td>
</tr>
<tr>
<td>MAX. QUANTITY OF CARGO DISCHARGED FROM EACH TANK</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>MINIMUM DEPTH OF WATER</td>
<td>25 metres</td>
</tr>
<tr>
<td>MINIMUM DISTANCE FROM LAND</td>
<td>12 miles</td>
</tr>
</tbody>
</table>
It is worth noting that the new International Bulk Chemical Code, also regulates the carriage of noxious liquid substances in bulk.

However, there are two fundamental differences that exist between the code and the Convention vis-a-vis categorization and hazardous considerations.

Whereas the convention categorizes noxious liquid substances according to their degree of hazard to marine resources, human health, amenities and other legitimate uses of the marine environment, respectively, the BC Code classifies the same into suitable ship types (I, II, III, and IV) for carriage of such substances and in accordance with their degree of hazard to human life only.

c) ANNEX III:

III) THE PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES CARRIED BY SEA IN PACKAGE FORMS, OR IN FREIGHT CONTAINERS, PORTABLE TANKS OR ROAD AND RAIL TANK WAGONS:

Annex III is one of the optional Annex es of MARPOL 73/78. The Annex has not yet fulfilled the tonnage requirement for entry into force.

Annex III shall be examined through the following sub-headings:

- Scope of Application
- Packaging
- Marking and Labelling
- Documentation
- Stowage
- Quantity Limitations
- Other relevant requirements
a) APPLICATION:

The Annex applies to all ships carrying harmful substances in packaged forms, or in freight containers, portable tanks or road and rail tank wagons.

Additionally, the Annex considers empty receptacles, freight containers, portable tanks and road and rail tank wagons which have been used previously for the carriage of harmful substances as being equally harmful and require, thus, that they be treated as such unless adequate precautions have been taken to ensure that they contain no residue that is hazardous to the marine environment.

b) PACKAGING:

In order to minimize hazard to the marine environment from harmful substances in packaged form, packagings, freight containers, portable tanks and road and rail wagons must be adequately packaged.

c) MARKING AND LABELLING:

Packages regardless of whether or not they are shipped individually or in units containing harmful substances and carried by sea in the various packaged forms shall be marked with the correct technical name and shall have a distinctive label indicating that the contents are harmful. Such identification is expected to be supplemented as the case may be by other relevant additional information such as the United Nations Number.

d) DOCUMENTATION:

In the shipping documents supplied by the shipper, the correct technical name of the substance shall be used and the documents shall include a certificate or declaration regarding proper packaging, marking, labelling and proper conditions of carriage.
as proof to minimizing hazard to the marine environment. Furthermore there shall be a manifest for each ship carrying harmful substances specifying the harmful substances on board as well as a detailed stowage plan.

e) STOWAGE:

The proper stowage of packaged harmful substances is required for the purpose of minimizing hazards to the marine environment and safeguarding against harm to life and property on board.

f) QUANTITY LIMITATION:

Owing to the fact that certain harmful substances are extremely hazardous to the marine environment, it has been considered essential to minimize the hazard either by prohibiting the carriage of such substances or limiting the quantity which may be carried aboard any one ship. As such, the size, construction and equipment of the ship as well as the packaging and the inherent nature of the substance shall act as determining factors.

g) OTHER RELEVANT REQUIREMENTS:

As a supplement to the present Annex, the Governments of Parties to the Convention shall work out detailed requirements for the carriage of harmful substances by sea. Statement shall issue regarding exceptions and notification by shipowner or his agent of ships arrival at least 24 hours prior to such an arrival.

D/ ANNEX IV:

IV) REGULATIONS FOR THE PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS:

Annex IV is also optional. The Annex is still short of the conditions required for its entry into force.

The contents of the Annex could be briefly examined through the following points:
Definition

1) "New and Existing Ship"
2) Sewage
3) "Nearest land"

Application

Surveys and Certification

Discharge of Sewage

Reception Facilities

a) DEFINITIONS:

1) "New ship" for the purpose of this Annex means:

- A ship for which the building contract is placed, or in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction, on or after the date of entry into force of this Annex; or

- A ship the delivery of which is three years or more after the date of entry into force of the Annex.

"Existing ship" means a ship which is not a new ship.

2) "Sewage means:

- Drainage and any form of toilets, urinals and W.C. scuppers;
- Drainage from mechanical premises (dispensary, sick bay etc.) via wash basin, wash tube and suppers located in such premises;
- Drainage from spaces containing living animals; or
- Other waste waters when mixed with the drainages defined above.
3) "Nearest Land" means the same as in Annex I. "From the nearest land" means from the baseline from which the territorial sea of the territory in question is established in accordance with the law of the Sea Convention, with the exception of the North Eastern Coast of Australia considered otherwise for the purpose of the convention.

b) APPLICATION:

The provisions of Annex IV apply to the following:

1) New ships of 200 grt and above;
2) New ships of less than 200 grt which are certified to carry more than 10 persons;
3) New ships which do not have a measured gross tonnage and are certified to carry more than 10 persons, and to

1) Existing ships of 200 grt and above, 10 years after the date of entry into force of the Annex;
2) Existing ships of less than 200 grt which are certified to carry more than 10 persons, 10 years after the date of entry into force of the present Annex; and
3) Existing ships which do not have a measured gross tonnage and are certified to carry more than 10 persons, 10 years after the entry into force of the Annex.

c) SURVEYS AND CERTIFICATION:

All ships which are required to comply with Annex IV shall be subject to an initial survey as well as periodical surveys at intervals specified by the Administration, but not exceeding 5 years. The surveys shall aim at ensuring that details on design, construction, equipment, fittings, arrangement and materials are fully complied with as specified in Annex IV.
An International Sewage Pollution Prevention Certificate shall be issued for a period specified by the Administration concerned. The duration shall not in any case exceed five years from the date of issue except for cases of extension which are limited to five months.

A certificate shall cease to be valid in cases of significant alterations of the ship or upon transfer of such a ship to the flag of another State. In the latter case, the certificate shall remain in force but for a period not exceeding five months provided that it would not have expired before the end of that period.

d) DISCHARGE OF SEWAGE:

1) The ship is discharging comminuted and disinfected sewage using a system tested and approved by the Administration in compliance with the requirements of Annex IV, at a distance of more than 4 nautical miles from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land, provided that the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots. It is however left to Administrations to approve of the discharge rates based, nevertheless, on standards developed by IMO in the present Convention.

2) The ship has in operation a tested and approved sewage treatment plan which has been certified by the Administration as meeting the requirements of the Annex.

3) The ship is situated in the waters under the jurisdiction of a State and is discharging sewage in accordance with such less stringent requirements as may be imposed by such a State.
Nonetheless, in exceptional cases such as discharge for the purpose of safety or in attempt to minimize discharge following damage to the ship, the above discharge criteria cease to apply.

e) **RECEPTION FACILITIES:**

Governments of Parties to the Convention are required to ensure provision of facilities at ports and terminals for reception of sewage. Such reception facilities shall be sufficiently adequate to meet the needs of ships using them, avoiding thus, undue delays to such ships.

E/ **ANNEX V:**

v) **REGULATIONS FOR THE PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS:**

Annex V is one of the optional Annexes of MARPOL 73/78. It has not yet met the conditions for entry into force.

The present Annex could be understood through a brief examination of the following points:

- **Definitions**
  1) Garbage
  2) Nearest land
  3) Special area

- **Application**

- **Disposal of garbage**
  1) Outside special areas
  2) Special requirements
  3) Within Special areas

- **Reception Facilities**
  1) Reception facilities in general for the reception of garbage
  2) Reception facilities within a special area
a) **DEFINITION:**

1) "Garbage" means all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically.

2) "Nearest land" is defined same as in Annexes I & IV.

3) "Special Area", same as defined under Annex I

b) **DISPOSAL OF GARBAGE:**

1) Outside special Areas

Subject to exceptional disposal of garbage into the sea for safety purposes, accidental loss, etcetera, as well as for various reasons as specified below under special requirements for garbage disposal and garbage disposal within special areas, the following restrictions shall apply:

- The disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets and plastic garbage bags, is prohibited;

- The disposal into the sea of garbage shall be made as far as possible from the nearest land. Such disposal is prohibited if the distance from the nearest land is less than 12 nautical miles for dunnage, lining and packing materials which will float or 12 nautical miles for food wastes and all other garbage including paper products, rags, glass, metal, bottles, crockery and similar refuse.
Disposal of garbage as stated above may be permitted when such garbage has passed through a comminuter or grinder and made as far as practicable from the nearest land but is prohibited if the distance from the nearest land is less than 3 nautical miles. The comminuted or ground garbage shall be capable of passing through a screen with openings not greater than 25 millimetres.

2) Special Requirements:

The disposal of any materials regulated by Annex V is prohibited from fixed or floating platforms engaged in exploration, exploitation and associated offshore processing of seabed mineral resources, and from all other ships when alongside or within 500 metres of such platforms. Such disposals may be permitted for food wastes when they have been passed through a comminuter or grinder from such platforms located more than 12 nautical miles from land and all other ships when within 500 metres of such platforms.

3) Within Special Areas

- Subject to exceptions earlier mentioned, disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets and plastic garbage bags as well as all other garbage, including paper products, rags, glass, metal, bottles, crockery, dunnage, lining and packing materials, are prohibited.

- Disposal of food waste into the sea shall be made as far as practicable from land, but not in any case less than 12 nautical miles from the nearest land.

d) RECEPTION FACILITIES:

1) Reception facilities in general:

Governments of Parties to the Convention shall undertake to ensure the provision of reception facilities at ports and terminals for the
reception of garbage. Such facilities shall be adequate to the needs of ships using them so as to avoid loss of time by such ships.

2) Reception facilities within special areas

Governments of Parties to the Convention, the coastline of which boarders a special area, are required to ensure in the shortest time possible that all ports within a special area are adequately provided with reception facilities.

B/ PROTOCOLS OF 1978 RELATING TO TANKER SAFETY AND POLLUTION PREVENTION

By and large, the MARPOL Convention originally known as MARPOL 73 has all along been referred to in this project as MARPOL 73/78. What has brought about the change in the appellation?

It all began in February 1978 when the International Conference on Tanker Safety and Pollution Prevention (TSPP Conference) was convened in London in response to the US Government initiative following a series of tanker accidents that occurred in the winter of 1976 - 1977, most of which took place in or near United States' waters. The Conference adopted two Protocols, among other things relating to the MARPOL 73 Convention and the Safety of Life at Sea Convention, 1974 (SOLAS 74). The Protocols have introduced new measures aimed at strengthening and expanding the requirements of the parent conventions.

While the Protocol of 1978 relating to SOLAS 74 is an instrument separate from the 1974 SOLAS Convention, the MARPOL convention incorporates and merges with the MARPOL 73 Convention. Thus the 1973 MARPOL Convention and the 1978 Protocol are treated as if they were a single instrument. Consequently, MARPOL 73 as modified by the Protocol of 1978 is generally referred to as MARPOL 73/78.
The explanations for the above procedures are found in the need to bring the MARPOL Convention and its Protocol and the SOLAS Protocol into force as soon as possible.

The 1974 SOLAS Convention at the time of the Conference was already ratified by over half the number of nations required for its entry into force, the TSPP Conference, as a result, elected to adopt the SOLAS Protocol as a separate instrument from the SOLAS Convention itself. Governments therefore had to ratify the SOLAS Convention as a prerequisite to ratifying its Protocol (although both could be ratified simultaneously) and the SOLAS Protocol could not enter into force internationally before the parent Convention did so.

On the other hand, very few Governments had ratified the MARPOL 73 Convention. And as a consequence, the Conference decided to merge the MARPOL convention into its Protocol with the result that the two became one instrument for ratification purposes.

The route cause for merging the MARPOL Protocol to its parent Convention is found in the technical problems associated with the implementation of Annex II of the latter. The Conference agreed to delay for a period of three years after the entry into force of the Protocol, the entry into force of Annex II. This was intended to allow countries to accept the Protocol, enabling Annex I to be effective at an early date while allowing technological developments to proceed leading to implementation of Annex II.

In a nutshell, the TSPP Conference brought about many developments in the area of tanker safety and marine pollution prevention, the most important being:
For the 1978 SOLAS Protocol

a) The Inert Gas Systems (IGS) for the Protection of Cargo Tanks:
In the 1974 SOLAS Convention requirements, the IGS were limited to new oil tankers of over 100,000 dwt and new combination carriers over 50,000 dwt. The 1978 SOLAS Protocol has extended the IGS requirements to the following:

1) All new tankers over 20,000 dwt;
2) All existing crude oil carriers 20,000 dwt and all existing product carriers over 40,000 dwt;
3) All existing tankers of 20,000 dwt and above where high capacity machines are fitted; and
4) All tankers where COW is fitted.

The Inert Gas Systems are required within two years of SOLAS Protocol entering into force for tankers of 70,000 dwt and above, and after a further period of two years for crude oil carriers of 40,000 dwt and above.

b) STEERING GEAR:

In addition to the steering gear requirements for passenger and cargo ships in SOLAS 74, special requirements were formulated by the TSPP Conference relating to control, communication and local operation of steering gear for new and existing tankers. Procedures, drills covering the operation and testing of steering gear at stipulated intervals were also developed.

The new requirements of the SOLAS Protocol include the following:

1) All tankers of 10,000 gross tons and above shall have two remote steering gear control systems, each operable separately from the navigating bridge.
2) The main steering gear of new tankers of 10,000 gross tons and above shall comprise two or more identical power units and be capable of operating the rudder while operating with one or more power units. Ships so equipped are expected to have an alarm on the navigating bridge to warn of system failure and an alternative power supply that will start to operate automatically within 45 seconds of failure.

c) RADAR AND COLLISION AVOIDANCE AIDS

The TSPP Conference agreed that all ships between 1,600 and 10,000 grt be fitted with radar, while all ships of 10,000 grt and above must have two radars, each capable of operating independently of the other, on the date the SOLAS Protocol entered into force.

d) INSPECTIONS AND CERTIFICATION

During the TSPP Conference the requirements for inspections and certification of the 1974 SOLAS Convention were strengthened and new arrangements were formulated where necessary. The following are some of the main changes:

1) Added to the periodical survey specified in the SOLAS 74, Administrations must institute unscheduled inspection of all ships unless mandatory annual surveys are carried out.

2) While the 1974 SOLAS Convention requires surveys for safety equipment certificate to be carried out every two years, the new SOLAS Protocol requirement lay emphasis on an annual survey for tankers of ten years of age and above.

3) While the 1974 SOLAS Convention does not specify a period of validity for cargo ship safety construction certificate, the SOLAS Protocol does.
Such certificates are required to have a maximum period of validity of five years.

4) Under the SOLAS Protocol, the Ship Safety Construction Certificate survey requirements have been extended to include the cargo pumping, piping and venting arrangements.

B/ For the MARPOL Protocol:

The most significant modification brought about by the MARPOL 78 Protocol to its parent Convention is considered to be the incorporation of very important technical provisions.

These encompass the following:

a) A new definition of "new and existing tanker" vis-a-vis a "new and existing ship" as defined by MARPOL 73. The definitions are summarized in the Table hereunder:

<table>
<thead>
<tr>
<th></th>
<th>MARPOL 73</th>
<th>PROTOCOL 78</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILDING CONTRACT</td>
<td>31/12/75</td>
<td>01/06/79</td>
</tr>
<tr>
<td>KEEL LAYING</td>
<td>30/06/76</td>
<td>01/02/80</td>
</tr>
<tr>
<td>DELIVERY</td>
<td>31/12/79</td>
<td>01/06/82</td>
</tr>
</tbody>
</table>

Tankers and ships which do not conform with the above criteria are defined as existing.

b) The extension of MARPOL 73 Convention requirements for SBT is limited to tankers of 70,000 dwt and above to smaller crude oil tankers of 20,000 dwt and above and product carriers of 20,000 dwt and above, as earlier indicated.
The incorporation of the other systems viz CFT, COM, IGS and PL for various sizes of new crude carriers, existing crude carriers and for existing product carriers as previously indicated under Annex I, above.

2.3.5 How can the measures be applied?

APPLICATION OF IMO REQUIREMENTS TO OPERATIONAL AND ACCIDENTAL POLLUTION

Further to portraying, however cursorily, the amounts of oil discharged annually into the marine environment through operational and accidental pollution as well as their possible effects, including the steps already taken by IMO to remedy the ever-worsening situation through international instruments, it is appropriate at this juncture to examine how the said requirements could be applied so as to minimize pollution of the marine environment through operational and accidental pollution from ships.

Before this is done, it is worth mentioning that a lasting solution to the marine pollution problem can only come through the use of measures geared towards preventing pollution from happening and combating pollution when it does occur. This approach is necessary since prevention can never be 100 percent effective. As would be seen below, MARPOL 73/78 has covered preventive measures for operational pollution but has partially dealt with measures against accidental pollution. These include pollution prevention and abatement all of which have been taken care of to a large extent by other IMO instruments on marine pollution.

A) OPERATIONAL POLLUTION:

Operational pollution could possibly be checked through construction and equipment of ships and compliance with discharge control requirement by the maritime world.

The construction and equipment of ships must comply with technical specifications laid down in MARPOL 73/78 Convention.
It is required that oil tankers in particular be fitted with oily water separators and monitoring devices as well as the CBT, SBT, COW and the IGS systems, earlier examined.

For effective control of rampant discharges or disposal of pollutants into the marine environment by ships, the following preventive measures laid down in MARPOL 73/78 have to be strictly complied with by the international maritime community:

1) Special restriction for discharges or disposals within designated special areas

2) General restrictions for discharges or disposals outside special areas

3) Compulsory provision of adequate reception facilities in all port terminals and repair ports by all parties to the Convention.

B/ ACCIDENTAL POLLUTION

As previously stated, a lasting solution to accidental pollution can only be achieved through both the preventive and combative measures.

Prevention in this respect not only consist in proper construction and equipment of ships; but goes further to include proper crew training, efficient handling of dangerous goods and strict compliance with navigational rules, among others.

Other aspects of accidental pollution prevention closely connected with the aforementioned are technical designs aimed at limiting spills in case of damage to one or more of the cargo tanks. One of these is the requirement that segregated Ballast Tanks (SBT) be protectively located.
The other has to do with the concept of damage stability which holds that ships be constructed in such a manner as to be able to regain their stability while remaining afloat following damage sustained through such an incident as collision.

Pollution combating, in effect, is the last weapon against accidental pollution. What finally distinguishes the victor from the vanquished is the individual nation's ability to build up a well structured and organized contingency arrangements capable of operating effectively at the local, national, bilateral, multilateral and regional levels, as the case may be.

In order to be at liberty to intervene on the high seas for purposes of protection of national marine environment from pollution threats, there is need for coastal nations to procure such a right through ratification of IMO's 1969 INTERVENTION Convention.

2.3.6 HOW EFFECTIVE ARE THE MEASURES?

Finally, the effectiveness of the IMO instruments dealt with or referred to above, in reducing marine pollution can be assessed through studies carried out in 1973 and 1980 by the US National Academy of Sciences (NAS) on the evaluation of the amount of input of petroleum hydrocarbons into the oceans, summarized in Table 1, above.

The outcome of the studies based on the 1971 and 1980 data, respectively, indicates a rapid decline in the amount of oil entering into the marine environment due to marine transportation activities. The amount reduced from 2.7 to 1.5 million tons per year (approximately 70 percent) within that particular period.

Some of the reasons advanced for the decrease include the following:

1) The increasing awareness by masters and crews, shipowners and operators, of the existence of and the need to observe international rules on oil pollution.
2) A significant improvement in the provision of facilities in ports and terminals for the reception and treatment of oily wastes which ships have to discharge. Considerable tightening of surveillance and control of illegal discharges.

3) An increase in the price of oil in recent years resulting in more careful handling of cargo oil, with less oil remaining on board after discharge.

4) Increased use of crude oil washing which has made a significant contribution to the potential reduction of oil discharge.

5) Inclusion of cleaner seas provisions in Charter Party Agreements which has alleviated the economic disadvantages for operators to retain oily residues on board. (8) <+>

It is important to note here that there was and possibly is still a remarkable decrease in oil inputs into the oceans in spite of the ever-increasing shipping activities coupled with greater volumes of pollutants transported as a consequence, and as previously indicated by Table 1, thanks to the MARPOL 73/78 Convention and related instruments.

Optimistically, though, the NAS report on the 1973 workshop indicate that if the MARPOL 73 Convention requirements were strictly enforced, the amount of oil discharged into the sea would be reduced from 1.08 to 0.2 million tonnes per annum. Conversely, operational discharges without control would be as much as 6 million tonnes per year.

In conclusion, it could be said that strict enforcement of MARPOL 73/78 requirements which are much more stringent than those of OILPOL 54 and MARPOL 73 should result in reducing oil discharges to a lower degree than 0.2 million tonnes per year as well as reduce discharge and disposal of other pollutants into the marine environment to the minimum to the betterment of man and marine life.

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CHAPTER II

MARINE POLLUTION AND INTERNATIONAL ORGANISATIONS

The present chapter is an attempt to show that marine pollution is a global problem and that the international community through the United Nations and its organs as well as non-governmental organisations has recognized it as such and is working hard to ward off the danger.

The 1982 law of the Sea Convention provides for 12 nautical miles territorial waters and 200 nautical miles (n.m.) Exclusive Economic Zone, all measured from the baselines seawards, for coastal states. Beyond the 200 n.m. limits is considered to be international waters. These divisions are absolutely meaningless when it comes to controlling the movement of pollutants. The simple explanation is that pollution knows no national boundaries particularly in marine waters.

In effect, effluents discharged by one coastal State can inadvertently contaminate the waters of another simply through the transport by littoral currents. Also, ships are capable of directly polluting the waters of a coastal State by deliberate or accidental discharge of oil or other substances. Such discharges on the high seas are eventually carried inshore by currents.

This means that all coastal States regardless of their geographic location and regardless of whether or not they are producers of oil, gas, chemical substances or simply consumers, must join in the on-going struggle against the pollution. Even the landlocked countries that are either directly or indirectly involved in the exploitation of the marine living resources or in marine transportation or both must join in the save-the-marine environment battle, if the sustainable yield of the oceans and safety of same must be maintained.
From the foregoing, it is evident that the marine environment can only be protected from pollution through international agreements among countries bordering the oceans or involved in sea exploitation.

This is why the UN has made environmental protection one of its prime objectives.

3.1.1 THE UN:

Before assessment of the United Nations (UN) contribution to environmental care and protection is made, a rundown of its structure and objectives is deemed necessary.

The UN officially came into existence on 24 October 1945 following the ratification of its Charter by China, France, the United Kingdom, the U.S.S.R., the United States of America and by a majority of other signatories. Membership to the UN is open to all peace-loving nations that accept the obligations of its Charter.

3.1.2 ITS PREAMBLE

The prime objectives of the UN which represent the ideals and the common aims of all peoples whose Governments joined together to form what is now known as the United Nations are spelt out in its preamble which is here bellow adduced:

We the peoples of the United Nations determined

To save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind, and

To Reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small, and

To Establish conditions under which justice and respect for the obligations arising from treaties and other sources of international law can be maintained, and

To Promote social progress and better standards of life in larger freedom,
And for these ends

To practice tolerance and live together in peace with one another as good neighbours, and

To Unite our strength to maintain international peace and security, and

To Ensure, by the acceptance of principles and the institution of methods, that armed force shall not be used, save in the common interest, and

To Employ international machinery for the promotion of the economic and social advancement of all peoples,

Have resolved to combine our efforts to accomplish these aims.

Accordingly, our respective Governments, through representatives assembled in the city of San Francisco, who have exhibited their full powers found to be in good and due form, have agreed to the present Charter of the United Nations and do hereby establish an international organisation to be known as the United Nations.

3.1.3 **ITS STRUCTURE:**

The UN has six main organs, namely, the Secretariat, the General Assembly, the Security Council, the Trusteeship Council, the International Court of Justice, and the Economic and Social Council. In addition to these, are directly attached to the General Assembly, Principal Commissions, Permanent Commissions and Committees, Subsidiary Bodies and the International Atomic Energy Agency (IAEA).

The United Nations's set goals expressed in its preamble have got to be attained and in order to do this a number of positive measures have been adopted by the organisation. These include the establishment of treaties, conventions and other regulatory instruments, and the creation of Specialized Agencies and other Organs through the special organs and commissions.

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However, the issue here is specifically UN contribution to environmental protection in particular.

From the point of view of conventions and other regulatory instruments, a lot has been achieved. One of the most significant achievements that comes to mind is definitely the law of the Sea Convention which is generally viewed as an umbrella law for all other conventions and instruments regulating amongst other things safety of navigation, marine environment protection as well as the exploration and exploitation of the marine resources.

It is worthwhile to note in passing that the prime objective of the law of the Sea Convention has been the formulation of an acceptable formular for a fair partition of the ocean space which for centuries has been considered no man's territory, a view totally unacceptable to the bulk of the nations technologically disadvantaged.

Notwithstanding the divergences in opinions, the 1982 UN Conference came up with a more compromising solution based essentially on the following division of the sea:

I) Internal Waters:

Are waters on the landward side of the baselines of the Territorial Sea. They are to be administered the same way as land territory.

II) Territorial Sea (T.S)

Is measured 12 nautical miles seawards from the baselines and is under the sovereignty of the coastal States.

III) Contiguous Zone:

Is measured 12 n.m. from the Territorial Sea. It provides a policing zone for the latter;
IV) Exclusive Economic Zone (E.E.Z.)

It is measured 200 n.m. seawards from the baselines and is vitally important for economic reasons. Coastal States have sovereign rights over all natural resources therein for the purposes of exploration and exploitation, conservation and management as well as the exclusive right to construct and to authorize and regulate construction, operation and use of such artificial islands and other installations;

V) Continental Shelf:

It comprises the sea-bed and subsoil of the submarine areas that extend the T.S. throughout the natural prolongation of the land territory to the outer edge of the Continental Shelf Margin, or to a distance of 200 n.m. from the baselines. The coastal State has the sovereign right for the purpose of exploring and exploiting the natural resources therein and the exclusive right to explore and exploit the non-living resources of the sea-bed and subsoil.

In some circumstances, however, the Continental Shelf may stretch beyond the 200 n.m to 350 n.m. from the baseline. This is the case with wide margin countries like Nigeria, Canada, Argentina and Australia;

VI) High Seas (H.S.)

High Seas are areas of the sea falling beyond 200 n.m. from the E.E.Z. They are open to all States, coastal or landlocked. Coastal States are, however, required to ensure safety of navigation on the HS through ship registration and implementation of safety conventions;

VII) The Area:

The Area is the sea-bed and subsoil thereof beyond the limits of the national jurisdiction. The resources in the Area are considered to be "the common heritage of mankind."
Whilst Articles 206 to 212 of the Law of the Sea Convention deal exclusively with the different aspects of pollution and how to check pollution from occurring, Articles 212 to 225 examine ways and means of proper enforcement of pollution regulation by both the Flag States and Port States.

Article 211 is particularly dedicated to marine pollution from ships. It would be recalled that the MARPOL 73/78 Convention deals exclusively with pollution from ships. The MARPOL Convention could therefore be looked upon to a greater or lesser degree as an amplification of the present Article. This emphasizes the role of the law of the Sea Convention as an umbrella law.

The following adduction is from Article 211 above, and is indicative of the extent to which the law of the Sea Convention approaches the marine pollution problem:

"States, acting through the competent international organisation or general diplomatic conference, shall establish international rules and standards to prevent, reduce and control pollution of the marine environment from vessels and promote the adoption, in the same manner, whenever appropriate, of routeing systems designed to minimize the threat of accidents which might cause pollution of the marine environment, including the coastline, and pollution damage to the related interests of coastal States.

States shall adopt laws and regulations for the prevention reduction and control of pollution of the marine environment from vessels flying their flag or of their registry. Such laws and regulations shall at least have the same effect as that of generally accepted international rules and standards established through the competent international organisation or general diplomatic conference."
3.1.5 **OTHER INSTRUMENTS:**

Prior to the **Law of the Sea Convention**, the United Nations had adopted a certain number of Conventions and Treaty aimed at safeguarding the marine environment, the first four of which would be superceded by the 1982 law of the Sea Convention when it finally comes into force. These include:

I) The UN Convention on the Territorial sea and Contiguous Zones;

II) The UN Convention on the High Seas, 1958;

III) The UN Convention on the Continental Shelf, 1958;

IV) The UN Convention on Fishing and Conservation of the Living Resources of the High Seas, 1958;

V) The UN Convention on the Prohibition of the Development, Production and stock-piling of Bacteriological (Biological) and Toxic Weapons and on their distruclion, 1972; and

VI) The Antarctic Treaty.

Furthermore, the UN also acts jointly either with UNEP, IMO or IAEA or both as a responsible body for many Conventions and treaty instruments on environmental protection.

3.1.6 **SPECIALIZED AGENCIES OF THE UN:**

Moreover, the greater part of the UN's objectives is carried out by the Specialized Agencies of the Economic and Social Council. The latter is the arm of the UN responsible for the economic and social activities of the Organisation. Placed under the Economic and Social Council are Specialized Agencies and Subsidiary Bodies catering for various economic and social matters of the Organisation. The marine environment course is championed by IMO, UNEP, FAO, WHO, and WMO.
As mentioned earlier the other Organs of the UN deeply involved in environmental care include UNEP and IAEA. (See Appendix for the organisational structure of the UN).

3.1.7 MAIN FUNCTIONS OF THE SPECIALIZED AGENCIES IN THE FIELD OF POLLUTION:

A run-down of the main functions of each of the above mentioned organisations in the area of marine environment protection is deemed essential. However, IMO will be given a closer look given her total devotion to save the marine environment from pollution through promotion of safety of life at sea and the prevention of marine pollution from ships.

(i) The Food and Agriculture Organisation (FAO) has the responsibility of controlling and preventing marine pollution, as it affects living marine resources and fishing.

(ii) The World Health Organisation (WHO) is the international body with the responsibility for human health. It does this through protection of pollution from marine beaches and seafood,

(iii) The United Nations Environment Programme (UNEP) is responsible for all environmental aspects of pollution, including Marine Pollution. It has a Memorandum of Agreement with IMO as regards marine pollution.

In addition to above, the United Nations Development Programme (UNDP) has been actively involved in the marine protection programmes particularly in so far as it concerns provision of funds for such programmes and related technical assistance.

(iv) The World Meteorological Organisation (WMO) is essentially responsible for the atmosphere and pollution related thereto but has equally been quite active on sea-surface pollution problems, particularly if they arise from atmospheric input.
(v) The International Atomic Energy Agency (IAEA) has as its principal responsibility the co-ordination internationally of all matters pertaining to radioactivity. Her greatest concern here lies on the marine environment and the impact of radioactivity on the latter and living resources therein.

(vi) The United Nations Education Scientific and Cultural Organisation (UNESCO) is responsible for marine sciences and understanding processes related to marine pollution. The Intergovernmental Oceanographic Commission (IOC) of UNESCO was one of the UN agencies involved in marine pollution. Her involvement ceased with the formation of GESAMP in 1969.

(vii) GESAMP is the interagency Joint Group of Experts on the Scientific Aspects of Marine Pollution, formed in 1969. With the insertion of this group, all the UN agencies having groups dealing with marine pollution agreed to dissolve them and join GESAMP.

3.2 THE IMO:

The International Maritime Organisation (IMO) is concerned solely with maritime affairs, particularly the promotion of safety in shipping and the prevention of marine pollution from ships. At present it has a Membership of 124 States and one associate Member.

The Convention establishing IMO was adopted at the United Nations Maritime Conference in Geneva in 1948. The decision to establish the Organisation reflected the wish of the maritime nations to consolidate and improve on the diverse forms of international co-operation which had developed over the years in the shipping world. The Convention finally came into force in 1958, and the first IMO Assembly met in London in January 1959.

3.2.1 ITS MAIN OBJECTIVES:

The main objective of IMO is to facilitate co-operation among Governments on technical and related matters affecting shipping, particularly in the promotion of safety of life at Sea and the
prevention of marine pollution from ships. This is done through an extensive exchange of information between Governments in its organs and committees, the consideration and adoption of international agreements; and the provision of other advisory services and assistance to Government (9) ++

3.2.2 ITS STRUCTURE:

Structure wise and in broad terms IMO consists of the Assembly, the Council, five specialized committees and a Secretariat. The committees are: the Maritime Safety Committee (MSC), the Marine Environment Protection Committee (MEPC), the Legal Committee, the Committee on Technical Co-operation, and the Facilitation Committee. Some of the Committees are assisted by sub-committees.

i) The Maritime Safety Committee deals with technical matters within the scope of the organisation and connected with maritime safety, such as aids to navigation, construction and equipment of ships, rules for preventing collisions at sea, dangerous cargoes, life-saving appliances, marine radiocommunications, standardization of training, watchkeeping and qualifications of officers and crew, and search and rescue. The MSC is assisted by a number of sub-committees which are established to deal with specific problems.

ii) The Marine Environment Protection Committee is responsible for co-ordinating the Organisation's activities in the prevention and control of pollution of the marine environment from ships. The Sub-committee on Bulk Chemicals which deals with the Organisation's anti-marine pollution activities assists both the MEPC and the MSC.

iii) The Legal Committee is responsible for considering any legal matters within the scope of the Organisation.
iv) The Facilitation Committee is responsible for the activities and functions relating to the facilitation of international maritime traffic. The committee's activities are geared towards reducing the formalities and simplifying the documentation involved.

v) The Committee on Technical Co-operation is responsible for co-ordinating the work of the Organisation in the provision of technical assistance in the maritime field particularly in the developing countries. The technical assistance programme is designed to enable these countries to establish maritime infrastructures or to effectively develop their maritime activities. The technical assistance is equally aimed at enabling the countries to comply with the provisions and standards laid down in Conventions and other instruments.

3.2.3 TECHNICAL CO-OPERATION:

In order to attain its objective, the Committee has taken the following major steps:

a) Provision of technical assistance services through advisers and consultants stationed in the regions as well as at headquarters. They essentially deal with such matters as maritime safety administration, marine pollution, maritime legislation, training for deck and engineering personnel, technical aspects of ports, and carriage of dangerous goods.

b) Assistance in the provision of equipment and fellowships to developing countries, in particular. In most cases financial aid is provided by agencies like the UNDP, UNEP, and donor countries.

c) Establishment of the World Maritime University (WMU)
3.2.4 THE WMU:

The World Maritime University was established on the 4th of July, 1983 at Malmö, Sweden. The WMU is a global institution that offers professional training on the entire spectrum of shipping activities to maritime teachers, surveyors, examiners, general maritime administrators, technical managers of shipping companies, and technical advisers to Government Ministries. In addition to normal classwork, a substantial period of time is devoted to practical on-the-job training. The first two in-takes have been made up of students from developing countries. Future admissions will include students from the developed maritime countries as well. (10)

The University conducts a two-year and one-year courses and awards degrees and certificates. The two-year courses are in General Maritime Administration, Maritime Education, Maritime Safety Administration, and Technical Management of shipping Companies. The one year courses are designed for lesser technical officials engaged in maritime safety administration, and the lesser technical staff of shipping companies. Also, there are short courses, lasting four to six weeks on major developments in the maritime regulatory field resulting from IMO Conference decisions.

It is hoped that trainees from the World Maritime University should be capable of providing the professional knowledge or advice their Governments would need in the ever-changing world of shipping, thereby, substituting more or less the foreign experts and consultants whose services are often too costly for many of the developing countries.

Sounding the significance of the World Maritime University, Mr. C.P. SRIVASTAVA, Chancellor of the University (11) and Secretary General of IMO once declared,

../...
"Not only the developing countries will benefit from the special training at the University. The whole world system of maritime transport will be operated with greater effectiveness and safety, and this will result in clear and substantial value for all."

3.2.5 THE IMO SECRETARIAT:

The IMO Secretariat is headed by the Secretary General, who is assisted by a number of international civil servants operating in the various divisions of the Secretariat.

3.2.6 THE MARINE ENVIRONMENT DIVISION:

The division that is directly concerned with marine pollution prevention is the Marine Environment Division. It deals with the protection of the marine environment from pollution caused by maritime transport and related activities. The Division plans and executes project activity aimed at enhancing the ability of developing countries to prevent and control marine pollution and to mitigate its effects. The Division also co-ordinates the Organisation's work with the work of the United Nations Environment Programme and general UN matters concerning the environment.

Furthermore, the Marine Environment Division provides amongst other services the administrative secretariat and the Organisation's technical input to the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), and secretariat assistance to the Marine Environment Protection Committee. (12) ++

3.2.7 IMO INSTRUMENTS ON MARINE POLLUTION:

The establishment of technical co-operation programmes and the opening of the World Maritime University are certainly the most crucial and the most important steps towards realising the International Maritime Organisation's objectives. Yet, the best training would amount to nothing without the internationally
acceptable Conventions and other regulatory instruments. This is why IMO has in the last two decades promoted the adoption of some 27 Conventions and Protocols, and adopted a large number of Codes and Recommendations on various matters relating to maritime safety and the prevention of pollution.

Before considering IMO's Conventions and treaty instruments that directly deal with marine pollution, it is essential to note that the prevention of marine pollution is closely allied to maritime safety. For instance, a ship which never has an accident and is in the best state of seaworthiness will never be much of a threat to the environment. Consequently, safety Conventions such as:

- The International Convention for the Safety of Life at Sea, 1974 and the TSPP Protocol of 1978,

- Regulations for Preventing Collisions at Sea, 1972;

- International Convention on Load Lines, 1966;

- International Convention on Tonnage Measurement of Ships, 1969;

- International Convention for Safe Containers, 1972, as amended;

- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978;

- Convention on the International Maritime Satellite Organisation, 1979 (INMARSAT);

- Torremolinos International Convention for the Safety of Fishing Vessels, 1977;

as well as Codes, Recommendations and other safety instruments are also of great importance in preventing marine pollution.

Apart from the International Convention for the Prevention of the Pollution of the Sea by Ships, 1954, as amended, and the International Convention for the Prevention of Pollution by ships, 1973, as modified by the Protocol of 1978 relating thereto, already discussed in Chapter I, of this project, IMO has adopted many other Conventions and regulatory instruments relating to pollution prevention, and liability and compensation for pollution damage.

(i) For pollution prevention:

- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as amended;

(ii) For Liability and Compensation:

- International Convention relating to Intervention on the High Seas in cases of Oil Pollution Casualties, 1969 (INTERVENTION 69);

- Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, 1971;

- International Convention on Civil Liability for Oil Pollution Damage, 1969 and Protocol of 1969 related thereto (CLC 69);

- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (FUND 71);
iii) **PRINCIPAL CODES:**

- International Maritime Dangerous Goods Code (IMDG), (first adopted in 1965);
- Code of Safe Practice for Bulk Cargoes (1965);
- Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (1971);
- Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk (1975);
- Code for Existing Ships carrying Liquefied Gases in Bulk (1976);
- Code for the Construction and Equipment of Mobile Offshore Drilling Units (1979);
- International Bulk Chemical Code, 1983 (Second Amendment, SOLAS 74); and
- International Gas Carrier Code (Second Amendment, SOLAS 74).

The second set of amendments to SOLAS 1974 are expected to come into force on 1 July 1986. When this happens the IBC Code and the IGC Code will become mandatory.
Other forms of IMO's recommendations on marine pollution prevention include numerous guidelines and recommended practices.

MARPOL 73/78 Convention is seen as the most complete and the most advanced Convention on marine pollution. Yet, a study solely based on the MARPOL Convention is far short of giving a complete picture of marine pollution. The MARPOL Convention does not, for example, give answers to legal questions arising from pollution. This is why it is of absolute importance that pollution matters be viewed as well from a legal standpoint for a more complete apprehension of the pollution question.

3.2.8 IMO CONVENTIONS ON THE LEGAL ASPECTS OF MARINE POLLUTION:

An examination, however cursory, of three of IMO's Conventions on the legal aspects of marine pollution is, therefore, invaluable. These are the INTERVENTION 69, the CLC 69, and the FUND Convention 71.
i) INTERVENTION 69

The TORREY CANYON disaster in March 1967 revealed certain shortcomings in the existing international law regarding activities on the high seas which pose the threat of pollution. Questions were raised as to the extent to which a coastal State could take measures to protect its coastline where a casualty threatened that State with oil pollution particularly if the measures involved were likely to affect the interests of foreign shipowners, cargo owners and flag states.

The general consensus was that there was need for a new regime which, while recognizing the need for State intervention on the high seas in cases of grave emergency, clearly restricted such a right. As a result IMO convened a diplomatic conference in 1969 which adopted the High Seas Intervention Convention.

The latter affirms the right of a coastal State to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil or threat thereof, following upon a maritime casualty. The coastal State is, nonetheless, empowered to take only such action as is necessary, and after due consultations with appropriate interests including particularly the flag State, the shipowner, the owners of the cargo on board the ship in question, and the coastal State. It is only in the case of extreme urgency that the aforementioned procedural safeguards do not apply.

Notwithstanding, a coastal State which takes measures beyond those permitted under the Convention is liable to pay compensation for any damage caused by such measures.
The Convention has made provision for the settlement of disputes arising in connection with its application. The Convention applies to all sea-going vessels except warships or other vessels owned or operated by a State and used in Government non-commercial services. It entered into force in May 1975.

ii) CIC 1969

The other major issue brought to light by the TORREY CANYON incident and the more recent AMOCO CADIZ (1978) incident related to the basis and extent of the ship or cargo owner's liability for damage suffered by States or other persons as a result of marine casualty involving oil pollution.

The International Convention on Civil Liability for Oil Pollution Damage is actually aimed at ensuring that adequate compensation is available to persons who suffer oil pollution damage resulting from maritime casualties involving oil tankers.

The CIC 1969 IS BASED ON FIVE MAIN PRINCIPLES:

- The Convention is applicable when the territory (including the territorial sea) of a Contracting State is polluted. The nationality, domicile and residence of the defendant are therefore irrelevant. Also, it is not required that the shipowner be a national of a Contracting State or that the ship is flying the flag of a Contracting State;

- The liability is imposed only on the owner of the ship. This means that neither the servants or agents or other persons are liable under the Convention. The owner is liable irrespective of his residence or domicile. He is liable even if he comes from a State that is not a Party to the CIC. The Convention does not deal with bareboat charterers;
The Convention imposes strict liability upon the owner with only very few exceptions from liability. These include:

a) damage resulting from war or Acts of God;

b) damage caused by an act or omission done with intent to cause damage by a third party; and

c) damage wholly caused by the negligence or other wrongful acts of any Government or other authority in maintaining lights or other navigational aids.

The owner may also be totally or partially exonerated from his liability to a person that cause the pollution damage with intent to cause damage or by negligence of that person;

- The owner is entitled to limit his liability up to a certain amount if the incident has not occurred as a result of his personal actual fault or privity. The owner's liability can be limited to an amount of 2,000 gold francs (US dollars 139) per tonne of the ship's tonnage or 210 million gold francs (US dollars 15 million) whichever is the less;

- The owner has to ensure his liability. The owner of a tanker carrying more than 2000 tonnes of cargo oil is obliged to maintain insurance to cover his liability under the Convention. Tankers are required to carry a certificate proving the insurance coverage of the vessel. Also, any tanker carrying more than 2000 tonnes of cargo oil is required to carry this certificate, even when her flag State is not a Member of the CLC, when entering or leaving a port or terminal installation of a Member State of the Civil Liability Convention.

(*) The Unit of Account in CLC is gold francs.
In addition to the five principles, the following points are worthy of note:

First, damage caused by non-persistent oil is not covered by the CIC. This means that spills of gasoline, light diesel oil, kerosene, etc., are not construed to be within the scope of the Convention.

Second, only a spill from a tanker which is actually carrying oil in bulk as cargo is covered by the CIC. Any damage caused by a spill of non-persistent bunker oil, or by a spill from a tanker during a ballast voyage, is not regarded as being covered by the Convention.

Third, the CIC applies only after an incident has occurred in which oil has escaped or been discharged. It does not apply to pure threat removal measures, that is, when a successful preventive measure results in no actual spill of oil from a tanker. The CIC entered into force in 1975.

iii) FUND 1971

In spite of the fact that the Civil Liability Convention provided a useful mechanism for ensuring the payment of compensation for oil pollution damage, it did not deal satisfactorily with all the legal, financial and other questions which are of equal importance. Some participants at the International Conference which adopted the CIC objected to the regime established, on the grounds that it was based on the strict liability of the shipowner for damage which he could not foresee. On the other hand, some states felt that the limitation figures adopted were very likely to be inadequate in cases of major oil spills. The AMOCO CADIZ disaster proved their case.

As a result of these reservations, the Conference considered a compromise proposal to establish an international fund to be subscribed to by cargo interests.
The Fund Convention was therefore elaborated as a supplementary convention to the CLC and only those States who have become Contracting States of the CLC can become Members of the Fund Convention.

The main functions of the Fund Convention are to provide supplementary compensation to those who cannot get full and adequate compensation for pollution damage, and to indemnify the owner for a portion of his liability under the CLC. Furthermore, the Fund Convention is to assist a Member State to take preventive measures against pollution damage by giving advice or providing personnel, materials, and financial aid.

The Fund pays supplementary compensation to any person suffering pollution damage if the person cannot obtain full and adequate compensation due to one of the following reasons:

a) if no liability for pollution damages arises under the CLC;

b) if the owner is financially incapable of meeting his obligation and any insurance is insufficient to satisfy the claims for pollution damage; or

c) if the damage exceeds the owner's liability under the CLC.

The Fund is, nonetheless, relieved of its obligation to pay supplementary compensation if it proves that the pollution damage resulted from an act of war or if it was caused by a spill from a warship, or if the claimant cannot prove that the damage resulted from an incident involving one or more ships.

The Compensation payable is limited to an aggregate amount of 675 million gold francs (US dollars 47 million), including the sum actually paid by the owner under the CLC. The limit may, however, be raised to 900 million gold francs (US dollars 63 million) by decision of the IOPC Fund's Assembly.
The Fund indemnifies the owner for a portion of the aggregate amount of his liability under the CLC. The limit of indemnification is 500 gold francs (US dollars 35 million) for each tonne of the ship's tonnage, or 85 million gold francs (US dollars 6 million), whichever is the less.

The Fund is, nevertheless, relieved of its obligation to pay indemnity if it proves that the damage resulted from the wilful misconduct of the owner, or if it proves that, as a result of the actual fault of privity of the owner, his ship does not comply with requirements laid down in certain international conventions, and thereby causes damage as a result of non-compliance.

IOPC stands for the International Oil Pollution Compensation. The IOPC Fund is run by the IOPC Fund's Assembly.

The Fund is financed by contributions to be paid by all persons who receive crude oil or heavy fuel within the territory of a contracting State after Sea-shipment. The oil is counted for contribution purposes each time it is landed at port or terminal installations, irrespective of where it was loaded. It is irrelevant whether the oil came from another State, is being transferred from one port to another in the same State, or if it is being landed after offshore production.

Persons are liable for contributions if they receive more than 150,000 tonnes of oil in a calendar year, relevant for the contribution.

There are essentially two types of contributions, the Initial contributions and the Annual contributions. Initial contributions have to be paid in respect of contracting States on the basis of a fixed amount on each tonne of oil received. This amount is fixed at 0.4718 francs (or 0.4 US Cents) per tonne. Annual contributions could be raised when necessary and depending on the Fund's working capital which includes administrative expenses and anticipated claims.

The Fund Convention entered into force in 1978.
Amendments (1984 Amendments) have been proposed to both the CLC and the Fund Convention, the adoption of which will largely broaden the scope of the two instruments.

3.3 NATIONAL AND INTERNATIONAL ANTI-POLLUTION MEASURES:

Through the efforts of the UN, its Specialized Agencies, and Organs precited, a lot of progress has been and is still being made at various levels towards pollution prevention and abatement.

Nationally, preventive and curative anti-pollution measures are being adopted through ratification and implementation of pollution Conventions or treaties, or the establishment of national contingency plans or both.

Bilaterally, a lot of agreements have been established, in particular, between neighbouring States sharing common waters. The anti-pollution arrangements between the United States of America and Canada is a glaring example. Many of such agreements are actually being negotiated.

Multilaterally, and with financial and technical assistance, in most cases, from IMO, UNEP or UNDP, many agreements on marine pollution prevention have been signed by States sharing a common marine environment. The following is a list of some of the outstanding agreements:

3.3.1 OUTSTANDING INSTRUMENTS:


iv) Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention). Entered into force on 12 February 1978 and is ratified by the Mediterranean States and the EEC.


vii) Agreement Concerning Co-operation in Measures to Deal with Pollution of the Sea by Oil, 1971. Already in force. The Danish Government is the Responsible Body for the Convention.


3.3.2 REGIONAL ANTI-POLLUTION ARRANGEMENTS:

Regional agreements for co-operation in combating pollution in the cases of emergencies have equally evolved with anti-pollution programmes and a total of fourteen Regions have been designated by UNEP and IMO as pollution abatement centres.

.../...
Some of the agreements are already established while others are in the making.

The Regions are numbered as follows:

1. The NORTH SEA
2. The NORDIC AREA
3. The BALTIC AREA
4. The MEDITERRANEAN SEA
5. The KUWAIT ACTION PLAN REGION
6. The WEST AND CENTRAL AFRICAN REGION
7. The SOUTH EAST PACIFIC
8. The RED SEA AND GULF OF ADEN
9. The WIDER CARIBBEAN
10. The SOUTH SEA
11. The SOUTH PACIFIC
12. EAST AFRICA
13. The EAST ASIAN SEAS
14. LA PLATA

The anti-pollution arrangements for Regions 1, 2, 3, 4, 5, and 13 are already inforce. Those for Regions 6, 7, and 8 have been adopted but are not yet in force. For Regions 9, 10, 11, and 14, contingency plans are in the process of establishment.

3.3.3 THE SHIPPING INDUSTRY AND MARINE POLLUTION:

All along in this chapter the aim has been to portray the contribution of the international organisations to the on-going struggle against marine pollution. Governmental efforts have been dealt with more or less extensively but the contribution from the industry directly involved with the day-to-day operations of tankers, commercial fleet, drilling rigs, refineries, shipyards, etcetera remains veiled.
The industry in the present context stands for the private sector composed of shippers, shipowners, shipbuilders, oil companies, oil refineries, chemical industries, insurance schemes, etcetera. The actual implementation of the regulatory instruments, in this case, on pollution prevention and abatement lies solely in the hands of the industry. The subject under discussion would therefore not be considered fully treated without mention of the industry’s valuable contribution.

The following is a rundown of the bodies actively involved in pollution matters:

i) The International Association of Independent Tanker Owners (INTERTANKO):

Members own most of the world’s independent tanker tonnage. Oil companies and Government fleets are not eligible for membership. INTERTANKO is actively involved in market research and tanker, port and charter information, as well as in the promotion of marine safety and cleaner seas. It acts has a spokesman for its members before inter-governmental, governmental and other organisations.

ii) The International Chamber of Shipping (ICS):

ICS is an organisation of national shipowners association in 30 countries whose principal function is to provide a focal point for its membership for the formation of policy over a wide range of issues. This has to do principally with technical and legal matters and their communication to inter-governmental and governmental bodies. ICS is actively involved in promoting all aspects of tanker safety and pollution prevention.

iii) The International Association of Drilling Contractors (IADC)

is primarily concerned with the interests of worldwide drilling contractors engaged in both onshore and offshore operations.
In addition to drilling contractors, its membership includes oil and gas producing companies and manufacturers of equipment and machinery. IADC makes a significant input to the work of inter-governmental, governmental and other industry organisations on drilling matters. Deeply concerned with the protection of marine environment and the promotion of safety, IADC sponsors a number of educational programmes on the prevention of blow-outs and general protection of those involved in the drilling field.

iv) The International Petroleum Industry Environmental Conservation Association (IPIECA):

IPIECA is an association of oil companies and related organisations. Its function is primarily to act as a focal point for communication and consultation between the petroleum industry and the UNEP and other governmental bodies on the impact of petroleum operations on the environment.

v) The Oil Companies International Marine Forum (OCIMF):

OCIMF is an association of companies transporting crude oil and oil products by sea, including their loading and discharge. Essentially concerned with the safe conduct of these operations from pollution, OCIMF represents its membership before inter-governmental, governmental and other organisations. It also sponsors and conducts important research programmes concerned with oil transport and terminals, and has made a substantial contribution to the improvement of tanker safety.

vi) The Offshore Pollution Liability Association Limited:

Is responsible for the administration of the Offshore Pollution Liability Agreement (OPOL). This is an oil industry voluntary agreement under which operators active in exploration and production accept strict liability for pollution damage and costs of remedial measures. Parties to the agreement guarantee that in the event of individual default, claims arising from an incident will be met. Formerly, concerned with oil spills occurring in the UK offshore production sector, OPOL now
applies to countries in North Western Europe where offshore operations take place.


E+P Forum is an association of oil companies having an interest in offshore exploration and production. As a result of its strong commitment to the protection of the marine environment and the promotion of safety, the E+P Forum represents its membership before inter-governmental, governmental and other organisations on all aspects relating to the exploration and drilling for crude oil and natural gas as well as their production, treatment, storage and pipeline transport.

viii) The Protection and Indemnity Clubs (P+I Clubs):

P+I Clubs are mutual insurance for shipowners. Their prime function is to cover their members against third party liability which they may incur in the course of their operations and which could not be covered by ordinary hull and cargo insurance. The Clubs cover almost all the world's ocean going tanker fleet. Insurance is provided for a wide range of liabilities including liability for oil pollution.

ix) The International Tanker Owners Pollution Federation Limited (ITOPF):

ITOPF is an Organisation of Tanker Owners who between them own almost all the world's tankers. Its functions are to administer TOVALOP - to provide technical advice on oil spills; to conduct post-spill surveys; to provide consultancy services on contingency planning; and to maintain a comprehensive information service on oil pollution. ITOPF's most important activity today is to provide emergency advice on the scene of oil spills. In view of its wide experience, ITOPF is recognized worldwide as a leading centre of expertise in the field of oil spill emergencies.
x) The Tanker Owners' Voluntary Agreement Concerning Liability for Oil Pollution Damage (TOVALOP).

TOVALOP is a voluntary agreement between tanker owners to maintain a certain liability for oil pollution damage. It supplements the Civil Liability Convention by covering bareboat charterers, pollution arising from bunker oil of unladen tankers, pre-spill preventive measures, etc., all of which are not covered by the CLC. TOVALOP also maintains strict liability. TOVALOP and CRISTAL established in 1969 and 1971 respectively are interim industrial schemes for oil pollution compensation which will be replaced by the inter-governmental oil spill compensation schemes, the CIC and FUND Convention, once the latter have a world-wide application.

xi) The Oil Companies Institute For Marine Pollution Compensation Limited administers The Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL).

CRISTAL is a voluntary agreement among oil companies who contribute to the central fund on the basis of crude and fuel oil received by them by tanker. CRISTAL supplements the compensation for pollution damage available under TOVALOP, the CLC, and the national legislation. It is, broadly speaking, a voluntary counterpart of the IOPC Fund.

Nevertheless, whereas TOVALOP and CLC are Basic Compensations Provided by shipowners, CRISTAL and IOPC Fund are Supplementary Compensation provided by Cargo Owners if Basic Compensation is not enough.

3.3.4 INDUSTRIAL ORGANISATION AND THEIR MAIN AREAS OF ACTIVITIES:

The main areas of activities of the above mentioned industrial organisations can be divided as follows:
i) Pollution Prevention:
- IADC
- INTERTANKO
- ICS
- IPIECA
- OCIMF
- E & P FORUM

ii) Contingency Planning:
- IPIECA
- ITOPF
- OCIMF
- E & P FORUM

iii) Response to Spills
- ITOPF
- P & I CLUBS

iv) Compensation for Clean-up Costs and Pollution Damage:
- ITOPF (TOVALOP)
- OPOL
- CRISTAL
- P & I CLUBS

The international maritime community in general has tasted of the bitterness of marine pollution through several pollution incidents including those by the TORREY CANYON and the AMOCO CADIZ. Fully aware of the imminence of this danger which remains a threat to both mankind and the ecosystems, has through intergovernmental and governmental bodies, and the industry, made great effort to ward off the danger. Yet, the struggle will be of little or no avail if every nation does not join in the on-going struggle against this common enemy - pollution.
The fate of a "nation" infested with the pollution germ forms the basis for discussion in the subsequent Chapters.
CHAPTER III

4.1 MARINE POLLUTION, A MATTER OF GREAT CONCERN FOR CAMEROON.

4.1.1 PART A:

All along, in the previous chapters, marine pollution has been viewed from a broader perspective and portrayed as such as a global problem. Coming back home to Cameroon, the question is to what extent could marine pollution be considered a threat.

The answer is found in the close examination of the following factors:

- Geographical location
- Shipping activities
- Production, refinery and transportation of oil and oil products
- National interest to keep the marine environment clean and safe

4.1.2 GEOGRAPHICAL LOCATION:

The Republic of Cameroon is situated along the West African Coast, deep in the Gulf of Guinea between latitudes 2 and 13 degrees North. She is bounded by the Atlantic Ocean to the South-West, Nigeria to the West, Equatorial Guinea, Gabon and Congo to the South, Central African Republic to the East and Tchad to the North.

Cameroon has an area of 475,000 sq. Km, a coastline measuring 475 Km and a population of 8.6 million inhabitants.
The following points are glaringly indicative of the fact that Cameroon is most exposed to pollution hazards in the Gulf of Guinea region:

- Oceanographic studies carried out in the Gulf of Guinea show that Cameroon is located at a point of convergence of two major ocean currents, namely, the Guinea Currents from the West and the Benguella Currents from the South. These currents are capable of bringing pollutants from distant places.

- Off the Cameroonian coast, there is a major tanker route which originates from the Middle-East and passes through the Cape of Good Hope to Europe and America by way of the Gulf of Guinea.

- There is at present a substantial tanker traffic generated by oil exporting countries in the Gulf region - Nigeria, Gabon and Cameroon.

- The Cameroonian coastline is characterized by her enclaved nature, and

- The presence of the Malabo Island helps to stagnate current circulation along the Cameroonian coastline.

The following statistical information indicates more or less the density of tanker traffic through the West and Central African maritime region and the incidents that resulted therefrom between 1975 and 1980. It is worth noting that oil production in this region is centred around the Gulf of Guinea region which embraces Cameroon, Gabon and Nigeria, amongst others.

It has been estimated that as much as 586 million tons (MT) of oil are transported annually through the Cape of Good Hope. And West and Central African region exports 120 MT annually.
This gives a total of 700 MT of oil transported through the West and Central African waters each year. Half of this amount is carried in VLCCs (Very Large Crude Carriers) and the other half is carried in large tankers.

This means, roughly, that an average of 1765 super tankers and 5883 large tankers traverse the West and Central African maritime zone every year. It means also that 5 super tankers and 16 large tankers ply the West and Central African waters daily.

The relatively heavy tanker traffic resulted as it were in a number of casualties hereunder enlisted:

i) December 1975 MOBIL REFINER went into a collision around Douala and 45 tons of heavy crude oil were spilled

ii) April 1977 UNIVERSE DEFANCE had an explosion off the Senegalese coast and an unknown quantity of fuel n° 2 was spilled.

iii) October 1977 UNILUXT went aground in Nigerian waters spilling a substantial amount of crude oil. The quantity spilled is not known.

iv) November 1977 ARZEN while unloading at Cotonou caught fire and a total of 7 – 8000 M$^3$ of product oil were spilled

v) 1978 A tanker grounded near Cape Verde and spilled oil

vi) June 1979 PETRO BOUSCAT grounded near Kribi in Cameroon spilling 800 M$^3$ of oil
vii) 1979 + 1980

Four explosions and groundings resulting in oil spillages, were reported. (13) ++

The information above is far from being complete or accurate. It, nevertheless, gives the picture however blurred of oil transportation from and through the West and Central African region for a given period.

If a similar survey were carried out today the findings might to a lesser degree differ for various reasons stemming principally from fluctuations in the oil market and the coming into force of MARPOL 73/78 and other pollution and safety conventions. As previously indicated in Chapter I, the Conventions have had the effect of checking both the operational and the accidental pollution.

A word about the oil market fluctuation would probably explain why a similar study today on tanker traffic in the above region might differ from the afore stated findings.

Beginning from 1974 there was an oil boom that gave the OPEC Members (*) a golden opportunity to raise oil prices. In 1978 the oil prices were at the peak and fabulous profits were made. The oil boom attracted more and more investors into the oil business and a huge tanker fleet emerged. VLCCs and ULCCs were constructed indiscriminately without serious market prospection. The outcome is a foregone conclusion.

* OPEC - Oil Producing and Exporting Countries
As it were, the major oil consumers who are essentially the industrial nations finding it difficult, if not impossible, to meet the price hiking resorted to reducing their demand for oil and relying more on alternative energy sources. With a fall in demand, supply eventually toed the line and prices were forced to drop in the early eighties marking the beginning of the present recession. The latter resulted in the scraping and laying up of tankers particularly the largest sizes.

From the above analyses of the oil market and considering the present day trend of same, the following tentative conclusions can be drawn:

i) Averagely less than 5 supertankers and more than 16 large tankers daily ply the West and Central African waters today. Though scrapings and laying up are contributory, the prime reason is found in the growing tendency to build refineries closer to the oil fields rather than in consumption areas as was formerly the case. This has resulted in the transportation of greater amounts of refined products than previously and, conversely, in a relative reduction of the quantity of crude oil transported.

ii) The amount of oil transported annually from and through the West and Central African waters would most probably be greater than the 700 MT recorded in the seventies. The reason is found mainly in the fact that while many more oil producers have recently come into the scene, oil consumption has steadily increased, of late.

It is nonetheless regrettable that operational pollution which accounts for as much as 73 percent (NAS) approximately, of the total annual quantity of oil discharged into the sea due to transportation activities has so far not been accounted for; for the region in question. There is little wonder that tarballs are commonly found along the coasts of most countries in the West and Central African region.
4.1.3 SHIPPING ACTIVITIES

The Republic of Cameroon has, in essence, four main ports, a river port in the North of the country at Garoua and three other ports located in the coastal region at Douala, Kribi and Limbe/Tiko.

Of these, the Douala/Bonaberi port shouldering nearly 80 percent of the national seaborne trade is by far the largest and main outlet. It would be recalled here that nearly 90 percent of Cameroon's foreign trade is carried by sea.

The country is drained by several rivers that contribute more or less to transportation. These include among many others Sananga, Wouri, Mouno, Nyong, Ntem, Benoué, Mayo Kebi, Longone and Chari, Ngoko and Meme.

The number of craft of 25 gross registered tonnes (grt) and above registered and based in the aforementioned ports has been estimated at over 150 (1). These include general cargo vessels, oil tankers, dredgers, fishing trawlers, floating docks, pontoons, barges, tugs, pilot boats, lighters etc. There is in addition a fleet of over 400 pleasure craft based in the above mentioned ports. Other craft of less than 25 grt number hundreds.

Turning over the leaf to cargoes, Cameroon produces and exports cocoa, coffee, timber, Banana, palm products, cotton, hides and skins, tea, rubber, groundnuts, tobacco and sugar amongst others.

In mining, Cameroon produces more or less the following minerals: Bauxite, coal, iron, iron ore, nickel, platinum and gold.

(14) ++

* 1982 estimates.
Cameroon imports amongst other things the following: textiles, vehicles, engines, spare parts, chemical products, zinc, cement, flours, beverages, craft, fish, aluminium, lubricants, books, etc. (15) ++

The tables hereunder sum up on the one hand the total volume of imports and exports for the periods 1980/1981 and 1981/1982 and on the other hand the amounts of cargo handled in each of the ports for the same period.
### TABLE III

<table>
<thead>
<tr>
<th>1980/1981</th>
<th>DOUALA</th>
<th>KRIBI</th>
<th>GAROUA</th>
<th>LIMBE/TIKO</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPORTS</td>
<td>2,464,983</td>
<td>5,027</td>
<td>250</td>
<td>0</td>
<td>2,470,260</td>
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<tr>
<td>EXPORTS</td>
<td>953,039</td>
<td>195,039</td>
<td>0</td>
<td>25,572</td>
<td>1,174,226</td>
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<td>TOTAL IMPORTS/EXPORTS (FOREIGN TRADE)</td>
<td>3,418,022</td>
<td>200,642</td>
<td>250</td>
<td>25,572</td>
<td>3,644,486</td>
</tr>
</tbody>
</table>

### TABLE IV

<table>
<thead>
<tr>
<th>1981/1982</th>
<th>DOUALA</th>
<th>KRIBI</th>
<th>GAROUA</th>
<th>LIMBE/TIKO</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPORTS</td>
<td>2,760,777</td>
<td>3,361</td>
<td>3,991</td>
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<td>2,768,129</td>
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<td>EXPORTS</td>
<td>938,519</td>
<td>161,663</td>
<td>6,147</td>
<td>20,151</td>
<td>1,126,480</td>
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<tr>
<td>TOTAL IMPORTS/EXPORTS (FOREIGN TRADE)</td>
<td>3,699,296</td>
<td>165,024</td>
<td>10,138</td>
<td>20,151</td>
<td>3,894,609</td>
</tr>
</tbody>
</table>

* Tables III * IV are from the publication "Cameroon Inter-Ports" N° 23 of March 1983 published by the Cameroon National Ports Authority.
The above trade is carried by different types of ships of various sizes suitable for the transportation of the different kinds of goods. The vessels regularly call at the above mentioned ports for normal loading and/or unloading of the cargoes.

The table below is intended to show types and numbers of ships involved as well as the volume of cargoes shipped for the years 1980/1981 and 1981/1982, in tonnes.

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TONNAGE</td>
<td>Nº OF SHIPS</td>
</tr>
<tr>
<td>Cargos</td>
<td>1,646,858</td>
<td>740</td>
</tr>
<tr>
<td>Bananiers</td>
<td>77,171</td>
<td>57</td>
</tr>
<tr>
<td>Pétroliers</td>
<td>748,276</td>
<td>100</td>
</tr>
<tr>
<td>Pinardiers</td>
<td>16,213</td>
<td>12</td>
</tr>
<tr>
<td>Minéraillers</td>
<td>601,862</td>
<td>97</td>
</tr>
<tr>
<td>Butaniers</td>
<td>7,064</td>
<td>13</td>
</tr>
<tr>
<td>Bitumiers</td>
<td>18,054</td>
<td>12</td>
</tr>
<tr>
<td>Porte-Conteneurs</td>
<td>216,123</td>
<td>97</td>
</tr>
<tr>
<td>Ro/No</td>
<td>86,932</td>
<td>73</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,418,022</td>
<td>1,203</td>
</tr>
</tbody>
</table>

*Table from "Cameroon Inter-Ports" N° 23 of March 1983*
The rapid growth of maritime transport in Cameroon is rather remarkable, considering in particular the giant strides made over the last three decades.

In 1960 the total volume of cargo handled in the Cameroonian ports was 773,200 tonnes. In 1970, this volume nearly tripled to 1,842,500 tonnes and in 1980 it attained 3,644,486 tonnes, nearly five times as much.

On the side of the cargo fleet, Cameroon had neither ships nor a national shipping line in 1960. On 4 April 1975 the National Shipping Company (Cameroon Shipping Lines) was created and two second-hand general cargo vessels (CAM AYOUS 7,689 grt) and CAM-AZOBE 7,689 grt were purchased. Still in the seventies, the following general cargo vessels were ordered from shipyards and the conventional second hand vessels were sold:

- CAM - BUBINGA 9,066.74 grt
- CAM - DOUSSIE 9,066.74 grt
- CAM - ILOMPA 12,675.05 grt
- CAM - IROKO 12,675.05 grt

In 1984 two new and very modern multipurpose vessels were purchased:

- CAM - BILINGA 12,075 grt
- CAM - EBENE 12,075 grt

The Cameroonian general cargo fleet is in actual fact very young given that the oldest ship is barely 7 years old.
In order to be on the vanguard of recent technological advancements in maritime transportation and to adequately cope with the fast growing traffic, the port of Douala has been extended and modernized. New berths have been built and a modern container terminal has also been constructed.

Still in search of more facilities for shipping plans are underway for the construction of deep sea ports at Cap Limbo in the Fako Division and at Rocher de Loup in the Ocean Division.

These developments, however crucial they are to the economic life of the country, are a direct threat to the "new concept" of clean and safe marine environment. In other words, if concrete measures are not taken, on time, to prevent the marine environment particularly from accidental and operational pollution from ships, the said developments will undoubtedly work against the very economy it is aimed at promoting.

By and large, the pollution risk factor increases more or less proportionately with the traffic.

4.1.4 PRODUCTION, REFINERY AND TRANSPORTATION OF OIL:

The processes of production, refinery and transportation of crude oil and refined oil products present the highest pollution risk to the marine environment in Cameroon.

In order to assess to what extend the above mentioned processes are hazardous to the marine environment, the following shall be briefly examined:

i) Companies directly involved
ii) Location of oil fields
iii) Production, storage and transfer
iv) The refinery
v) Douala terminal
vi) Risk analysis
The companies involved either in oil exploration, production or refinery are hereunder enlisted. Details on individual company's participation will be discussed under Part II of this Chapter.

a) The National Refinery Company (SONARA)
b) ELF - SEREPCA (ELF)
c) PECTEN INTERNATIONAL COMPANY (PECTEN)
d) TOTAL EXPLORATION AND PRODUCTION CAMEROUN (TEPCAM)
e) MOBIL EXPLORATION CAMEROUN (MOBIL)
f) GULF OIL CAMEROUN (GULF)
g) Société Nationale des Hydrocarbures (SNH) (National Petroleum Company)

The actual production fields are located offshore West of Limbe precisely at Rio Del Rey area (Kole) and Lokele area (Mokoko-Abana).

Kole is located some 30 km from the nearest coast, 75 km from Limbe and has a water depth of 25 m.

Mokoko-Abana is 38 km from the closest coast, 90 km from Limbe, 89 air miles from Douala and has a water depth of approximately 30 m.

The distance between Mokoko-Abana and Kole is approximately 16 km.

In January 1984 when the research leading to the writing of this project was conducted, a total of 288 wells were drilled and daily production stood at 43,500 barrels (ELF 25000 B., PECTEN 12000 B. and TEPCAM 6500 B.) (x)

(x) 1983 estimates
For storage at the production sites, there are two tankers based at Kole:- OBERNAI (142,000 dwt) chartered or owned by ELF and flying a foreign flag, and MOUDI (111804 dwt) registered in Cameroon and owned or chartered by TEPCM.

PECTEN for the time being relies on TEPCM for storage facilities. PECTEN'S crude oil is therefore transferred from Mokoko-Abana through an 8" pipeline to Kole over a distance of 16 km where it is stored in MOUDI.

Generally the oil produced is temporarily stored in storage tankers from where it is eventually loaded into crude carriers for various destinations.

While some of the crude is exported directly from the production sites to different parts of the world, the rest is transported to SONARA for refinery. The bulk of the refined products is transported by coaster to Douala where it is stored, sold and/or distributed to different parts of the country principally by rail and road wagons.

The refinery is built onshore West of Limbe, at Cap Limbo, 10 km from Limbe Town. It has an annual capacity of 2,000,000 tonnes. The refinery is constantly supplied with crude oil, by a 50,000 dwt. crude carrier equipped with a retention-on-board system. It makes averagely 3 - 4 legs between SONARA and the field terminals every month. The bulk of the refined products is transported to Douala by an 8,000 dwt coaster product carrier.

In order to accommodate the tanker traffic, the SONARA terminal is provided with adequate facilities for berthing, mooring, transferring, loading and unloading for crude and refined products.

A mooring buoy approximately two sea miles offshore is linked to the onshore terminal by a sealine (30") for receiving crude oil and delivering fuel.

..../...
A second sealine (24") connecting the mooring buoy to the terminal makes it possible for tankers to deballast onshore.

In several occasions the floating flexible hoses connecting the mooring buoy to the terminal have ruptured at the time of loading or unloading causing spillages.

The gravest incident so far happened on August 29, 1982 when a hose failure resulted in the discharge of 1.098 tonnes of fuel into the sea. The spill spread over a distance of at least 20 km covering a large area and causing untold hardship to local fishermen, in particular. Although SONARA did everything possible to minimize the effect, extensive damage was done to several beaches including the Mile 6 Beach, which had to be abandoned for a couple of weeks.

The damage caused to marine life by the fuel and/or the dispersants used to fight the spill is not known. But there is little doubt that the marine life either suffered from the effect of the fuel or toxic dispersants.

The following is a chronological order of pollution incidents reported at the SONARA terminal since 16 May, 1981 when the refinery actually went into operation:

- September 2, 1981: 590 tonnes of refined product spilled.
- September 26, 1981
- October 30, 1981
- May 16, 1982
- August 29, 1982: 1.098 tonnes of fuel spilled
- September 17, 1982: 230 M³ of crude oil spilled
- October 5, 1982

../*/
As indicated above, the amounts of oil spilled is only stated for three of the seven spillages reported. The total amount of oil discharged into the sea following the three incidents is very close to 2000 tonnes. Four of the seven spills were reported to be relatively minor but their total input into the marine environment cannot be underestimated.

The Douala-Bonaberi port is provided with an onshore oil terminal used mainly for the unloading of refined oil products the bulk of which comes from the refinery at Cap Limbo.

For reception facilities the port is provided with a service boat that goes round the port collecting sludge, slop or ballast water from ships.

There is yet no processing plant for dirty ballast or other wastes for the port in question.

The silence of the Merchant Shipping Code on pollution matters has definitely contributed greatly to the insalubrity of the Douala-Bonaberi port area.

So far, no major spill has been reported, but several minor spillages have occurred. These were mainly caused by either the cargo fleet, the fishing fleet, the supply fleet or the service boats through regular operations.

Besides, the river runoff, urban runoff, sewage and garbage, constitute a major source of pollution to the Douala-Bonaberi port.

Notwithstanding, the greatest problem seems to be the inability to effect a quantitative assessment of the pollutants and their effect on the marine environment due more or less to lack of funds or technical knowhow or both. Without the knowledge of cause and effect, it is difficult, if not impossible, to predict the environmental and ecological consequences of various types of pollutants that may be present in the waters so as to come up with appropriate preventive and curative measures.

../...
Pollution risks involved in oil transfers and transportation within the national territorial waters are plentiful.

The transfer of crude oil from Mokoko-Abana to Kole over a distance of 16 km by a submarine pipeline entails pollution risks. As earlier mentioned, oil transfer between the SONARA shore terminal and the offshore mooring buoy has caused as many as seven spills in roughly three years.

There is equally a lot of risks involved in the transportation of crude oil between Kole and SONARA, and product oils between SONARA and Douala-Bonaberi port given particularly the high traffic density in the area. There is also the high probability of occurrence of pollution through operational, accidental or deliberate discharges either from tankers transporting oil within the territorial waters or from those transporting crude oil from the production fields to other parts of the World.

These risks go a long way to emphasize the need for preventive measures such as an efficient Vessel traffic control System (in channels and congested zones-, sufficient and appropriate aids to navigation along the waterways (buoys, light houses, beacons etc.), sufficient navigational equipment aboard vessels (nautical charts, weather charts, tidal tables, appropriate radio communication systems, radar(s), echo sounder, etc.), regular drainage of the Douala channel, and intensification of surveillance over the territorial waters.

The measures above would certainly reduce the chances of accidental and normal operational pollution within the territorial limits but the chances of pollution originating from the high seas or from a neighbouring country are pretty high, particularly for a country like Cameroon. The perpetual nature of the risk underscores the need for concrete counter-pollution measures.
NATIONAL INTEREST TO KEEP THE MARINE ENVIRONMENT CLEAN AND SAFE:

In order to fully comprehend why it is in the interest of Cameroon to safeguard the marine environment the following points shall briefly be examined:

- Nature of the coastline
- Nature of maritime transportation
- Effects of pollution
- Examples of nations and communities that have jealously safeguarded their marine environments.

i) Nature of the coastline

The Cameroonian coastline stretches from Campo in the Ocean Division through Douala and Limbe to Jabane in the Ndian Division covering a distance of 475 km.

In the Kribi maritime region the coastline is largely rocky but it has some of the most beautiful sand beaches in the West and Central African Region. At the mouth of the River Sananga the sea has been known to be fairly turbulent. However, the estuary provides an important nursery for fisheries and other marine life, making Kribi one of the major fishing grounds for the country. It goes as a matter of course that there is a sizeable number of fishing villages in the Kribi region. The latter is sparingly covered with mangroves especially when compared to the other regions.

The Douala region is characterized by a large urban population living close to the Douala/Bonaberi port built along the Wouri estuary. The estuary provides a copulating area for fisheries and has been exclusively reserved as such. Along the estuary there are a number of beaches and four yachting clubs. From the estuary southwards and westwards there are inhabited islands (Manoka, Kombo Mokoko, Kaiser Kombo, Cap Cameroon, Souellaba, etc.); lots of creeks; extensive mangrove forests and mangrove swamps; and, a host of fishing villages.
The Limbe region lies on the foot of the Cameroon Mountain (4070 m in height). The volcanic nature of the mountain has rendered a portion of the Limbe maritime region rocky. The rocky coastline stretches from Mabetta through Limbe town to Enyenge. There are, nonetheless, beautiful beaches such as the Dockyard Beach and the Mile 6 Beach. There are to be found in this region, inhabited islands such as Mbomo I, Mbomo II, Mboko I and Mboko II and the Bota Island. The refinery, as previously stated, is located in this region. The Limbe region also has numerous fishing villages.

The Ndian maritime region which in spite of her size and maritime activities remains to be considered an integral part of the Limbe maritime region, is exclusively covered by mangrove forests and mangrove swamps. The mangroves provide the region with a very healthy breeding ground for the ecosystems. The region by far exceeds the other regions in the number of canoes, local fishermen and fishing villages. It also has a complex and an extensive network of creeks stretching far inland.

Oil production, to-date is centred in this region at Kole and Mokoko-Abana.

The region excels too in the sea bird populations.

Generally, the Cameroonian coastline is characterized by indentations sometimes resulting in the formation of natural harbours and bays such as the Limbe harbour and the Man O’War Bay in the Limbe region. The nature of the coastline will certainly have an impact on national legislation with the coming into force of the New Law of the Sea Convention which considers inland waters as part of the land territory for administrative and legislative purposes.
Nature of Maritime Transportation:

Maritime transportation in Cameroon is both a function of wooden canoes ranging from four metres in length and above (hand paddled or engine propelled) and modern craft ranging from self propelled craft of approximately one tonne through barges and multipurpose vessels to tankers, the largest at present being MOUDI with 111804 tonnes deadweight.

Passenger transport along the coast, within the internal waters, and between Cameroon and Nigeria is predominantly a function of canoes. There are basically two explanations for this:

1. The nature of the coastline which as previously stated is characterized by indentations, creeks and small inhabited islands, favours to a large extent, canoe transportation.

2. The lack of cruise vessels; There are neither hydrofoils nor passenger ferries. This state of affair leaves the passengers with no other alternative if they have to travel by sea. There are however, at present, a number of intenders opting to undertake the business of coastal transport in Cameroon. This is expected to introduce ferry services for coastal transportation as well as international maritime and coastal transport between Cameroon and the neighbouring countries - Nigeria, Equatorial Guinea and Gabon.

This move, which is expected to enhance safety over and above other things is highly encouraged by the Administration which has issued Transportation Licences to potential applicants.

The physical structure of the Cameroonian coastline, the geographic location of the country, and the nature of the coastal water transportation, render the Cameroonian marine environment extremely vulnerable and highly costly if subjected to a major spill.
iii) Effects of Pollution:

In the subsequent paragraphs, an overview of possible pollution impacts on the Cameroonian Marine environment will be examined through a brief assessment of pollution effects on the following:

- Canoe transportation
- National and international traffic
- Mangroves
- Marine life and amenities

a) Canoe Transportation:

In the event of a major heavy crude oil spill within the coastal waters, canoe transportation system would be most affected. Given that heavy crude tends to smother any solid object it encounters, there is the likelihood that transportation by wooden canoes and small light craft would be rendered impracticable in circumstances of major heavy oil spills.

Considering that canoe transportation is of prime importance in the nation's system of coastal transport especially in the creeks where the latter constitute the main highways, on the one hand, between the fishing villages on the islands and those on the mainland, and between fishing villages in general and fish markets, on the other hand; a major spill affecting the creeks would possibly jeopardize transportation in the affected areas causing serious hardship to the population living or fishing in such areas.

b) National and International Traffic:

In effect, polluted waters are generally considered impediments to navigation.
A channel or port area polluted by either oils or other pollutants such as chemical substances, floating logs, wrecks, garbage and sewage would have the effect of reducing the volume of traffic in the particular port nationally and internationally. International traffic could be diverted to safer ports in the nearby countries to the detriment of the national economy.

c) The Mangrove:

Apart from transportation, the fate of mangroves in the event of a major oil pollution is a cause for concern in Cameroon and in many coastal countries in the tropics.

Mangrove is a term used to refer to approximately seventy species of trees which grow on sheltered shores and in estuaries or near-shore waters in the tropics and some sub-tropical regions. As previously stated the Cameroonian coastline is to a large extent covered with extensive mangrove forests and mangrove swamps.

Research on mangrove by renown ecologists and biologists indicate that the latter provides nurseries and feeding grounds for many commercially important species of fish and crustaceans. The stilt roots, the lower trunks and mud surfaces are said to usually support a varied fauna of oysters, snails, barnacles, crabs and a host of other invertebrates. The upper parts of the mangrove have been found to be essentially terrestrial environment with a varied but little known fauna of birds, mammals, and insects. Besides, mangrove trees have other domestic uses such as material for building, firewood, charcoal, source of tannin, and protection of coastline from erosion.

Many of the animal species found in the mangrove swamps are both very sensitive and vulnerable to oil and chemical substances. A major oil spill will possibly exterminate the highly vulnerable species such as plankton and invertebrates, breaking thus the food chain, or causing the migratory species like fishes to seek refuge in safe areas which may be in foreign waters. After all, fishes need no passports.
Furthermore, the behaviour of oil spills in the mangroves makes clean-up extremely difficult. Oil slicks are often trapped in the mangroves and the vulnerability of the latter to both oil and dispersants makes it difficult to deal with when polluted.

Moreover, the overall impressions following several observations on the effects of oil on mangrove communities carried out in Puerto Rico (1962), Panama (1968), Colombia/Ecuador (1976), Venezuela (1981), and the Gulf of Mexico and the Caribbean Sea (1981) indicate that in the short term there is high mortality of invertebrates, defoliation of mangroves, and death of seedlings. There were, however, signs of recolonization after a long period.

Similar spills in neighbouring Nigeria (1979 and 1980) in the Niger Delta caused extensive damages to mangroves.

The above analysis are indicative of the importance of mangrove forests, their vulnerability and risk of being exterminated to the detriment of man and the living marine resources.

d) Marine Life and Amenities:

In the first chapter of this project, it was established that, annually, operational pollution accounts for nearly 73 percent of the total annual oil inputs into the oceans through marine transportation whereas accidental pollution accounts for 27 percent, only (NAS).

It has also been established that the greatest number of pollution casualties occurs in coastal waters. Some of the reasons advanced for the incidents are: higher traffic congestion, and shallowness of coastal waters.

It means therefore that there are higher concentrations of pollutants in coastal waters than in the high seas. And, unfortunately, the most polluted areas happen to be the very areas which have otherwise been the most suitable copulating and feeding grounds for most marine species.
On the general impact of oil on the marine environment, both laboratory and field biological experiments have been carried out in many countries including Sweden, U.S.A., U.K. and Canada. The Canadian findings sum up more or less the general views.

It indicates that heavier oils have the ability to adhere to virtually all types of shoreline from bedrock to beaches, boulders, sand, and gravel. The lighter oils and more gaseous fuels tend to soak into the sediments.

Biologically crude oil or its by-products floating on the surface of water can cause widespread damage to marine life. Small oil particles, either ingested or on plumage, can kill birds. Oil smothers intertidal animals and plants, interferes with the normal feeding and respiratory mechanisms of fishes, in particular, introduces toxic components into the water column, increases the level of hydrocarbons in the marine food chain, and alters communities to a point of extreme ecological instability leading to mortality.

The following conclusions were drawn on biological and physical effects on marine environment based on a survey of literature on oil spills on a study region along the Canadian coastline: (17) ++

i) Oil and oil products should be regarded as poisons that damage the marine ecology;

ii) Marine resources can be endangered by a direct kill or by the long-term accumulation of petroleum hydrocarbons in the marine food web. The steady accumulation of oil in the marine environment may be far more serious than single large spills;

iii) Oil spills may present a public health hazard by increasing the level of carcinogenic hydrocarbons in sea water and bottom sediments, thereby increasing their concentration in sources of human food from the ocean;
iv) Dispersants introduce oil with its water soluble components into the water column. Toxicological studies have indicated that chemically emulsified petroleum are several fold more toxic than the same oils spilled on the water surface and naturally mixed by waves, winds and tides. Tarzwell (1970, in "Water Pollution by Oil", ed. P. Hepple) after carrying out fairly extensive tests on the toxicity of oils and oil dispersant mixtures, concluded that it was totally undesirable to use dispersants unless absolutely essential for final clean-up or protect waterfowl or damage to shore installations and beaches;

v) Acute toxicity of oil is largely due to the lighter volatile fractions that are evaporated or dispersed quickly in open water areas. Toxicity could cause widespread damage in the study region if oil arrived on intertidal areas; estuaries or shallow littoral zones shortly after spillage;

vi) The physical effects of oil (such as interference with normal feeding or respiratory mechanisms, or alteration of the substrate on which animals live) could cause widespread damage to intertidal organisms, birds and juvenile fish;

vii) Marine-associated birds would be severely affected by a major oil spill;

viii) Where oil was allowed to reach the shore, intertidal organisms would be severely affected. Although many of these organisms would recover, the effect of chronic pollution could lead to a reduction in the diversity of species and a greatly increased tendency to ecological instability;

ix) The eggs and juvenile stages of fisheries resources are extremely vulnerable to oil pollution. Herring spawn and larvae and juvenile salmon could be adversely affected.
The biological effects on the marine life by other pollutants (noxious liquid substances, DDT, BCBs, phosphates, heavy metals etc.) are certainly much more devastating considering their higher degree of toxicity and more poisonous effects.

It is however, not easy to predict the biological effects of a spill, particularly an oil spill from laboratory toxicity tests or from information gained from previous spills elsewhere. The reason is that the type of oil spilled, the environmental conditions at the time of the spill, and the degree and duration of confinement of the oil vary from one environment to the other making it difficult to generalise results obtained in a particular geographic region. The truth, nevertheless, remains that pollutants are a time bomb on which sits humanity and the ecosystems.

The environmental problems in Cameroon are even much more accentuated when compared with other countries in the Gulf of Guinea. The greatest danger lies in the Doual-Bonaberi port located 24 km from the mouth of River Wouri at a point where the tidal exchange is low making water replacement in some parts of the port totally impossible. A major spill in the port area would be catastrophic especially to the living resources therein.

Examples of Nations and Communities that have Jelously Safeguarded their Marine Environments:

Man is affected by his environment the protection of which is absolutely necessary if man's living conditions must be improved upon. This is why environmental care is a priority project to many a nation, today. Notwithstanding, the degree of concern for the marine environment, in particular, varies from nation to nation and from community to community. The main reasons for these differences are: first, the vulnerability and traffic conditions characterizing some areas, and second, the greater awareness of the environmental problems and the concern for a clean and safe environment shown by some nations as compared to others.
Under the MARPOL 73/78 Convention, areas most vulnerable from the point of view of ecology or traffic or both are commonly referred to as "Special Areas". Within the latter, there is total prohibition of discharge of any pollutant other than oil. Nonetheless, the oil content of any discharge must not exceed fifteen parts per million of water (15 ppm).

Some nations and communities knowing precisely the importance of a clean marine environment for the present generation and generations to come, have gone even a step further to legislate more stringent regulations over and above the internationally acceptable rules laid down principally by IMO in her pollution and safety instruments. Sweden, Canada, and the United States of America amongst others, are living examples.

As earlier indicated in Chapter I, the Baltic Sea Area is one of the five Special Areas recognized so far by the MARPOL 73/78 Convention. In order to protect the Baltic Sea from pollution, the seven Baltic Sea States (Sweden, Denmark, West Germany, East Germany, Poland, USSR, Finland) signed the Helsinki Convention in 1974. The Convention was the first of its kind to take into account all possible sources of pollution, i.e. land, atmosphere and sea.

As if the 15 ppm allowable discharge were less stringent, Gothenburg Hamn, the Swedish largest and principal oil port has been provided with oil treatment plants the effluents of which range between two and four parts per million. To ensure that nothing escapes into the marine environment, sewage as well as oily wastes from ships, petrol and gas stations, streets and repair ports and stations, are collected and treated.

Administration inspects the plants from time to time and on regular basis tests oily water samples prior to and after treatment to ensure strict compliance with the set requirements.
Canada is not yet a party to MARPOL 73/78. Nevertheless, the Canadian legislation totally prohibits the discharge of oil or oilywater into the Canadian waters. When Canada becomes a party to MARPOL 73/78, the zero parts per million discharge criterion may be more or less relaxed but there is no slightest indication that rules governing navigation in the Artic region, North of Canada will be affected. The simple explanation is that the Artic region has peculiar climatic conditions characterized by heavy snow, severe storm, vulnerable marine life and persistency of pollutants likely to be discharged. There are, as it were, special regulations under the Canada Shipping Act for the design and construction of ships intended to ply the Artic region as well as a total prohibition of any discharge within the Artic region.

The United States of America is a party to the MARPOL 73/78 Convention and is well known for her rigorous enforcement of the MARPOL 73/78 requirements. Yet, the community of Seattle, because of her great concern for the cleanliness and safety of her marine environment, decided to make even more stringent regulations for the Seattle Port area. Calling at the Seattle Port is subject to complying with both the national and the Seattle community set standards.

Considering Cameroon's location, the nature of her coastline, as well as the vulnerability of her ecosystems, there is little doubt that her marine environment also requires special care.

4.1.6 ECONOMIC IMPACT:

The prime reason, as a matter of fact, behind the desire to maintain a clean and safe marine environment is the latter's significant contribution to national economy.

As earlier indicated, the marine environment provides the Republic of Cameroon with four main economic factors; Transportation, oil and gas, tourists industries, and fisheries.
In order to elucidate how vital the marine environment really is to Cameroon's economy, the fisheries industry which employs a sizeable portion of the population will serve the example. The industry, as it were, is basically divided into two sectors, namely the traditional or artisanal and the industrial sectors.

i) Traditional Sector

Traditional fishing is as old as the very existence of the coastal ethnic groups in Cameroon. Fishing for the coastal population has been and is still, to a large extent, a way of life and livelihood.

Traditional fishing has evolved less significantly with time. Little or no modern technology is employed to catch or to preserve the catch. The traditional fishing fleet is essentially composed of wooden paddle-propelled canoes of various sizes ranging from four to about fifteen metres of length. With the advent of the outboard engines part of the fleet has of late become engine propelled. However, the bulk of the fleet has remained paddle-propelled given the unsuitability of engine-propelled canoes for the catch of smaller species like crayfish and lobsters found in shallow coastal waters.

The total fleet employed in the traditional fishing sector has been estimated at over 16,000 of which 1,400 are engine-propelled.

Since it is not possible to sell all the fresh catch at once, most of the catch is preserved through smoking. Given the lack of control over the local fish catch and commercialization of same, it has not been possible to determine the exact annual catch. However, there is a rough estimate of between 60,000 and 75,000 tonnes annual production of essentially smoked fish.
There are over 40 fishing villages along the Cameroonian coast. Some of these are heavily populated. Bekumu peninsula formerly known as Ubenikang, for example, has a population of over 13,000 inhabitants. (*)

As it were, the total number of people engaged in traditional fishing has not been clearly defined, nonetheless, rough estimates put it at 30,000 fishermen.

Given the sizes and quality of the traditional fishing fleet, it is hazardous for the latter to operate far from the coast. Being as it were confined to the coastal areas, the traditional fisheries' industry would suffer most from pollution affecting such waters.

ii) Industrial Fishing:

Industrial fishing is the reverse of traditional fishing. It employs modern craft, equipment and technology in fishing and preservation of the catch.

Industrial fishing is currently operated by four firms, namely:

1. CRECAM
2. CHALUTCAM
3. COTONNEC; and
4. PECAM and COPEMAR, which have merged in a partnership.

The other four: ATLANTIC FISH, SILVER FISH, NOPECAM and SOCAPROMA, have either wounded up or are simply in a recession.

(*) 1983 estimates
There are at present 41 (*) fishing trawlers, 20 of which measure 24 metres and above, in length. These twenty would be required to meet the requirements of the TORRIMOLINOS Convention on fishing vessels when Cameroon would have ratified the Convention and when the Convention would have come into force.

Over 530 crews are regularly employed to man the fishing vessels. The onshore employees number approximately 354.

Industrial fishing therefore employs nearly 884 people most of whom are nationals.

The total catch for the period 1981/1982 was as follows: (18) ++

Fish - 22,648,224 kg
Prawns - 281,021 kg

During the same period 28,050,543 kg (2) of fish were imported. This is a clear indication that the catch was by far short of meeting the local market demand. It also brings to light the fact that fish consumption in Cameroon is pretty high. Fish consumption is, in effect, only rivaled by that of beef.

On the other hand, a large part of the prawns produced was exported. The total exportation for 1981 and 1982 amounted to 398,202 kg. (19) ++

Looking at the fishing industry, fish consumption, and fish importation in Cameroon, it is not an exageration to say that a major oil spill affecting the coast and major fishing grounds will result in serious socio-economic problems.

The intention in this project is to give a broad outline of the socio-economic impact or effect on people without going into monetary evaluation which is in itself difficult given the multi­ facet nature of the problem.

(*) January 1984
For instance, the economic costs of an oil spill are not measured simply by adding up the amount of money spent on the clean-up and the assessment of property damage. It is much more than that. The costs must be measured as well in terms of opportunities which are foregone plus decreases in the utility resulting from certain damages. These foregone opportunities are an important part of the real costs and damages of an oil spill and they can be very diverse in nature. They include production lost when resources are transferred to clean-up use, lost of leisure time, lost of recreation values, reduced utilization and enjoyment of marine resources, and many other uses of the marine environment which would be precluded for a period of time.

A major spill will result in some or all of the following economic effects:

i) Balance of Payment Deficits

As earlier indicated, the amount of congelated imported fish is nearly the same as that produced locally (1981/1982). A sudden drop in the national production of fish will result in a similar drop in the supply. To avoid severe shortages that may call for price escalation, doubling of the quantity presently being imported might prove indispensable. This implies spending more hard currency to the detriment of the Balance of Payments. If at the same time prawn catch drops affecting export of same, it would mean losing foreign exchange at the expense of the balance of payment deficits.

Moreover, for clean-up and other more technical services, special equipment and expertise would be sought for from abroad at fabulous sums, still to the detriment of the balance of payment.
ii) Unemployment:

A major spill will put the nearly 900 employees of the industrial fishing and the approximately 30,000 self-employed artisanal fishermen out of jobs. Furthermore, fish dealers, fish transporters, and other subsidiary industries depending on the local fishing industry will also go jobless. All these will definitely result in major social problems particularly if the situation persisted for several months.

In Canada, it took over seven months to clean-up polluted waters and beaches following the KURDISTAN disaster that ended in the discharge of some 8000 tonnes of crude oil off the coast of Nova Scotia. Although the cold weather conditions contributed extensively to slowing down the clean-up processes (biodegradation, photo-oxidation, etc.), a similar spill in the tropics and under normal tropical weather conditions would have taken at least four months, all other things being equal, to be effectively cleaned-up.

iii) Losses and Damaged Property Compensation:

This could be a major financial problem to the Government particularly if the source of pollution is either unknown or the polluter is insolvent. It would even be much worse if the country is not yet a Party to any of the compensation schemes precited.

iv) Environmental costs:

As previously stated, no hard and fast facts have yet been established on the long term effects of pollutants in general and oil in particular on the marine living resources and on human health.

..../...
By and large, findings through field and laboratory biological experiments have proven beyond doubts that oil is dangerous to many fauna and flora, in the short term. The long term effects of a contaminated marine environment to human health is certainly damaging. These negative effects are costly. The extermination of vital marine species will result finally in the breakage of the food chain causing a drop in the sustainable yield of the commercial fish populations at the expense of consumers and the national economy.

An unhealthy population will not only be less productive, it will also cost the Government huge amounts of money to effectively run health services for such a population, to the expense of other high profile projects such as education, industrialization, transport infrastructure, etc.

If a spill as described above occurred in Cameroon during the yatching season (December to May), affecting beaches, the tourist industry and recreational values will be subdued to similar socio-economic problems as shown above.

Nonetheless, the above case is only hypothetical. Nobody, in effect, would wish to experience in his life time a nasty pollution casualty, but probabilities of such an occurence are getting higher every new day in Cameroon. In a similar manner, the cost of combating spills increases each day.

The only watch-word is PREVENTION!
4.2. PART B:

4.2.1 A LOOK AT THE PRESENT STATE

This part is an attempt to scan the present situation and the anti-pollution measures in existence at various levels: Government, semi-private, and private sectors.

4.2.2 GOVERNMENT:

The Department of Merchant Shipping, the arm of the Ministry of Transport, responsible for the national maritime and inland transport, was created by the Presidential Decree N°76/161 of 22 April 1976 and amended lastly by the provisions of Decree 83-493 of 20 October 1983 organizing the Ministry of Transport. The latter vested the Department of Merchant Shipping (DMS) with the following responsibilities:

- formulating and implementing government policy relating to maritime and inland transport;

- relations with the relevant bodies of the United Nations and more specifically with the International Maritime Organisation (IMO) and the International Labour Organisation (ILO) with regard to the working conditions of seamen;

- the organization of maritime and inland transport;

- drafting international agreements relating to maritime and inland transport with the national bodies concerned;

- control of the conditions and functioning of the installations and equipment necessary for maritime navigation and transport;
- the prevention and control of sea and river pollution in conjunction with the bodies concerned;
- the equipment and running of maritime rescue services;
- conducting investigations relating to accidents involving commercial, fishing and recreational vessels and boats;
- policing maritime and inland navigation;
- the administrative and legal status of vessels;
- the social status of, disciplinary regulation for and the training of professional seamen for commercial and fishing boats (officers and sailors) as well as the working conditions on board ships;
- following up the files of Cameroon Shipping Lines, the Cameroon Handling Lighterage Company (SOCAMAC), the Cameroon National Council of Shippers, the Cameroon National Ports Authority and any other maritime or inland transport company.

The above functions are only attainable through a sound legislation and advisory and coordinatory services.

The principal law which regulates merchant shipping in Cameroon is the Merchant Shipping Code, Ordinance N° 62-OF-30 promulgated on 31 March 1962 by the President of the Republic by virtue of powers conferred on him by the country's constitution.

This umbrella law on maritime and inland transport based on the responsibilities of the Department of Merchant Shipping treats amongst other things safety of navigation, ship registry, and administration of seamen, but remains silent on pollution matters.
This silence is partially accountable for the fact that Cameroon has not yet ratified any of the marine pollution Conventions. To say the least, Cameroon is only a party to the Safety of Life at Sea Convention 1948 (SOLAS 48) which has long been superceded successively by updated versions: SOLAS 1960 and SOLAS 1974 and Protocol 1978.

There is, however, a growing concern these recent years on marine pollution which, as preindicated, has fast become a serious threat to the marine environment, ecology, and society. This threat has led to the efforts being deployed at present by the Department of Merchant shipping under the direction of the Minister of Transport, aimed at effecting ratification and implemention of the "most important" marine pollution and safety conventions.

Besides, government is currently carrying out the following anti-pollution programmes:

i) Identification of research on "Environmental Pollution Control" in the 5th Five-year Development Plan (section 19.2.6.3.) as a priority (20)xx

ii) Has ratified the Convention and its protocol for the protection and development of the marine and coastal zones of West and Central Africa. The convention is not yet in force (21)xx

iii) Is in the process of ratifying the 1983 Law of the Sea Convention.

IV) Has outlined plans in the 5th Five-year Plan for the development of national contingency plans. This being a high priority project, was given an immediate attention through a joint Departmental Committee of Ministries directly involved in pollution matters, charged with the elaboration of national contingency arrangement. See Chapter IV, Part III, for details.
4.23 SEMI - PRIVATE SECTOR:

i) NATIONAL PORTS AUTHORITY

The National Ports Authority is a simi-private organisation under the supervisory powers of the Ministry of Transport. All the national ports (river and sea) are administered directly by the National Ports Authority's Central Administration based in Douala.

Silence of the Merchant Shipping Code over pollution matters together with the fact that the Government of Cameroon is party to none of the marine pollution conventions has put the National Ports Authority in an awkward situation vis-à-vis pollution regulations in port areas.

Notwithstanding, the Ports Commander is working hard, trying to cope with the growing pollution problems within the national ports.

It would be recalled that the Douala/Bonaberi port shouldering 80% of the 90% of Cameroon's foreign trade by sea and serving at the same time landlocked countries of Tchad and the Central African Republic, is excessively trafficked and is most exposed to accidental and operational pollution.

Given, too, that the Douala-Bonaberi port is located between two industrial cities (Douala and Bonaberi) with a total population of over one million inhabitants, the amount of pollutants emanating from the industrial wastes, urban runoff, sewage, garbage, river runoff, repair stations and from oil, gas and chemical sustances terminals, could be alarming.

This problem is aggravated by the lack of proper onshore reception facilities and treatment plants.

The port is equipped with shore based radio communication facilities and a fire brigade both of which need to be improved upon for greater efficiency.
There are no proper arrangements for combating minor or major spills within the port area. The port Commander, however, counts on assistance from ELF SEREPCA, based in the Douala/Bonaberi port.

So far, the Douala-Bonaberi port has suffered from no major pollution incident.

By and large, the National Ports Authority is an active participant of the interministerial committee actually drafting the national contingency plans.

The Limbe/Tiko port are two ports built quite apart and jointly administered. Limbe port is a sea port which derived its name from Limbe Town. The Tiko port is built a good distance inland along a creek. Its current vessel traffic is nil. The bulk of Tiko port traffic is made up of canoes.

The Limbe/Tiko ports have a total of 20 craft of 25 grt and above.

For the year 1981/1982, the total amount of exports and imports handled in the Limbe/Tiko ports was only 21,151 tonnes. This is far too low when compared with the 200,000 tonnes, in 1963.

The ports have neither repair nor reception facilities. The ports, in short, are totally ill equipped. However, SONARA located 10 KM from Limbe Town and sufficiently equipped with reception facilities, fire fighting and salvage facilities could be called upon in case of an emergency. But the Tiko part of the port has not that possibility given her distance from SONARA.

It is, nevertheless, advisable that the Limbe/Tiko ports be provided with necessary safety facilities for self-protection.
The port of Kribi is an estuary port built along river Kienke and used mainly for the exportation of timber. There are approximately 26 craft of 25 gross tons and above based in the Kribi port.

Exports and imports handled in the Kribi port in the year 1981/1982 amounted to 125,024 tonnes.

From the point of view of safety, Kribi port is ill equipped. Considering the latter's remoteness from Douala and other centres from where assistance could be sought, it is strongly advisable that Kribi port be adequately equipped for anti-pollution and general safety operations.

ii) SONARA

SONARA was created by the Presidential Decree N° 73/135 of 24 March 1973. It is a mixed public and private corporation with an autonomous budget.

SONARA is a Hydroskimming Refinery which manufactures the following commercial products: Butane, Gasoline (ordinary and high octane), Kerosine, Jet Fuel, Gas oil and Fuel Oil. It has a tank farm of 30 tanks with a total volume of 450,000 m³ for the storage of crude oil, intermediate products, liquefied gas and finished products. It has, as well, an annual capacity of 2,000,000 tonnes.

There is no doubt that this huge and complex structure by its inherent nature is an embodiment of the most dreadful pollution and fire hazards to be imagined.

In order to meet the safety standards, the refinery has created amongst others, the Department of Technical services under which is placed the Safety Service charged with safety in and around the refinery.
For fire protection and fire fighting, the refinery has trained personnel and is equipped with both mobile (fire trucks, emulsion tankers) and fixed (water and foam lances, tank spraying fixtures, powder fire extinguishers), fire fighting equipment and materials.

For offshore fire fighting, search and rescue and spray of dispersants, two tugs (FRESCO and ETINDE) are fully equipped.

Regarding marine environment protection, the refinery is provided with adequate reception facilities: two tanks with a combined volume of 25,000 M³ for the collection of dirty ballast water, oily wastes and refinery effluents for subsequent treatment. The treatment is done in several stages and in a closed circuit. The oil content of the effluent from the treatment plant which is discharged into the sea is close to the 15 ppm mark set by the MARPOL 73/78 Convention.

Given, however, that most of the tankers that call at the SONARA terminal are either equipped with the Load-On-Top or the SBT systems, a small amount of water ballast is received.

On 31 January 1984 when the writer visited SONARA, only stocks of dispersants were in place for eventual pollution combat. There were no skimmers and the only 300 metres boom the company had was reported to be under repairs.

For communication with ships onshore/offshore and with the Douala/Bonaberi port, VHF channels 14 and 16, respectively, are used.

Private channels are used to communicate with the oil companies.
Considering her capacity, her degree of risk and the fact that since 16 May 1981 when the refinery went into operation, at least seven pollution incidents have occurred, it is evident that the refinery's anti-pollution arrangements are grossly inadequate.

iii) THE NATIONAL PETROLEUM COMPANY (SNH)

SNH is a national company that participates financially in the production and commercialization of oil and oil products, and gas. It protects Government's interest.

iv) CAMEROON PETROLEUM DEPOT COMPANY (SCDP)

SCDP was formed in the late seventies following the amalgamation of the petroleum depots in Cameroon. The company has depots at the port of Douala and at Bassa (Carrefour-AGIP). Light and heavy oil from the refinery at Cap Limbo are stocked at the depots for distribution to the following retailing companies: TOTAL, MOBIL, AGIP, BP, SHELL, etc.

SCDP has installed a system whereby oil can be separated from water by simple flotation. The recovered oil is retained and the watery effluent is discharged without further treatment. The oil contents of the effluent are never measured.

The above system is grossly inadequate and calls for the installation of proper treatment plants at the main depots.

4.2.4 PRIVATE ORGANIZATIONS: OIL COMPANIES

As would be recalled, there are actually five oil companies in Cameroon that fall under this category. Three of these (ELF, PECTEN and TEPCAM) have actually attained the production stage while the other two (MOBIL and GULF) are still at the level of exploration.
ELF SEREPCA

ELF-SEREPCA is a branch of the French petroleum. ELF is so far the biggest oil company in Cameroon and employs approximately 700 workers. The other branches of ELF are based in the neighbouring States of Nigeria, Gabon, Congo and Angola. ELF's operations in Cameroon commenced in 1977. Her production sites are located at Rio Del Rey area (Kole). With a total of 150 wells, ELF produces 25000 barrels of crude daily.

The production field is serviced by six supply boats. Plans are underway for the purchase of two new ones.

As measures against pollution incidents, ELF is furnished with a 500 m boom suitable for clean up operations at the high seas, and a newly acquired skimmer "CATAMARAN" with a recuperatory capacity of 25000 m$^3$ per hour. Most of the equipment are stored at the company's base in Douala. Additionally, 40m$^3$ of dispersants are in stock at ELF's base. Permanent stocks of 1 to 2M$^3$ are stored on each production platform in the field.

The supply vessels are equipped with both dispersants and fire fighting equipment.

The production platform, the supply vessels, and the base at Douala are linked through the VHF radio communication system.

Besides oil production, ELF is said to be undertaking a research project on currents in the Gulf of Guinea. The findings, it is hoped, would contribute immensely to the ongoing fight against pollution in the sub-region.
PECTEN INTERNATIONAL COMPANY (PECTEN)

PECTEN, a subsidiary of Shell Oil Company, a Delaware USA Company, is an operator of Lokele area with wells at Mokoko - Abana. PECTEN's operations in Cameroon began way back in March 1978, but production commenced roughly two years ago (1982).

In January 1984, 15 wells were drilled and production stood at 12,000 barrels a day. In the course of the year a maximum of 75 wells were expected to be drilled boosting production to an expected 25,000 barrels per day.

PECTEN's crude which is much heavier than ELF's, is collected in Platform "E" and pumped through a submarine pipeline to Kole where it is blended with ELF's crude and stored for further distribution.

Early January 1984, PECTEN had four supply boats all of which were equipped with radio communication facilities.

For fire fighting; water, foam, and dry powder are used. A diesel powered self contained boat with an efficient spray system is readily available.

For general safety, a rescue boat is kept in the field at all times in readiness for emergencies.

In preparation for pollution emergencies, PECTEN has a stock of dispersants but still lacks boats equipped with spraying devices. There are, nevertheless, plans to purchase a boat of that kind, a boom and possibly a skimmer, as well.
iii) TOTAL EXPLORATION AND PRODUCTION CAMEROON (TEPCAM)

TEPCAM established in Cameroon in 1979. The company operates in the Rio Del Rey area (Kole). In January 1984, TEPCAM had in operation two drilling jackets and six wells with a daily production capacity of 6,500 barrels.

In readiness for fire break-outs and oil pollution emergencies at the production sites, TEPCAM has two vessels equipped to carry out the dual functions of fire fighting and pollution combating. The latter are limited to the use of dispersants.

TEPCAM has a treatment plant with a closed circuit for oilywastestreatment. The oil content of the effluent from the plant is over 40 ppm.

TEPCAM having neither booms nor skimmers solely relies on other companies for assistance in the event of a major spill.

Her vessels (tanker and supply boats) are all equipped with the VHF radios. Walkie talkies are equally an important tool for communication.

For air transportation to the production sites, TEPCAM employs two chartered helicopters from HELI-UNION and a small craft.

Taking into account her production capacity which is most likely to be increased, TEPCAM is undoubtedly ill equipped for pollution emergencies.
iv) MOBIL EXPLORATION CAMEROON (MOBIL)

MOBIL is in partnership with TEPCAM and is presently carrying out oil and gas exploration.

v) GULF OIL

GULF, like MOBIL, is still at the exploration stage and is more or less unconcerned with pollution problems. Hopes are high for gas and oil production in the near future.

4.2.5 "THE_OIL_SPILL_CLEAN-UP_COMMITTEE"

SONARA, S.N.H, ELF SEREPCA, TEPCAM, PECTEN and MOBIL have entered into an assistance agreement for oil spill clean-up and emergency situations. The association is referred to as "The Oil Spill Clean-up Committee" or simply "Committee". The objectives of the "Committee" are twofold: increase and improve individual capability of preventing, containing and clean-up of spills, and provide the Members with a flexible organisation for conducting activities related to anti-pollution measures leading to environmental protection.

This "Committee" is expected to provide the nation with the strongest weapon for pollution prevention and abatement.
Putting all together, geographic location, shipping activities, production, refinery and transportation of oil and oil products, as well as fisheries, amenities, economic considerations and the present state of things, there is little or no doubt that the Republic of Cameroon is today, more than ever, faced with imminent danger from marine pollution and that she is beyond doubt ill-equipped and faces an environmental and economic threat. Her only hope lies, as it were, in the ratification and implementation of pollution and safety conventions as well as in setting up a well structured and organized contingency arrangements for pollution emergencies.
5. **CHAPTER IV**

5.1 **KEY MEASURES AGAINST MARINE POLLUTION**

5.1.1 **GENERAL INTRODUCTION**

After having identified the problem, i.e. marine pollution, the present chapter is geared towards suggesting effective ways and means of dealing with the problem. The solutions hereunder proposed are generally designed for developing maritime nations and specifically for the Republic of Cameroon.

This Chapter has been divided into three parts, each dealing with a measure considered sufficiently vital for an effective prevention and abatement of marine pollution.
5.2 PART I

5.2.1 GOOD MARITIME ADMINISTRATION

The importance of maritime transport to Cameroon cannot be over-emphasized. As indicated earlier, as much as 90 per cent of the nation's foreign trade is carried by sea. This means that land and air transport systems carry only 10 per cent of the whole. If the 90 per cent volume of foreign trade were converted into the rate of cash flow, the contribution of maritime transport to national economy, and in this case the balance of payments, will clearly be significant.

Besides, maritime transport has a secondary and exceedingly vital role in shaping the nation's economy through creation of jobs. Maritime transport, as it were, generates many subsidiary industries such as shipbuilding and repair yards, ship agents, stevedoring companies, shipping companies, shippers' councils, dock services, etc., all of which as a source of employment solves one of the greatest problems facing the entire world today.

The maritime sector in Cameroon is relatively young and comparatively less developed. If it were well developed it would, while improving on efficiency and safety of navigation for a better economy, create more jobs for the jobless. Such a development is hinged upon several factors:

5.2.2 PORTS AND PORT INFRASTRUCTURE

The business of shipping relies heavily on ports and port infrastructure. If a country has to succeed in shipping, great attention must be paid to ports and their infrastructure. Such ports must be properly located and their infrastructure must be sufficiently adequate to serve their needs.
Ports have been defined as places for loading and unloading of vessels recognized by the authorities. In providing landing places for ships, ports facilitate the movement of goods into and out of the country, thereby promoting both national and foreign trade to the advantage of the country's economy. Ports must be safe, easily accessible and economical to run if their role as safe landing places for ships must be adequately fulfilled.

For a port to meet the above conditions, the following factors have to be considered prior to its location:

i) Geographical location, both in the country and in relation to other national and international maritime traffic;

ii) Location with respect to other modes of transport;

iii) Location with respect to major national and international markets;

iv) Types of cargoes to be handled;

v) Types of ships the port is intended to serve;

vi) Possibility for future extension and/or expansion, etc.

In Cameroon it is the responsibility of the maritime administration, as organiser of maritime transport, to assist the National Ports Authority in port location and other aspects regarding port administration, port planning and port general infrastructure.

5.2.3 TRAINING

Modern shipping is based on advanced technology which is achieved through training. It is the duty
of every country taking part in sea transport her own maritime personnel required to manage and operate the shore administration with such transport. A country that entirely relies on foreign technicians for the running of her maritime transport is building mansions on sand.

Although it is generally considered most appropriate for maritime nations to establish national training institutions for the training of her nationals, it is many times uneconomic to spend huge amounts of money on such projects if similar training could be achieved elsewhere at a reasonable cost. If a country, as it were, chooses to train her nationals abroad, it is the duty of that country to ensure that proper training institutions are sought for and that necessary financial assistance is given to qualified candidates.

By and large, it is incumbent upon the maritime administration to plan such training.

5.2.4 GOOD MANAGEMENT

Management has been defined as follows:

a) The art of getting things done by people, or
b) An effective use of resources to achieve objectives. (23)

Management embraces planning, organizing, commanding, coordinating and controlling and applies to all sectors of the economy - public and private.

A country may be blessed with lots of resources but if that country suffers seriously from management deficiency, there is the possibility that mismanagement could deprive such a country from her riches leading her to poverty and misery. Good management is thus a key
issue in a country's economic development. It is equally the duty of the maritime administration, as organiser of maritime transport in Cameroon, to assist the shipping industry to acquire the required management skills. This again can only be done by a well-structured and organized maritime administration.

5.2.5 **CREATION OF SHIPPING COMPANIES**

A country could participate in shipping simply by providing services. It is however most appropriate and highly rewarding particularly for developing countries to establish national shipping companies. Such a move, though capital intensive, would ensure the country's full participation in the carriage of her foreign trade, creation of employment for the unemployed, security in times of crisis, prestige for the nation, etc. In Cameroon, the Merchant Shipping Department, as supervisor of national shipping companies, has to assist in the setting up and organizing of national shipping companies.

5.2.6 **GOOD SHIPPING POLICY**

Shipping policy in the present context is meant to be Government policy which while favouring investments in shipping makes such investments possible for both nationals and foreign investors through:

i) Establishment of a legislative framework that lays down stable and consistent shipping regulations and policies capable of winning the confidence of bankers and creditors over the long term, and which stabilizes mortgage operations and related matters.

ii) Establishment of a policy which seeks to facilitate shipping activities through elimination of lengthy bureaucratic controls which act as a deterrent to shipping which, by its inherent nature, demands quick decision-taking.
iii) Adopting a financial policy that allows the Central Bank to give loans to qualified investors at low interest rates and over long terms.

5.2.7 MARITIME LEGISLATION

Maritime legislation is a body of laws adopted or framed to control maritime activities. (24)++ It is generally based on safety of navigation, pollution prevention, crew matters, fishing matters, ship registration, mortgages, administration of wrecks, pilotage, offences and crimes, casualty investigation, salvage, safety conventions and related instruments, etc.

5.2.8 MARITIME ADMINISTRATION AND THE REPUBLIC OF CAMEROON

It is by and large the function of the maritime administration to draft and eventually enforce such regulations once they become law.

The above factors, as stated earlier, can only be achieved through a well-organized maritime administration. In this context, maritime administration means a Government body invested with authority and given the responsibility to organize and/or supervise the shipping sector.

In the Republic of Cameroon that Government body is the Department of Merchant Shipping (DMS). As indicated earlier under Part B of Chapter III, the Presidential Decree No 83/493 of 20 October 1983 invested upon the Merchant Shipping several responsibilities including inter alia:

- formulating and implementing Government policy relating to maritime and inland transport;
- the organization of maritime and inland transport;
- the prevention and control of sea and river pollution in conjunction with the bodies concerned;
- the administrative and legal status of vessels;
- following up the files of Cameroon Shipping Lines (CAMSHIP), the Cameroon Handling and Lighterage Company (SOCAMAC), the Cameroon National Council of Shippers, the Cameroon National Ports Authority and any other maritime or inland transport company; and
- relations with the relevant bodies of the United Nations and more specifically with the International Maritime Organization (IMO) and the International Labour Organization (ILO) with regard to the working conditions of seamen. (See Chapter III, Part B for the complete list of the responsibilities.)

Based on the above cited Decree, the mission of the Department of Merchant Shipping (DMS) is twofold. It includes at the same time and amongst other things maritime safety administration (safety of life at sea, safety of navigation and protection of the marine environment from pollution), and general administration and organization of the entire shipping sector, implying as a consequence that the DMS should be structured and staffed in a manner as to effectively and efficiently carry out her stipulated functions. A suitable personnel for such a Department should be composed of surveyors, economists, general administrators, lawyers, marine transport specialists, pollution experts, casualty investigators, statisticians, etc. It is most important that the DMS be given such an organizational structure that should make practicable the accomplishments of her defined responsibilities. A well qualified personnel as shown above will achieve very little in the absence of a good organization.
However, the DMS on whom lies the afore-mentioned functions, has been given the organizational structure hereunder, by the pre-cited Presidential Decree.
FIG. I: PRESENT ORGANISATIONAL STRUCTURE OF THE MERCHANT SHIPPING DEPARTMENT (MINISTRY OF TRANSPORT - CAMEROON).

MINISTER

DIRECTOR

ASSISTANT DIRECTOR

CENTRAL

CHIEF OF SERVICE SAFETY
  Assistant C/S

Navaigation Safety BUREAU

Policing & Maritime Rescue BUREAU

SERVICES

CHIEF OF SERVICE NAVIGATION
  Assistant C/S

Navigation BUREAU

Seamen's BUREAU

Maritime Certificates BUREAU

CHIEF OF SERVICE STUDIES & DOC.
  Assistant C/S

Supervisory BUREAU

Statistics BUREAU

Documentation BUREAU

Economics & Legal Studies BUREAU

CHIEF OF SERVICE ADM & FINANCE
  Assistant C/S

Personnel BUREAU

Budget & Equipment BUREAU

EXTERNAL

HEAD OF DISTRICT DOUALA
  Assistant H/S

HEAD OF DISTRICT GAROUA
  Assistant H/S

HEAD OF DISTRICT KRIBI
  Assistant H/S

HEAD OF DISTRICT LIMBE
  Assistant H/S

SUB-DISTRICT MANOKA

SUB-DISTRICT EDEA/MOUANKA

SUB-DISTRICT CAMPO

SUB-DISTRICT MOULOUNDOU

SUB-DISTRICT LOBE

SUB-DISTRICT BEKUMU

SUB-DISTRICT TIKO
Each of the maritime districts comprises three bureau, namely, the Navigation and Registration Bureau, the Maritime Safety Bureau and the General Affairs Bureau.

There is little or no doubt that the present set-up cannot effectively execute all the stipulated functions of the Department. There are, for instance, no clear provisions for effecting pollution prevention and contingency planning. There is, in short, no service or bureau directly responsible for marine pollution matters.

The present organizational structure of the DMS, in the writer's opinion, is grossly dwarfish considering firstly the size of the maritime sector and the prospect for future growth of same, and secondly the more elaborate and relatively complex structures of maritime corporations such as the Cameroon National Ports Authority, the Cameroon National Council of Shippers, the Cameroon Handling and Lighterage Company and the Cameroon Shipping Lines, the said Department has been called to organize and follow-up files.

There is therefore a dire need to give the DMS a structure befitting her defined functions. To arrive at an organizational structure as shown hereunder, the existing structure should be modified as follows:

i) The very important services, i.e. the Navigation and Seamen's Service and the Maritime and Inland Navigation Safety Service should be raised to sub-Departments.

ii) A sub-Department for Maritime Transport should be created.

iii) A Service for Pollution Prevention and Abatement should be created.
iv) Some Bureaux of the Central Services should be raised to Services.

v) More Bureaux should be created for both the Central and External services.
FIG. II: PROPOSED ORGANISATIONAL STRUCTURE FOR THE DEPARTMENT OF MERCHANT SHIPPING (MINISTRY OF TRANSPORT - CAMEROON)
**FIG. III:**

EXTERNAL SERVICES

- Head of Service
  - Douala
  - Garoua
  - Limbe

Pollution Control
- Bureau
  - General Affairs
  - Maritime Safety
  - Registration
  - Assistant
5.3 CREATION OF SUB-DEPARTMENTS

The raising of the Navigation and Safety Services to Sub-Departments is specifically called for by:

i) The need to create a Pollution Control Service and the Training and Examination Service, both of which are extensions of the Safety and Navigation Services and should naturally operate under their umbrella. This is only practicable if the Navigation and Safety Services are raised to Sub-Departments, as proposed.

ii) Given that the provisions of the afore-mentioned Presidential Decree did promote the Head of Maritime Districts from their former rank as Deputy Head of Services in the Central Administration to full Head of Services without, however, giving such Services full powers to act (for instance, they are only allowed to conduct inspections for ships whose gross tonnage is not more than 25 tonnes), implying thus the continued supervision of the Maritime Districts by the Central Services, it is but normal that the latter charged with such supervision be also raised to such levels as would permit them to continue to effect such duties, as has always been the case, without complex or conflict. Raising of the Navigation and Safety Services to Sub-Departments is hence a necessary measure.

5.3.1 FUNCTIONS OF THE SUB-DEPARTMENT OF TRANSPORT

The Sub-Department of Transport should be charged amongst other things with the following responsibilities:

i) Relations with maritime and inland transport companies and agents.

ii) Conducting economic, commercial and legal studies on maritime and inland transport.
iii) Organization of the shipping industry.

iv) Study of International Conventions and related instruments on shipping.

v) Cooperation with UNCTAD\(^\text{(+)}\) and related organs on maritime transport.

vi) Preparation of agreements on maritime transport.

vii) Planning the technical personnel needs of the maritime transport companies and bodies.

viii) General statistics and planning for maritime and inland transport.

ix) Collecting, storing and utilizing documents on shipping.

The Sub-Department of Transport should be assigned two services, namely the Study and Documentation Service and the Relations Service. Each of the services should have two Bureaux as indicated in the above organization chart. The functions of the Relations Service should include, amongst other things, relations with transport corporations.

5.3.2 **Creation of a Pollution Control Service**

Creation of a pollution control service is tantamount to responding to the status quo. If the Merchant Shipping Code, promulgated on 31 March 1962 fails to regulate pollution, the possible explanation is that in 1962 marine pollution did not pose a threat. But today, the circumstances have greatly changed. The population has increased, maritime transport has equally increased, and oil production has recently been introduced. There is every reason to create a service solely charged with pollution prevention and abatement.

\(\text{(+)}\) United Nations Conference on Trade and Development
The creation of a Pollution Control Service would revitalize the on-going struggle against marine pollution, bringing about a more rapid adoption and implementation of national and international marine pollution prevention and contingency planning measures both of which are totally indispensable for an effective control of marine pollution.

The marine pollution control service would therefore be charged with pollution prevention and contingency arrangements.

It would be necessary to split such a service into two bureaux, the one charged with pollution prevention and the other, contingency arrangements.

Generally the duties of the Pollution Control Service shall include, inter alia, the following:

i) Study of pollution Conventions and related instruments.

ii) Ratification and implementation of international pollution Conventions and related instruments.

iii) Preparation and execution of the National Contingency Plans in collaboration with the National Standing Committee on Emergencies at Sea.

iv) Mass education on marine pollution.

v) Cooperation with the oil industry in pollution matters.

vi) Scientific research on marine pollution in conjunction with the national bodies concerned.

vii) Bilateral and multilateral agreements on marine pollution prevention and abatement.

5.3.3 CREATION OF SERVICES IN CHARGE OF FINANCE, EXAMINATIONS AND TRAINING

The Budget and Equipment Bureau and the Maritime Certificates Bureau (formerly Examinations Bureau) should
be raised respectively to:

i) Financial Service, and

ii) Examinations and Training Service.

i) CREATION OF A SERVICE IN CHARGE OF FINANCES

There are basically two main reasons for such a move:

First, the functions of the DMS include, amongst other things, revenue collection, the bulk of which comes from fees charged for vessel registration and inspection as well as fines. Revenue collection is actually being taken care of by a Bureau assigned to the Administrative and Financial Service.

Furthermore, the DMS has as one of her functions budget preparation and management of same. Her budget covers amongst other things purchase and maintenance of office equipment, purchase of surveillance boats and safety appliances and maintenance and repairs of same; expenses on surveillance and control missions at sea, and travelling and more or less social security expenses for her employees. These functions are supposed to be carried out by another bureau also assigned, as it were, to the Administrative and Financial Service.

With the rapid growth of the maritime sector resulting, hopefully, in a similar growth of the DMS there is the likelihood that personnel management, mails services and financial matters will definitely be too much of a burden for the Administrative and Financial Service charged with such duties and might lead to ineffectiveness of the service. More so, financial matters will become more and more complex and shall definitely call for the services of a true financial set-up.
These underscore the need to create such a service to which the Bureaux in charge of revenues, budget and equipment could be assigned for better operation and control of the monetary matters in the Department.

Second, besides the normal financial duties mentioned above, such a service could be of great assistance to the pollution service on implementing pollution prevention and combating measures.

Such an assistance would include some or all of the following:

i) Purchase and maintenance of surveillance and control boats and accompanying safety equipment.

ii) Giving of technical advice to external services on the choice of equipment, purchase and maintenance of same.

iii) Active participation in the contingency planning meetings especially when such meetings have to do with equipment or related matters.

iv) Facilitation of surveillance and control missions by rendering the necessary financial services.

ii) CREATION_OF_A_SERVICE_IN_CHARGE_OF_EXAMINATIONS_AND_TRAINING

One of the most effective ways to prevent marine pollution is to ensure that ships are seaworthy. A seaworthy oil tanker, for instance, would normally not pollute the sea.

Seaworthiness has been defined as the sufficiency of a vessel in materials, construction, equipment, crew and outfit for trade or service in which it is employed. Any sort of disrepair in the ship by which it or the cargo if such as to make it difficult and dangerous to navigate the ship, overloading, all are breaches of the warranty of seaworthiness.
Training and examinations undoubtedly constitute a pivot on which is hinged seaworthiness. It has been firmly established, after all, that human error accounts for most of the marine casualties.

Proper training can without doubt lead to the sufficiency of a vessel through proper selection of materials and equipment, proper design and construction, good stowage, proper manning, adequate repairs and maintenance, etc., leading to safety of navigation.

The International Maritime Organization's Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention 1978) is the greatest effort ever made to attain on a global scale an acceptable standard of training, a standard of training that could possibly lead to global seaworthiness and safety of navigation.

It is up to the DMS to strive at attaining such a standard through setting up a service solely charged with examinations and training for the Department and related services.

The duties of such a service should include, inter alia, the following:

i) Programming and conducting examinations for the Central and External Services leading to the delivery of certificates of competency for the driving of engine-propelled craft (canoes, pleasure boats, etc.).

ii) Programming and following up of training schemes and refresher courses for the personnel of the Department and related services.

iii) Training schemes for ratings.

iv) Safety training for fishermen.

v) Safety training for seamen engaged in offshore production.
vi) Programming and follow-up of sea training leading to radio officers, chief engineers and masters.

vii) Programming and follow-up of training schemes for the entire maritime sector, leading to safety of navigation.

The Examination and Training Service should be assigned two Bureaux, viz: the Training Bureau and the Examinations Bureau.

5.3.4. CREATION OF BUREAUX

Creation of new bureaux has been considered vital. These include the mails bureau, the bureau in charge of mortgages, wrecks and aids to navigation and pollution control bureaux in the Maritime Districts. The following reasons justify such a move:

i) With the rapid growth the maritime sector and the DMS are actually experiencing, the mails section is getting larger and more complex, demanding as a consequence a better organization and a certain amount of responsibility from the personnel in charge necessitating, thus, creation of bureau under the Administrative Service and solely charged with the handling of mails.

ii) Given the importance every maritime administration attaches to the registration of mortgages, administration of wrecks and the provision and maintenance of aids to navigation, it is essential that a bureau charged with the pre-cited functions be created under the Navigation and Seamen's Service. The creation of such a bureau will add a new impetus to efforts actually being made to attain a higher level of safety.

iii) Creation of pollution control bureaux within the External Services is geared towards achieving the following:
a) provide external services with the means to deal with pollution matters or direct anti-pollution operations within the Districts, should need arise.

b) Provide maximum assistance to the Divisional Contingency Plans and to other divisional organizations dealing with marine pollution.

c) Ensure coordination of pollution control activities in the maritime regions.

d) Educate the public in the various Districts on pollution matters.

e) Promote anti-pollution activities in the maritime regions.

f) Ensure coordination and promotion of anti-pollution activities within the Sub-Districts.

g) Keep the Pollution Control Service regularly informed of the pollution situation in the Districts.

By and large, the ultimate goal of Part I of the present Chapter has not been to detail the functions of the Department of Merchant Shipping, it has been rather to highlight major structural and functional changes that may while leading to the attainment of the principal objectives of the Department, contribute sufficiently to pollution control.

5.4 WHAT MAY BE REAPED FROM THE PROPOSED ORGANIZATION

As it were, the implementation of the above proposed organizational structure is expected to bring about the following results:

i) With the more or less equal distribution of duties, the Director of the Department presently too heavily loaded with duties, will have time enough to coordinate the various services and to concentrate
more on very crucial matters of general interest regarding the Department and the entire maritime sector.

ii) The proposed structure would add more impetus to the DMS leading to a better and firmer grip on the organs of the shipping industry.

iii) Above all, the proposed structure would bring about efficiency, respect for the DMS and effective Government control over the maritime sector.

5.5 IMPORTANT CONSIDERATIONS

By the by, prior to putting forth the above proposals, serious thought has been given to the following factors:

5.5.1 FINANCIAL CONSTRAINT

The raising of some Services to Sub-Departments and creation of other Services and Bureaux is definitely a solution to unemployment, but it is, nonetheless, subject to serious financial considerations, given amongst other things the present economic recession that has plunged most nations including the Republic of Cameroon into financial crisis. It is for this very reason that the idea behind the proposed organization structure has been to attain the desired goals while remaining reasonably within reach of the difficult financial situation.

Such a move would nevertheless add some financial strain on the national budget, but it is worthwhile making it. Government might lose more by feeling too financially committed to give due regard to such an important investment. After all, it has often been said that it is more often expensive to be poor.
5.5.2 SIZE_OF_THE_MARITIME_SECTOR_AND_PROSPECT_FOR_GROWTH

Considering the role of maritime transport in the economic development of Cameroon, particularly as it concerns the carriage of foreign trade, already discussed in the preceding Chapters, it could be said that the Cameroonian maritime sector, as a whole, is still relatively small and less developed considering the volume of trade actually being generated in the country and the volume of trade that could otherwise be generated over and above the present volume.

There are, for example, the operation of passenger ferries and/or coastal services at the national and international levels which is presently lacking and which appears to have high prospects, yet unexploited, and transportation of crude oil and refined products actually being taken care of exclusively by foreign shipping companies.

Notwithstanding her small size, the maritime sector as a whole has undergone a very rapid growth within the last two decades and there are high prospects for future growth.

The DMS has equally evolved over the past twenty years but her rate of growth, it would appear, has not been in harmony with that of the rest of the sector. Her rate of growth, as it were, should normally keep pace with that of the shipping industry if she must accomplish her stipulated functions.

The proposed organizational structure, in the writer's opinion, is yet a medium-term development scheme since the anticipated growth in size and importance of the maritime sector will eventually and surely call for a much bigger maritime administrative body than the one in view.
5.5.3 MARINE ENVIRONMENT PROTECTION

It has been evidenced in the preceding Chapters that in Cameroon marine pollution has of late become a serious threat to the marine living resources, human health, national economy, etc. To overlook such a threat is tantamount to sitting comfortably on a time bomb.

In effect, setting up preventive and combative measures remains so far the only remedy for Cameroon and the entire maritime community faced with the pollution problem. It goes without saying that for Cameroon to be able to cope with the situation, the Merchant Shipping Department on whom lies that responsibility must be functionally and otherwise equipped for such a task. This spells the need for an administrative framework capable of handling pollution matters, as well as other aspects of shipping.

Nonetheless, there is little or no doubt that a solid organization structure, as has been proposed, for a maritime administration is already a great achievement considering that ratification and implementation of Conventions and related instruments cannot be fully carried out without the services of a good maritime administration.

A good maritime administration has rightly been considered to be a stepping stone to ratification and implementation of International Conventions. The stage has thus been set for the next part of the present Chapter dealing, as it were, with the ratification and implementation of pollution Conventions.
In the preceding paragraphs the importance and need for a good maritime administration for the Republic of Cameroon has been stressed. One of the prime functions of such an administration insofar as pollution control is concerned is ratification and implementation of pollution Conventions and related instruments.

The responsibility to ratify international conventions is essentially the duty of the Parliament. The implementation of such Conventions is in the main the duty of the Maritime Administration. However, there is need for close collaboration between the shipping industry and the maritime administration in order that both ratification and implementation may take place in good time.

Before this topic is closely examined, definitions of the following terms as used in the present context has been deemed necessary for a better understanding of the subject.

6.1.1 Definitions

i) Ratification:
   Confirmation (of an agreement) by signature or other formality.

ii) Implementation:
   Act of carrying an understanding, an agreement or a promise into effect.

iii) Convention:
   An agreement between States on maritime and related matters.

iv) Enforcement:
   The act of taking legal action (or threatening to do so) in the event of non-compliance with statutory requirements.
6.2 STATE OF CONVENTIONS

The need to ratify and implement IMO Conventions has been underscored by the IMO Assembly Resolution 500 which demands that a temporary stop be put on the introduction of new Conventions until the existing ones are fully implemented. The pre-cited Resolution is intended principally to assist coastal States, particularly the new maritime nations, to catch up with the traditionally maritime nations, most of which are developed countries, in the ratification and implementation or the adoption of Conventions and related instruments.

The present state of IMO Conventions vis-à-vis ratification and implementation by various Member States of the Organization is a clear proof of the above.

6.3 RATIFICATION AND IMPLEMENTATION PROCESSES

In order to understand in depth the processes involved in the ratification and implementation of Conventions, the roles generally played by the Maritime Administration, the Parliament and the Shipping Industry, shall be examined in the subsequent paragraphs.

6.3.1 THE MARITIME ADMINISTRATION

The Maritime Administration in the case of Cameroon is the Department of Merchant Shipping. It is the function of the latter to ensure that Conventions are ratified and implemented in the shortest time possible.

However, before Conventions are made available to maritime administrations for ratification and implementation, they are first of all drafted by IMO Committees and adopted by her Assembly. Following adoption, copies of the Convention are sent to Member States for eventual ratification and implementation.
In the case of Cameroon, copies of IMO Conventions are normally sent through the diplomatic channels to the Ministry of Transport, which in turn forwards them to DMS for study.

Generally, before a Convention is ratified, a detailed study of same is carried out. Such a study is essentially geared towards bringing out the advantages and/or the disadvantages that are likely to arise from the Convention whether or not it is ratified by the country in question. The maritime administration would normally forward such a study with concrete proposals to the Minister in charge for his opinion and instructions. If the country has more to gain than lose by becoming a party to such a Convention, the Minister would normally instruct that necessary measures be taken towards ratification.

If this be the case, the Maritime Administration would forthwith dispatch copies of the Convention and draft regulations based on the provisions of the Convention to various services concerned as well as to the different organs of the shipping industry for study and comments. The latter would more often than not look at the documents from the point of view of additional costs to be incurred as a result, not discarding, however, the safety element.

Their overall comments, if favourable, would speed up the ratification processes. The latter may differ more or less from one country to another. For instance, while preparation of regulations and instructions precede ratification in the United Kingdom, in Norway, preparation of regulations and instructions follow ratification.
i) **REGULATIONS**

International Conventions are not as a matter of fact binding on any country until they are enacted into the country's legislation, making their enforcement possible. The Convention may or may not spell out detailed requirements. It is up to the Maritime Administration to work out such details if they are necessary for effective implementation of the Convention. The details are generally referred to as Regulations. In some cases and under certain circumstances the regulations may be more stringent than the Convention itself. Nonetheless, while receiving any local colouring the Maritime Administration must ensure that the said regulations remain within the framework of the Convention.

ii) **INSTRUCTIONS**

At the national level, regulations are considered to be broad outlines lacking the very minute but important details. Such details based mainly on enforcement procedures are usually furnished by a more detailed and precise set of rules, known otherwise as instructions.

iii) **RATIFICATION**

Generally, to ratify is to confirm an agreement by signature or other formality. In the present context it means confirmation by signature of an agreement between States on rules governing the safety of navigation and protection of the marine environment.

Following the preparation of regulations and instructions, the Minister in charge of maritime affairs would then present the Convention to the Parliament for ratification (it is assumed here that the Administration in question has chosen to prepare
when Parliament ratifies the Convention, the country then becomes a party to it and the IMO Secretariat charged with the depository functions of IMO Conventions would be informed soon after. When the Convention finally enters into force, it automatically becomes law for the country in question and for all other countries parties to the same Convention. Enforcement is effected by the Maritime Administration.

6.3.2 **PARLIAMENT**

Parliament is a supreme law-making council or assembly found in countries with representative governments.

The prime objective of a Parliament is to pass bills or legislative proposals into laws. It goes without saying that legislative proposals (e.g. Conventions) can only become law when Parliament gives sanction to them.

6.3.3 **SHIPPING INDUSTRY**

The shipping industry as earlier indicated encompasses all the private or semi-private organs of the shipping industry (shipowners, shippers, shipyards, ship repair yards, oil companies, shipping agents, classification societies, etc.)

As far as implementation of Conventions is concerned, the shipping industry would be required to build safe ships and operate them with maximum care. This could be achieved through:

a) Proper design and construction of ships.

b) Effective operation of ships.
6.4 RATIFICATION AND IMPLEMENTATION OF MARPOL 73/78

In order to have an insight into the different aspects that may apply in the processes of ratification and implementation of Conventions, the case of MARPOL 73/78 will serve the example.

The MARPOL 73/78 Convention could be looked at from four different aspects, namely:

- the administrative aspect
- the legal aspect
- the technical aspect, and
- the economic aspect.

6.4.1 THE ADMINISTRATIVE ASPECT

Ratification and enforcement of the MARPOL 73/78 Convention would call for the services of a good maritime administration. Such a maritime administration, as earlier pointed out, is one that is sufficiently equipped to carry out such functions as ratification and implementation of Conventions, amongst other things. For the MARPOL Convention, the Maritime Administration must be capable of understanding the technical and administrative implications of the provisions of the Convention.
For the Republic of Cameroon there is need for a Maritime Administration such as the one proposed in Part I of this Chapter. It would be incumbent upon the MSD to ensure that the following measures are taken:

i) Necessary legislative procedures, as examined above, are taken to ratify and implement the MARPOL 73/78 Convention. These would include amongst others getting the shipping industry involved and seeking Parliament's approval within the shortest time possible.

ii) Establishment of a system of surveys and certification of ships, this in collaboration with the classification societies recognized by the Cameroon Government.

iii) Supervision of classification societies' work.

iv) Development of a system and procedure for the enforcement of MARPOL 73/78. This shall include the inspection of ships in ports and terminals, the detection of unlawful discharges and establishment of penalties to be imposed, the investigation of casualties involving spillages, and regular preparation and submission of reports and other information as called for by the MARPOL Convention to the IMO Secretariat.

6.4.2 THE LEGAL ASPECT

The ease with which Cameroon could effect implementation of MARPOL 73/78 would be predetermined by the existing laws and regulations governing her maritime sector. Such laws must be so flexible as to make allowance for any amendments. The laws must, in short, be accommodative. Otherwise, implementation of MARPOL 73/78, generally recognized as being highly
technical and subject to frequent modifications, will prove difficult, if not impossible.

The most recommendable way, in the opinion of the writer, is to render the Merchant Shipping Code much more accommodative by giving the Minister of Transport restricted powers to make regulations. This is generally done through an Enabling Act. An Enabling Act is an edict or act of Parliament which gives the Minister restricted rights to make regulations for his Ministry.

Such a move would hasten the amendment processes by eliminating the parliamentary procedures that are, more often than not, lengthy.

6.4.3 THE TECHNICAL ASPECT

Prior to ratifying the MARPOL 73/78 Convention, the MSD would need to have amongst its staff technical personnel knowledgeable in marine pollution matters and in the technical provisions of the MARPOL Convention such as the SBT, CBT, COW, PL, IGS, how they operate and how they can be controlled or verified.

It goes without saying that a well-qualified personnel is indispensable for an effective implementation of the MARPOL Convention.

6.4.4 THE ECONOMIC ASPECT

MARPOL 73/78 has been considered to be one of the most costly Conventions to implement. It demands a lot from both the Administration and the shipping industry.

Besides the administrative processes already discussed, there is the financial side which poses a serious problem to the shipping industry, particularly
retrofitting and provision of reception facilities have of late proven to be the most costly items.

6.4.5 RETROFITTING

Retrofitting in the present context is the process of transforming old ships, essentially tankers, to meet the MARPOL 73/78 standards by fitting them with one or more of the following systems: SBT, CBT, COW, PL and IGS. This being quite an expensive undertaking for the shipowners has led to numerous scrapping and laying up of a good percentage of tankers these recent years. This has resulted, as it were, in unemployment and bankruptcy.

6.4.6 RECEPTION FACILITIES

Reception facilities, in general terms, are provisions in ports and oil terminals for the reception of oily wastes, dirty ballast water, noxious liquid substances in bulk, sewage and garbage from ships.

Four out of five MARPOL 73/78 Annexes (I, II, IV and V) require that provisions be made in ports and terminals for the reception of the above-mentioned wastes.

Considering that Annex I is mandatory and that it entered into force on 2 October 1983, countries ratifying the MARPOL 73/78 Convention must be ready to give immediate effect to the provision of the reception facilities as required by the Annex. The same principle would apply to Annex II which is equally mandatory when it finally enters into force.

Regulation 12 of Annex I requires that reception facilities be provided in the following cases:
a) All ports and terminals in which crude oil is loaded into oil tankers where such tankers have immediately prior to arrival completed a ballast voyage of not more than 72 hours or not more than 1,200 nautical miles.

b) All ports and terminals in which oil other than crude oil in bulk is loaded at an average quantity of more than 1,000 metric tons per day.

c) All ports having ship repair yards or tank cleaning facilities.

d) All ports and terminals which handle ships provided with the sludge tank(s).

e) All ports in respect of oily bilge waters and residues which cannot be discharged in accordance with the prescribed discharge criteria, etc.

All the cases cited above are definitely not applicable to the Republic of Cameroon but there is no doubt that Cameroon needs reception facilities, particularly at Kole where crude oil is loaded into tankers and at the Douala/Bonaberi port which besides serving as an oil terminal and repair port berths various types of vessels as earlier indicated in Chapter III.

By and large, the Marine Environment Protection Committee's questionnaire on the adequacy of reception facilities in ports and oil terminals for the reception of oil residues from ships (MEPC 19/5/2) indicates that Cameroon is deficient in reception facilities at her offshore terminal at Kole.

The long list of countries also lacking such facilities accompanying the above questionnaire makes it crystal clear that provision of reception facilities is a major problem facing most nations today.
The most likely question to be asked would probably be whose responsibility it is to provide the reception facilities referred to earlier. Is it the Government's or the shipping industry's responsibility?

There is, in the opinion of the writer, no general and straightforward answer to the question. The Convention simply states that the Government of each party to the Convention shall undertake to ensure the provision of reception facilities according to the needs of the ships using its ports, terminals or repair ports. It does not say that it is Government's responsibility to provide such facilities. It does not say either that it is not Government's responsibility to provide the reception facilities. Who should be responsible for what is a matter to be settled between each Government and the shipping industry.

For the Republic of Cameroon it might be suggested that the responsibility to provide the reception facilities be left in the hands of the shipping industry i.e. the oil industry to be more specific, while the Maritime Administration, as it were, undertakes the task of ensuring the adequacy and proper functioning of such facilities.

However, before concrete measures are taken to provide reception facilities, it would be advisable to consider the following:

i) Size of the facilities needed in relation to the number of vessels that call at the particular port or terminal as well as the future changes that may lead to a greater or lesser demand for such a utility. Future changes would most probably come through employment of more advanced technology in ship construction and equipment leading to greater perfection in systems such as the Retention on Board and the Crude Oil Washing which can be used
more or less as alternative measures to reception facilities. This will obviously lead to a remarkable drop in the use of large-size reception facilities and a complete close-down of others.

ii) Location of the reception facilities in relation to the general cargo ports, oil terminals and repair ports. In Cameroon it would be advisable for the time being to install such facilities at Kole and at the Douala/Bonaberi port since the refinery, at Cap Limbo, is already provided with such a plant.

iii) Provision of plants or facilities for the reception of sewage and garbage from ships. It would be most appropriate that in Cameroon, such plants are provided for the port of Douala/Bonaberi and the Kole offshore terminal, for the time being.

6.4.7 **ROLE OF THE SHIPPING INDUSTRY**

In addition to installation of reception facilities, as pre-suggested, the shipping industry in Cameroon would be required to ensure:

a) that their equipment comply with the MARPOL 73/78 requirements and guidelines and specifications developed by IMO;

b) that they arrange for the construction or conversion of ships and installation of equipment to comply with MARPOL 73/78 requirements;

c) that they develop procedures for the operation of ships to meet the requirements of MARPOL 73/78;

d) that personnel on board are trained to ensure the safe operation of the new equipment.
The task of implementing the MARPOL Convention appears to be complicated, tedious and costly, giving the impression that more would be lost than gained from ratifying the MARPOL 73/78 Convention. The truth is far from it.

6.5 SOMEADVANTAGESFROMTHEMARPOL_73/78CONVENTION

The advantages likely to accrue to the Republic of Cameroon following the implementation of MARPOL 73/78 Convention include amongst other things, the following:

6.5.1 PROTECTIONOFTHEMARINEENVIRONMENT

Protecting the marine environment would amount to protecting the national economy as earlier vindicated in Chapter III. The MARPOL 73/78 Convention tries to achieve marine environment protection through:

a) Prevention of casualties that may lead to major spills;

b) Renewal and reinforcement of efforts aimed at eliminating minor spills that may occur as a result of operational, accidental or deliberate discharges of oily wastes into the sea. The latter cases are consequences of one or all of the following: malfunctioning of the machinery systems and equipment, lack of reception facilities at oil terminals and port areas or human deficiency stemming in most cases from inadequate training.

It goes without saying that the marine living resources and amenities, already examined in Chapter III, would be in jeopardy if proper measures are not taken immediately through implementation of the MARPOL 73/78 Convention.
6.5.2 AVOID MARINE ACCIDENTS

The risk of having a major spill through tanker accidents has been stressed. Such a risk cannot be over-emphasized for the Republic of Cameroon, whose geographical location and many other factors, mentioned earlier, speak for themselves.

The shipping industry in particular must understand that to prevent is better and cheaper than to cure. The AMOCO CADIZ disaster happened as a result of the failure of the steering gear. It cost the shipping industry huge amounts of United States dollars to repair damages and costs incurred.

The neglect of such requirements as the Segregated Ballast Tanks (SBT) and the Protective Location (PL) of such tanks might mean, in the event of an accident, not only suffering losses from the spill but also the loss of human lives, property and the ship. Such an accident might be several times more costly than it would otherwise have cost to prevent.

6.5.3 GIVE FREEDOM TO THE NATIONAL FLEET

When a Convention enters into force it becomes binding to all countries party to it. Ships flying flags of non-parties to the Convention, generally not complying with the provisions of the Convention, are not allowed to call in the ports of countries who are party to the Convention, for safety reasons. However, ships flying flags of countries party to the Convention in question must equally comply with the provisions of the Convention.

It implies that once Cameroon ratifies the MARPOL Convention her ships, complying with the MARPOL requirements and holding the necessary certificates, will be at liberty to call in foreign ports and ships flying flags of countries party to the Convention will readily call in the Cameroonian ports.
The effect of not having ships flying flags of non-parties call in Cameroonian ports will not be felt.

It is evident that Cameroon cannot and does not need to ratify all IMO Conventions relating to safety and pollution prevention. Notwithstanding the difficulties, she must ratify and implement the most important Conventions in the areas of the safety of life and property at sea, the protection of the marine environment and maritime transport. The advantages from such a move are twofold: safe navigation, clean and healthy marine environment, freedom to call in foreign ports, and what have you.

By and large, setting up a good maritime administration and ratification and implementation of pollution and safety Conventions are major steps towards preventing marine pollution from occurring. However, it is practically impossible to completely stop accidents from happening. This underscores the need to develop combative measures aimed at mitigating the effects of spills when prevention fails. The last part of this Chapter has been dedicated to such contingency measures.
7.1 PART III

7.1.1 CONTINGENCY PLANNING

This Part of the project has been devoted to the preparation of a national anti-pollution plan, as one of the possible solutions to marine pollution, for the Republic of Cameroon.

The contingency arrangements hereunder examined are not intended to replace the existing draft adopted by the inter-ministerial working group that met on 20 April 1983 at Douala, a meeting in which the writer, at the time Deputy Head of the Safety Service at the Merchant Shipping Department, participated representing his service. It is, in the main, an academic exercise wheeled and drilled on the academic platform but intended, principally, to assist in the building of a national contingency plan capable of responding adequately and efficiently to both minor and major pollution incidents in the marine environment.

By and large, the foundation stone of such a plan has already been laid in the above-mentioned draft, copy of which is attached at the annex.

Besides highlighting major items to be considered in establishing a contingency plan, the present plan has reviewed amongst others the concept of structure in a contingency arrangement, spheres of responsibility and proposed that the Ocean Division like Wouri and Fako Divisions, have a separate contingency plan. These very important points happened to have been overlooked or treated lightly in the adopted draft referred to above.

The present plan has benefited from many sources, the main ones being:
i) Expertise knowledge from the student's professors at the World Maritime University.

ii) Other nations' contingency plans - Swedish, Norwegian, Canadian, British, Dutch and American.

iii) Invaluable assistance from other experts in the subject.

iv) Expert knowledge from the Canadian and Swedish Coast Guard authorities.

7.1.2 DEFINITION

A Contingency Plan is an anti-pollution arrangement aimed at tackling speedily and effectively spills from oils or from noxious substances in the marine environment through a well-organized system whereby resources can be marshalled in a quick response by way of an efficient and coordinated command structure.

7.1.3 OBJECTIVE

The prime objective of such a plan is to provide a prompt and adequate response in the event of a pollution incident so as to minimize or possibly eliminate pollution damage that may be done to the living resources in the marine environment or counteract other hazards to human life and property originating from the pollution incident.

7.1.4 JUSTIFICATION

As pre-indicated in Chapter III, a number of reasons make marine pollution contingency plans absolutely necessary for Cameroon. The most important ones are the following:

i) Cameroon produces, refines and transports oil and oil products.

ii) Rapid growth of shipping activities with the Douala Port serving at the same time as a gateway for the landlocked countries of Tchad and the Republic of Central Africa.
iii) Geographical location: United Nations studies show that the Gulf of Guinea has the highest risk of accidental marine pollution in the region and that Cameroon, as a result of her location, runs the greatest risk from pollution among all other countries in the Gulf of Guinea.

The success of pollution combating lies in speed of attack and efficiency of action. This is attainable through a carefully structured and well organized contingency arrangement.

For lucidity purposes, the plan has been divided into two main stages, the first captioned preparatory and the second, action. There is in effect no major sequential differences between the two stages which are more or less anticipatory.

7.2 PLAN

7.2.1 STAGE I: PREPARATORY

7.2.2 PHYSICAL FEATURES OF THE COASTLINE

Knowledge about the nature of the coastline at various points is very important and must be handy. The coastline should be mapped in such a way as to indicate with clarity all the physical features and utilities. This should include among others cliffs, rocks, swamps, mangroves, harbours, estuaries, beaches, yacht clubs and marinas.

7.2.3 LOCAL OCEANOGRAPHIC FACTORS

The study of oceanographic factors prevailing in the entire territorial waters is crucial to a national contingency plan. Such studies should lead to the following findings:
i) Identification of currents, their speeds and direction at different times of the year.

ii) Wave heights (normal and maximum) at different areas of the territorial waters, the year round.

iii) Drawing up of tidal tables.

iv) Hydrographic knowledge - water depth, sandbanks, nature of seabed, etc.

7.2.4 **METEOROLOGICAL CONDITIONS**

Facts about the meteorological conditions of the area are of utmost importance to the setting up of a national contingency plan. They include amongst others the following:

i) Prevailing winds throughout the year including frequency, speed and direction.

ii) Periods and location of fog and mist.

iii) Tables on the atmospheric and sea temperatures at different times of the year.

7.2.5 **IDENTIFICATION OF PRIORITY ZONES**

After having had a thorough knowledge of the nature and forces acting along the coastline and on the entire marine environment, it becomes necessary to identify the zones which should be given priority in the event of a spill. Because of several constraints (financial, manpower, equipment, etc.) the national contingency arrangements may not be able to protect the entire coastline from spills. Drawing a priority list which includes such areas as nursery grounds, fisheries, estuaries, port areas, beaches, touristic sites, yacht clubs, fishing villages, etc. is very important.
7.2.6 **IDENTIFICATION OF HIGHLY SENSITIVE AND VULNERABLE AREAS**

These are areas where pollutants are most likely to cause heavy damages, particularly to the living resources such as nurseries, fisheries and mangroves.

7.2.7 **IDENTIFICATION OF PRIORITIES**

This is particularly important when it comes to deciding whether to save fisheries or beaches and birds following a pollution incident. The question normally arises when dispersants which can save birds and beaches to the detriment of nurseries and fisheries appears to be the only practical clean-up method for a given oil spill.

7.2.8 **MONETARY EVALUATION OF THE MARINE ENVIRONMENT**

It is essential to have at least a rough monetary evaluation of the living resources in the marine environment. Items such as fisheries, tourism and other resources and amenities from which the nation earns money should serve as a basis for the evaluation. Such an evaluation is of absolute importance when it comes to compensation following a pollution casualty.

7.2.9 **POLLUTION SOURCES AND ASSESSMENT OF SPILL SIZE TO BE EXPECTED**

Such knowledge will give an indication as to the quantity and quality of equipment and materials as well as human resources required.
7.3 STAGE II: ACTION PLAN

7.3.1 PLAN STRUCTURE

The action plan structure should embody three elements, namely, the Administrative or Divisional Structure, the Organizational or Command Structure and the Organization Chart. The three elements should be harmonized in such a way as to ensure total coverage of the entire territorial waters as well as a quick and efficient flow of action through the network in the event of a pollution incident.

7.3.2 ADMINISTRATIVE OR DIVISIONAL STRUCTURE

The Republic of Cameroon has in essence four main administrative divisions strategically located along her coastline. These are the Ocean Division, the Moungo Division, the Fako Division and the Ndian Division. The first three, by virtue of their location, have been made to harbour the country's major ports, thus transforming them into shipping centres.

Wouri Division with its capital and seaport at Douala ranks first in population density, shipping activities and pollution risk. The port of Douala shoulders over 80 per cent of the 90 per cent of Cameroon's foreign trade carried by sea. Besides, Douala port also serves as a gateway for the landlocked countries of Tchad and the Central African Republic. The intensive shipping activities of the port and the Wouri maritime zone justify the need for a contingency plan for the District.

Fako Division, with its headquarters at Limbe and ports at Limbe and Tiko, deserves to be considered in the second place. The fact that the national refinery (SONARA) at Cap Limbo is just 10 km from Limbe town, coupled with the Mile 6 Beach, just a few kilometres
from Limbe Town, and numerous fishing villages lining the coastal region of the S.W province as well as the presence of the offshore oil production fields some 35 km from the shore, justifies the need for a separate contingency plan to cover the coastal region of the South West Province.

The third is the Ocean Division, with its main seaport at Kribi. Kribi is situated a long distance from Douala and Limbe (see map, annex ) and known for its turbulent waters which on 22 June 1979 caused the grounding of a French oil tanker, PETRO-BOUSCAT, some 3 km south of the mouth of River Sananga. The greater part of the 800 tons of fuel the tanker was laden with are still onboard, recovery proving difficult, if not impossible. The region is blessed with beautiful beaches which attract tourists the world over and has rich fisheries on which depend the local and semi-industrial fishermen. Equally important are the prospects for offshore production of oil and natural gas in the area. These facts and many more are glaringly indicative of the fact that the Ocean Division requires, too, a separate contingency plan for a better protection of her maritime zone which is far removed and highly exposed to pollution hazards.

The fourth and most important is the national contingency plan which should cover the entire national marine environment stretching from the estuaries through the coastal waters to the high seas. The national contingency plan is normally applicable in the following cases:

a) The divisional contingency arrangements are inadequate.

b) The source of the pollution is unknown.

c) The incident is on the high seas.

d) The incident is international.
7.3.3 CONTINGENCY ARRANGEMENTS FOR THE REFINERY AND OIL COMPANIES

Given that offshore production sites and the national refinery are by virtue of their operation, areas with the highest pollution risk within the national marine environment, it is advisable and necessarily so that the national refinery, SONARA, and the oil companies establish separate contingency plans. Such plans will have to be approved of by the Administration and should together with the divisional plans form an integral part of the national contingency plan as shown in the organization chart hereafter. Already SONARA and the oil companies have more or less established individual contingency plans and are in the process of establishing a joint anti-pollution arrangement for the oil industry. This is a positive move that deserves encouragement and possibly support from the Administration.

7.3.4 ORGANIZATIONAL OR COMMAND STRUCTURE

It is a functionally stratified structure aimed at organizing the human resources in such a manner as to make it fit as much as possible into the divisional structure. Whereas the divisional structure has to do with environmental partitioning into zones, the command structure deals with the selection of qualified personnel to head, direct or participate in the anti-pollution operations at various levels in the outlined divisions.

On the command structure from top to bottom in the descending order are the Government, the National Standing Committee on Emergencies at Sea (NSCES), the National Command Team (NCT), the Standing Committees for Emergencies at Sea for the Administrative Divisions (Douala, Limbe, Kribi), the National Refinery and the oil companies, the Administrative Divisions Command Teams, and at the bottom, the On-Scene Commanders for the command teams.
7.3.5 ORGANIZATION CHART

The Organization Chart is the administrative structure drawn in the form of a chart for easy apprehension. See the chart below.
FIG. IV: ORGANIZATION CHART: COMMAND STRUCTURE
(REPUBLIC OF CAMEROON)

GOVERNMENT

N.S.C.E.S.

O.S.C.  N.C.T.  O.S.C.
(Onshore/Inshore)  (Sea)

OIL INDUSTRY  D.S.C.E.S.  L.S.C.E.S.  K.S.C.E.S.


NSCES : National Standing Committee on Emergencies at Sea
NCT  : National Command Team
OSC  : On-Scene Commander
D   : Douala
L   : Limbe
K   : Kribi
7.3.6 DEFINITIONS

The definitions hereunder are intended to clarify terms or appelations as used in this draft. For the sake of convenience, some of the appelations are the same as found in the inter-ministerial draft contingency plan earlier referred to.

i) National Standing Committee for Emergencies at Sea (NSCES)

The NSCES is the coordinating authority within the national Government designated as having an overall responsibility for preparing for and the conduct of maritime environmental emergency responses and related matters. The divisional contingency plans shall each have a Standing Committee for Emergencies at Sea. The latter shall perform similar functions as the NSCES but to a reduced scale. The NSCES shall act as an advisory body.

ii) National Command Team (NCT) and others

The NCT is a team of experts and trained personnel that actually handles the operations. The team shall be constituted by the NSCES from a standby call list composed as indicated below: its composition being determined, as it were, by the nature and location of the spill. At the divisional levels, the command team shall be constituted by the divisional SCES from a standby call list. The local command teams shall play similar roles as the NCT, at their levels as would be shown below.

iii) On-Scene Commander (OSC)

The OSC is the individual commander on-scene designated by the SCES to lead and direct the operations. The size and location of spills shall act amongst other things as determining factors in the selection of On-Scene Commanders. For higher efficiency, though
less economical, some experts in the field hold that it is necessary to appoint for each command team two on-scene commanders, one for the operations at sea and the other for the onshore/inshore operations. For Cameroon, it would be advisable to combine the two operations under one on-scene commander in each case, for the time being.

iv) National Command Call List (NCL)

The National Command Call List shall consist on the one hand of a list of important personalities, trained and/or skilled personnel and organizations with addresses, telephone and telex numbers, likely to be called upon in the event of an emergency at sea. On the other hand, the list shall consist of an inventory of all available equipment and materials ready for use in an emergency. The persons, materials and equipment may be normally engaged in regular duties from which they may be called and temporarily detached in the case of an emergency. The Command Teams at the divisional levels shall be required to establish each one a call list. The call lists shall be regularly reviewed and updated.

7.3.7 FUNCTIONS AND COMPOSITION OF THE CONTINGENCY PLANS

National Contingency Plan (NCP)

The national marine pollution contingency plan is an emergency plan for combating major accidental spills of oil or other noxious substances within the national marine environment. The NCP shall be subdivided into two main functional parts, namely, the NSCES and the NCT, the former acting as lead agent.

7.3.8 FUNCTIONS

The functions of the NSCES shall consist in the following:
i) Scientific studies of the marine environment and the resources therein.

ii) Studies on the physical features of the entire marine environment and the natural forces acting upon it.

iii) Assessment of the nature and size of the threat to which the country is likely to be subjected.

iv) Acquisition of resources.

v) Training of personnel.

vi) Control and coordinate operations at the divisional levels.

vii) Response to emergencies at the international level.

viii) Information and guidance of the affected populations.

ix) Control of all financial deals relating to marine pollution.

x) Monetary evaluation of the national marine environment.

7.4 COMPOSITION

The NSCES shall essentially be composed of competent representatives of:

i) Ministry of Armed Forces (Naval and Air Forces).

ii) Ministry of Transport (Merchant Marine, Ports Authority, National Meteorology).

iii) Ministry of Equipment.

iv) Ministry of Mines and Energy (Refinery and Oil Companies).


vii) Representatives of the SCES from Douala, Limbe and Kribi.

viii) Ministry of Posts and Telecommunications.
7.4.1 NATIONAL COMMAND TEAM

7.4.2 FUNCTIONS

i) Planning and directing the operations.

ii) Selection of equipment and personnel for the operations.

iii) Actual clean-up of spills and salvage operations.

iv) Provision of operations support.

v) Administration of the operations.

vi) Regular drills and exercises.

7.4.3 COMPOSITION

i) Trained technicians for the operation of sea, land and air transport systems.

ii) Trained personnel for communication and operation of communication equipment.

iii) Trained technicians for the clean-up and operation of clean-up equipment.

iv) Logistical support for surveillance and monitoring from ships, aircraft and land.

v) Vessel traffic control specialists to regulate access to operation area.

vi) Fire brigades and salvors.

vii) Marine scientists.

7.4.4 NATIONAL COMMAND TEAM CALL_LIST (NCL)

COMPOSITION:

The following services shall provide information and any other form of assistance leading to the establishment and regular updating of the national command call list:
i) Ministry of Armed Forces (Naval and Air Forces).

ii) Ministry of Transport (Merchant Marine, Ports Authority, National Meteorology).

iii) Ministry of Territorial Administration - Governor's Office of the three Littoral Provinces (Littoral Province, South West Province and Central South Province).

iv) Ministry of Information and Culture.

v) National Security Gendarmerie.

vi) National Refinery (SONARA) and oil companies.

vii) Ministry of Higher Education and Scientific Research (Faculty of Sciences, University of Yaounde, M.A.B).

viii) Ministry of Animal Breeding and Fisheries.


x) Ministry of Post and Telecommunications.

7.4.5 **DOUALA MARINE POLLUTION CONTINGENCY PLAN (DCP)**

The DCP is an emergency plan for combating minor and major spills of oil or other noxious substances within the Douala maritime zone. It is an integral part of the National Contingency Plan. The DCP is composed of two main functional divisions - the DSCES and DCT.

7.4.6 **FUNCTIONS_OF_THE_DOUALA_STANDING_COMMITTEE_ON EMERGENCIES_AT_SEA**

The duties of the DSCES shall include amongst others the following:

i) Participation with the National SCES in carrying out scientific studies in the Douala Maritime Zone.
ii) Identification of pollution sources and estimation of the size of threat to which the Douala maritime zone is exposed.

iii) Monetary evaluation of the Douala marine environment.

iv) Acquisition of resources.

v) Active participation in the training of personnel.

vi) Information and guidance of the affected populations.

vii) Response to pollution emergencies within the Douala maritime zone.

viii) Regular reports on activities to the National SCES.

ix) Participation in the National SCES meetings.

7.4.7 COMPOSITION OF THE DOUALA SCES

i) Commander of the Naval Forces.

ii) Commander of Douala Port.

iii) Director of Merchant Marine.

iv) Director of National Meteorology.

v) Director of Oil companies.

vi) Governor of Littoral Province (Douala Municipality).

vii) Ministry of Animal Breeding and Fisheries Industries.

viii) Ministry of Higher Education and Scientific Research.

7.4.8 THE DOUALA COMMAND TEAM (DCT)

FUNCTIONS

i) Planning and directing the operations within the Douala maritime zone.

ii) Selection of personnel, equipment and materials for operations.
iii) Administration of the operations.
iv) Regular drills and exercises.
v) Actual clean-up of spills and salvage operations.
vi) Control of vessel traffic during operations.

vii) Regular monitoring and reporting of movement and behaviour of spills.

viii) Storage, repairs and maintenance of equipment and materials.

ix) Detailed report of operations to the Douala SCES.

7.4.9 **THE DOUALA EMERGENCY CALL LIST (DCL)**

The services hereunder enlisted shall provide necessary information and any other form of assistance leading to the establishment and regular updating of the DCL:

i) Ministry of Armed Forces (Naval Forces).

ii) Governor of Littoral Province (Douala Municipality).

iii) Ministry of Transport (Merchant Marine, National Meteorology).

iv) National Ports Authority.

v) Ministry of Information and Culture.

vi) Ministry of Higher Education and Scientific Research (University of Yaounde - Faculty of Science; M.A.B.).

vii) Ministry of Animal Breeding and Fisheries.

viii) Recognized marine scientists.

ix) Ministry of Post and Telecommunications.

7.5 **THE LIMBE MARINE POLLUTION CONTINGENCY PLAN (LCP)**

The LCP is a response plan for dealing with emergencies at sea within the Limbe maritime zone, emergencies resulting from both minor and major discharges into the sea of oil and other toxic substances.
The plan consists of two main functional divisions, namely, the Limbe Standing Committee on Emergencies at Sea (LSCES) and the Limbe Command Team (LCT).

7.5.1 **FUNCTIONS_OF_THE_LSCES**

i) Participation in carrying out scientific studies in the Limbe maritime zone, with the National SCES.

ii) Monetary evaluation of the Limbe marine environment.

iii) Identification of marine pollution sources and estimation of size of the threat to which the region is likely to be subjected.

iv) Regular reports to the National SCES on the activities of the Committee.

v) Acquisition of resources.

vi) Participation in the training of personnel.

vii) Information and guidance of affected populations.

viii) Response to emergencies within the Limbe maritime zone.

ix) Regular meetings with the National SCES.

7.5.2 **COMPOSITION_OF_THE_LIMBE_SCES**

i) Ministry of Armed Forces (Naval and Air Forces).


iii) Ministry of Mines and Energy (oil companies).

iv) SONARA oil refinery.

v) Governor of the South West Province.

vi) Ministry of Animal Breeding and Fisheries.


viii) Recognized marine scientists, etc.
7.5.3 THE LIMBE COMMAND TEAM (LCT)

7.5.4 FUNCTIONS:

i) Planning and directing the operations within the Limbe maritime zone.

ii) Selection of personnel, equipment and materials for operations.

iii) Administration of the operations.

iv) Actual clean-up of spills and salvage operations.

v) Regular drills and exercises.

vi) Control of vessel traffic during operations.

vii) Regular monitoring and reporting of movement and behaviour of spillage.

viii) Detailed report of operations to the Limbe SCES.

ix) Storage, repair and maintenance of equipment and materials.

7.5.5 COMPOSITION

i) Trained technicians to operate vehicles and other transport equipment.

ii) Vessel traffic control specialists to control access to operation areas.

iii) Trained staff for clean-up and operation of the clean-up equipment.

iv) Logistic support for surveillance and monitoring from ships, aircraft and land.

v) Fire brigade(s) and salvors.

vi) Marine scientists capable of determining the chemical properties of pollutants and their possible effects on human and marine lives.
vii) Trained personnel for communication and operation of communications equipment.

viii) Others - photographers, divers, general labour force, etc.

7.5.6 **THE LIMBE EMERGENCY CALL LIST (LCL)**

The following services shall provide necessary information and any other form of assistance leading to the establishment and regular updating of the LCL:

i) Ministry of Armed Forces (Naval Forces).


iii) Merchant Marine Limbe.

iv) National Ports Authority Limbe.

v) National Meteorology.

vi) Governor's Office - South West Province.

vii) National Security and Gendarmerie, Limbe.

viii) Ministry of Information and Culture.

ix) Ministry of Higher Education and Scientific Research (University of Yaounde - Faculty of Sciences; M.A.B.).

x) Ministry of Animal Breeding and Fisheries Industry.

xi) Ministry of Post and Telecommunications.

7.5.7 **THE KRIBI MARINE POLLUTION CONTINGENCY PLAN (KCP)**

The KCP is an action plan for combating both minor and major spills of oil and other noxious chemical substances within the Kribi Maritime Zone. The plan is composed of two main functional divisions - the Kribi SCES and the Kribi Command Team.
7.5.8 FUNCTIONS OF THE KRIBI SCES

i) Participate in carrying out scientific studies within the Kribi maritime zone.

ii) Identify pollution sources and estimate degree of pollution threat to which the maritime zone is likely to be subjected.

iii) Make regular reports to the National SCES on her activities.

iv) Acquire resources for pollution combat.

v) Evaluate in monetary terms, Kribi marine environment.

vi) Participate in the training of personnel.

vii) Responsible for information and guidance of affected population.

viii) Response to pollution emergencies within the Kribi maritime zone.

ix) Participate in National SCES meetings.

7.5.9 COMPOSITION OF THE KRIBI SCES

i) Ministry of Armed Forces (Naval Forces).

ii) Ministry of Transport (Merchant Marine, Ports Authority, National Meteorology).

iii) Ministry of Mines and Energy.

iv) Ministry of Animal Breeding and Fisheries Industries.

v) Marine scientists.

vi) Kribi Municipality.

7.6 THE KRIBI COMMAND TEAM (KCT)

7.6.1 FUNCTIONS

i) Planning, directing and coordinating operations within the Kribi maritime zones.
ii) Selection of personnel, equipment and materials for operations.

iii) Administration of operations in the Kribi maritime zone.

iv) Actual clean-up of spills and salvage operations.

v) Control of vessel traffic during operations.

vi) Regular monitoring of spill movement and behaviour.

vii) Storage, repairs and maintenance of materials and equipment.

viii) Regular drills and exercises.

ix) Detailed reports on field operations to Kribi SCES.

7.6.2 COMPOSITION

i) Capable technicians to operate and maintain vehicles and other transport systems.

ii) Trained personnel for clean-up operations and the operation of clean-up equipment.

iii) Logistic support for surveillance and monitoring from ships, aircraft and land.

iv) Vessel traffic specialists to control access to operation areas.

v) Marine scientists to determine type of pollutant and possible effects on human and marine lives.

vi) Fire brigade(s) and salvors.

vii) Trained staff for communication and the operation of communication equipment.

viii) Others - divers, press officer, fishermen, photographers, etc.
7.6.3 **THE_KRIBI_EMERGENCY_CALL_LIST** (KCL)

7.6.4 **COMPOSITION**

The services here below designated shall provide information and any other form of assistance that shall lead to the establishment and regular updating of the KCL:

i) Ministry of Armed Forces (Naval and Air Forces).

ii) Ministry of Transport (Merchant Marine, National Ports Authority, National Meteorology).

iii) National Security and Gendarmerie - Kribi.


v) Ministry of Information and Culture.

vi) Ministry of Higher Education and Scientific Research (University of Yaounde - Faculty of Sciences; M.A.B.).

vii) Ministry of Animal Breeding and Fisheries Industries.

viii) Kribi Municipality, etc.

The Kribi separate Contingency Plan was not considered necessary in the already adopted draft referred to above. It is as a result of several reasons earlier outlined in this part that the writer considers the separate consideration of the Kribi maritime zone, an absolute necessity.

It is hoped, however, that the inter-ministerial group earlier mentioned will find the need to adopt the now proposed Kribi Contingency Plan which, as it were, remains subject to modifications, corrections or even suspension.
Further to the discussion on the Administrative or Divisional Structure vis-à-vis the Organizational or Command Structure, in connection with establishing a National Contingency Plan for the Republic of Cameroon, it is essential to identify resources as well as choose the processes best suited to establishing such a plan.

RESOURCES

Resources is used here in a very broad sense and includes amongst other things personnel, finances, equipment and materials of all sorts, required for an effective pollution combat. For the present plan the following resources have been deemed necessary.

i) EQUIPMENT AND MATERIALS

The choice of equipment and materials shall very much depend on the clean-up methods adopted and the systems of transportation and communication to be employed.

For a better understanding of the problem here, knowledge of clean-up methods, however cursory, is deemed necessary.

There are basically three clean-up methods:

1) "Mechanical" by use of booms and skimmers for containment and removal of spills.

2) "Chemical" by use of dispersants, steam or fire to disperse or burn the spillage.

3) "Manual" by use of hoses, buckets, spades, sorbents, etc. for removal of spills.
Notwithstanding, the methods, equipment and materials to be used are further determined by the following factors: nature of the pollutant, the locality, the physical nature of the shore, its amenity value, the importance of the marine and shore life, access to the shore, weather conditions, etc.

Given, however, that the chances of using one or all of the above clean-up methods are extremely high in Cameroon, it is advisable to be equipped with all the three clean-up methods. In this connection it shall be absolutely important for the National SCES to decide on types and qualities of equipment and materials required and which of these should be purchased, hired or borrowed, when and from whom and in what quantities.

Considering the fact that it is rather too costly to purchase, store and maintain such equipment and materials which are likely to remain unemployed for long periods, it would be advisable to purchase limited quantities, say 50 per cent of the whole, rather than stock-pile huge quantities. This being the case the SCES shall make firm arrangements with fishing companies, oil companies, the refinery, the Cameroon National Ports Authority, Government Departments and Services, other Organizations, individuals, etc., owners of equipment and materials (fishing trawlers, tugs, aircraft, vehicles, booms and skimmers, spades, hoes, buckets, sorbents, etc.) for back-up supply of same if need should arise.

In order to facilitate storage and proximity to the different zones, the purchased stocks shall be distributed to the divisional SCES proportionately, taking into consideration the degree of threat and the size of pollution each zone is exposed to, as well as the possibilities of an immediate external assistance in case of an emergency.
The National SCES shall make an inventory of all the readily available equipment and materials owned, to be borrowed or hired.

However, details relating to storage, maintenance, repairs and replenishment during and after an incident should normally be discussed at the divisional levels by the Standing Committees on the Emergencies at Sea.

ii) COMMUNICATION

Communication which consists in the rapid exchange of information, is key to success in any anti-pollution operation. Vitally important is the need to have an efficient network of communication systems linking all the transportation systems (air, sea, land). This is attainable through the following:

a) Selection of the most efficient and user-friendly communications systems such as land telephone, telex, radio (VHF, UHF), portable VHF radios, Walkie Talkies, etc.

b) Selection of a distress channel.

c) Efficient information exchange: ship to ship, ship to shore, ship to aircraft and vice versa, should be made possible through the use of the present satellite communication systems introduced by the International Maritime Satellite Organization (INMARSAT). Formerly and prior to the introduction of the satellite communication systems, exchange of messages as pre-indicated was very difficult, if not impossible. In order to benefit from the satellite communication systems, the Republic of Cameroon will need to become a Party to INMARSAT. Many countries have become signatories through their Post and Telecommunications Ministries.
iii) **PERSONNEL**

The success of any contingency arrangement lies on the availability of a well-trained personnel capable of handling the various pollution incidents that may arise.

Four categories of personnel may be required:

a) Personnel with command experience and knowledge, well suited to organizing and directing operations at sea and on shore/inshore.

b) Personnel with marine science background able to carry out scientific studies on the marine environment and capable of identifying pollutants, their effect on human and marine lives and capable of determining proper clean-up methods.

c) Personnel with a sound legal background in maritime law.

d) Others, such as trained salvors, divers, crews, pilots, fire brigade, photographer, able technicians, press officers, general labour force, etc.

iv) **SALVAGE**

In order to minimize damage to the marine environment or save human life and property, in the event of marine casualty, salvage is of utmost importance. Need for salvage arrangements is underscored by the fact that most pollution cases caused by tanker accidents, more often than not, involve human life and property salvage. To carry out salvage operations, as well, the National Contingency Plan must be equipped with well-trained salvors and salvage equipment and materials.

Information should be handy on matters relating to human resources, equipment and materials necessary for salvage operations.
v) **FINANCE**

Purchasing, hiring, transportation, etc., of equipment and materials, of manpower and other services, demand money. As a matter of fact, it is impossible to establish a marine pollution contingency plan without a solid financial backing.

In most cases, there is a standing fund uniquely for anti-pollution operations. Amounts are drawn from this fund in times of emergency. The usual practice is to ensure that the amount withdrawn is refunded as soon as possible. This measure is important because pollution incidents are never announced.

Generally, it is the national Government that initially contributes to the fund. In the event of pollution incidents, money drawn from the fund is paid back by polluters as compensation for clean-up expenses and damages incurred. Sometimes the polluter is not known and sometimes compensation is much lesser than the total expenses, resulting in a considerable fall in the standing fund. In such cases, it is still up to the national Government to replenish the fund.

Given the importance of an anti-pollution arrangement for Cameroon, it would perhaps be advisable to give a lasting financial solution to this problem through creation of a budget line under the budget of the Ministry of Transport actually in charge of marine pollution.

7.6.7 **PROCESSES**

Having identified, more or less, resources needed for the setting up of a national contingency plan, it becomes equally important to highlight the processes that will lead to maximum and effective utilization of the resources. The most important processes are hereunder discussed:
i) **SPHERES OF RESPONSIBILITY**

For a National Contingency Plan to ensure a complete coverage of the entire marine environment from port areas through the coastal waters and out to the territorial sea and beyond, there is need to define clearly spheres of responsibility. This is to ensure a more effective action in times of pollution emergencies.

In doing this, those duties and responsibilities that traditionally fall within the framework of such corporations as the National Ports Authority, the National Refinery (SONARA), and the oil companies, must be maintained, encouraged and supported. Any attempt to alter this might jeopardize the chances of success for the National Contingency Plan.

For instance, it is but prudent to allow the National Port Authority to reinforce or set up her own contingency measures for port areas under her jurisdiction. Her contingency plans should take care of minor spills within port areas, which are rather frequent in the Douala/Bonaberi port area. In cases of major spills the National Ports Authority should call on the Divisional Contingency Plan for the maritime zone in question, for assistance. If there is still no success, the National Contingency Plan could then be called upon for more assistance.

The levels of responsibility should normally take the following pattern:

a) Port Areas - National Ports Authority's contingency arrangements.

b) Oil terminals:
   - SONARA - Cap Limbo Terminal) Oil industry's
   - Offshore Production Terminal) Contingency Arrangements
   - Port Terminals - National Ports Authority's Contingency Arrangements

c) Divisional levels - Divisional Contingency Plans
d) National Territorial Waters - National Contingency Plan and Bilateral or Regional Contingency Plans, or both.

e) Unknown pollution sources - National Contingency Plan

f) Beyond Territorial Waters - National Contingency Plan and Bilateral or Multilateral Contingency Plans, or both.

ii) **TRAINING**

Considering the fact that training of personnel is key to success in setting up a National Contingency Plan, the National Standing Committee for Emergencies at Sea should work out as soon as possible a personnel training scheme covering the different aspects of knowledge and skills required for such a plan. Such a training scheme should be subjected to regular updating so as to keep pace with the changing technology.

The trainees should normally be regularly employed in other industries from where they can be called in the time of need. The training schemes should, therefore, be drawn in such a way as to facilitate job mobility.

iii) **DRILLS AND EXERCISES**

In order to keep memory refreshed, body active, equipment and materials up-to-date and ready for pollution emergencies, constant drills and exercises should be made a rule for both the National and Divisional Contingency arrangements.

Such practices should be carried out once a year, to say the least.

iv) **SURVEILLANCE AND MONITORING**

Land, ship and airborne surveillance should be organized. The Navy and the Air Forces, Merchant Marine,
Ports Authority, the Gendarmerie Brigade Maritime, Customs, fishermen, pilots and crews, etc., should be of great assistance to the National and Divisional Contingency Plans in this aspect.

In the same manner, their assistance is highly needed when it comes to monitoring the movement and behaviour of spills during and after clean-up. When dispersants are used, monitoring and assessment of short and long term effects on marine life are vital for future decisions.

v) **MASS MEDIA**

Marine pollution has been thought of as being one of the most sensitive and even sentimental issues to the public. As such, information to the public on pollution casualty should be selective and well channelled. For this to be effectively done, it is necessary to appoint competent press officers for the National and Divisional Contingency arrangements.

Press interviews should be carried out by such officers.

vi) **WASTES DISPOSAL**

During and after a clean-up operation, there is collection of hazardous materials usually mixed up with soil, sand or water. The material wastes collected following either an oil spill or a chemical substance spill have been considered very hazardous to both marine and land environment. Their hazardous nature poses the fundamental problem of disposal of such wastes.

In order to minimize or possibly ward off this problem, the National SCES should work out a means considered most safe for the disposal of all kinds of waste collected from a spill site. Such a prearranged disposal is vital since the removal of the spill collected from the site might begin immediately in order to create more space for further collections.
In working out such a scheme, specifications should be made as to the types of containers to be used, means of transportation and method of disposal for oily and chemical substance wastes.

One or more of the following disposal methods are currently used by most countries.

i) **Land transport**

   The waste material is spread over the surface of the ground and then mixed with the soil. This type of treatment provides for the chemical and biological breakdown of the material. The limiting factors involved here are the lack of land availability, the lengthy process and the relatively low quantity of material that may be spread over the land. Other factors that may prevent land treatment from application are amongst others the type of soil, the type of material wastes, and heavy rainfall.

ii) **Landfills**

   This entails selecting an area of land, carving out large openings to be filled with wastes. This method has been thought of as being most practical for the disposal of large quantities of hazardous wastes. However, it has been cautioned that such landfills must be adequately prepared, lined, secured and controlled in order to be safe to the surrounding environment.

iii) **Deep Well Injection**

   The wastes are injected through pipes into well-contained natural spaces below the surface of the earth, such as exhausted oil wells. Nonetheless, it has been cautioned that great care must be taken to ensure that leakage does not occur from the piping possibly resulting in the surfacing of contaminants miles away. This method has been less successful and thus unsafe.
iv) **Incineration**

This requires the use of high temperature, oxidation reaction between the material and air under controlled time, temperature, turbulence and oxygen concentration, within a dedicated combustion chamber of proper geometric configuration and size. Incineration of chemical materials must be carefully regulated because of the possibility of the spreading of contaminants and dangerous by-products through the air causing atmospheric pollution. Another danger emanating from chemical wastes incineration is that some solid by-products that also require disposal themselves may be produced.

v) **Reprocessing/recovery**

This method aims at recovering the spilled material collected. It entails separating the material from soil, sand or water mixtures. The method is most successful with oily wastes. It is highly recommended for countries that have efficient reprocessing plants.

For Cameroon, the National Refinery, SONARA, could be of good service in this aspect. Her existing plant may require major touches to meet the demands of the National Contingency Planning.

vi) **Liability and compensation**

In a major pollution casualty at least one of the following is to be expected:

a) Losses and expenditures resulting from clean-up and salvage operations.

b) Serious damage being done to marine life, beaches and other utilities.

c) Losses incurred as a direct consequence of the pollution incident, such as the sudden drop in revenues from fisheries and tourist sites.
d) Indirect losses resulting from pollution incident such as food shortages, unemployment, health problems, etc.

The losses and damages suffered particularly under a) and b) must be compensated for by the polluter, usually the shipowner. Losses under b) and c) are fairly difficult to assess and are generally considered far-fetched, especially the last point.

In order to lighten the compensation burden which is more often than not too heavy for the shipowner as well as provide additional compensation to the victims of pollution damage, compensation schemes have been set up by the International Maritime Organization (IMO) and the Oil Industries to which Government and/or tanker owners have got to become parties if they want to benefit from such schemes. The most important ones are here below enlisted:

a) IMO's compensation schemes:

- International Convention on Civil Liability for Oil Damage, 1969
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971

b) Oil industry's schemes:

- Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP)
- Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL)
- Offshore Pollution Liability Association Limited (OPOL)
- Protection and Indemnity Clubs (P & I Clubs)
INTERNATIONAL JOINT CONTINGENCY PLANS

Decision to establish bilateral, regional or sub-regional agreements on pollution matters is usually triggered off either by the communality of interest in the same area by the States involved or by the degree of exposure of the area to pollution hazards or both.

As earlier mentioned in Chapter III, U.N. studies on the Gulf of Guinea have indicated that the region has the highest risk of accidental marine pollution from oil spills, principally due to large offshore production, high shipping density and the presence of major ports and refineries.

Furthermore, the Gulf of Guinea is rich not only in non-living but in living resources as well. The region is particularly rich in fisheries.

It is thus to the interest of all the countries in the Gulf Region (Cameroon, Nigeria, Gabon, Equatorial Guinea, Sao Tome and Principe) to establish a regional agreement on pollution combating based on a joint contingency plan.

Such a joint contingency plan is justified, still, by the following reasons:

a) A major pollution incident may require more than the efforts of one country to effectively deal with it. For instance the AMOCO CADIZ disaster was even more than the joint efforts of the English and French.

b) Another reason is the fact that pollution knows no frontiers. A tanker disaster may happen in the waters of one of the countries in the Gulf of Guinea and ends up polluting the coastlines of others hundreds of miles away. This could be made possible by winds and currents.
Moreover, United Nations experts in marine pollution and related matters from IMO and UNDP have recommended, as one of the anti-pollution measures, formation of a regional contingency plan for the Gulf of Guinea. It is up to the countries concerned to work out such a plan.

However, technical assistance from the above-mentioned UN organizations shall be indispensable, particularly as the formation of the regional contingency plan for the Gulf of Guinea concerns five nations and consequently more complex issues.

For the Republic of Cameroon the importance of creating a regional and/or bilateral contingency arrangement cannot be over-emphasized given that she lies in the part of the Gulf region with the highest probability of accidental pollution.

7.8 SUMMARY

7.8.1 PREPARATION

i) Concise knowledge of the marine environment, physical features, oceanographic factors, meteorological conditions, etc.

ii) Identification of priorities and sensitive and vulnerable areas.

iii) Assessment of nature and size of threat.

iv) Monetary evaluation of the marine environment.

7.8.2 ACTION

i) Before pollution incident:
   a) Appoint competent authorities - organizers and technicians.
   b) Define clearly their roles.
c) Make their task easy by drawing up a clear and detailed organization chart, and make available to them all information and resources required for the operations.

ii) During pollution incident:
   a) Rapid exchange of information between competent officials on major decisions and relevant procedures.
   b) Put the contingency plan into action.
   c) Make an inquiry into the incident and write a comprehensive report.

iii) Post clean-up operations:
   Final analysis and conclusions
   a) Technical aspects - successes and failures.
   b) Legal considerations.
   c) Financial deals.

7.8.3 INTERNATIONAL_JOINT_CONTINGENCY_PLANS

Establishment of an international joint contingency plan on a bilateral or regional basis, or both.

7.9 RECOMMENDATIONS

The following recommendations have been thought of as being of crucial importance when considering the establishment of a National Contingency Plan in Cameroon.

7.9.1 SCIENTIFIC_FACTS_ABOUT_THE_MARINE_ENVIRONMENT

Fortunately enough, the Ministry of Higher Education and Scientific Research, through MAB, has come up with proposed programmes on environmental research and studies for 1983/84. These programmes are expected to cover, amongst many other items, marine and coastal ecosystems, aquatic pollution and environmental information, all of which are very essential for the fight against marine
pollution. Government's financial support is absolutely indispensable.

7.9.2 USE_OF_DISPERSANTS

Following marine scientific research and studies as earlier mentioned, the National Standing Committee on Emergencies at Sea should issue a statement on recommended clean-up methods for different areas of the national marine environment, taking into consideration the geographic, oceanographic, ecological and meteorological factors prevailing in the area. Such a statement is particularly important because dispersants which have been proven to be harmful to living resources are more often than not used indiscriminately. Choice of dispersants is equally important (conventional or concentrate dispersants).

7.9.3 COOPERATION_AND_COMPLETE_INTEGRATION

For a solid and effective National Contingency Plan to be established, there is need for the following:

a) Cooperation within the oil industry (refinery and oil companies).

b) Cooperation between local contingency plans (Douala, Limbe, Kribi).

c) Cooperation between local and oil industry contingency arrangements.

d) Cooperation between the oil industry and the Government.

e) Cooperation between the local, oil industry and National Contingency Plans.

f) Complete integration of all the contingency arrangements into the National Contingency Plan.
7.9.4 TRANSFER_OF_RESIDUAL_OIL_ETC.

The SCES should work out a system whereby transfer of residual oil, gas or chemical substances from a damaged ship could be carried out without delay. This is extremely important given that such an operation could be highly delicate and very costly if necessary transfer arrangements are not made in anticipation. This is necessarily so because such an operation would require the following:

a) Specialized knowledge and skilled labour.

b) Speedy action.

c) Financial backing.

Necessary preparations would while facilitating the above-mentioned, minimize pollution damage to the marine environment.

In the light of the above, the SCES should adopt one of the following:

a) Arrange with the National Ports Authority or any other company based in the country and capable of carrying out such operations to undertake such transfers when the need arises. A small tanker like TOTAL DIBAMBA could be equipped to render such services when necessary.

b) Consult the ITOPF, generally recognized as the leading centre of expertise in this particular field, for technical and/or financial assistance.

By and large, there must be a prearranged space for the temporal storage of such residues.

7.9.5 CONTINGENCY_ARRANGEMENTS_FOR_EMERGENCIES_OTHER_THAN_POLLUTION

The SCES could set up special committees to assist the DMS, the National Ports Authority, the Navy, the Customs, the Police, the Brigade Maritime, the Fire Brigade,
charged with the safety of the marine environment, in the preparation and execution of contingency arrangements for emergencies other than pollution within the marine environment.

Such emergencies include, amongst others, things like fire-fighting, search and rescue following groundings, collisions, drownings and fire/explosions; salvage; theft; piracy, etc.

7.9.6 "LEVEL OF AMBITION"

It is impracticable and financially unrealisable for any nation to be fully equipped for a pollution incident such as the one caused by the AMOCO CADIZ wherein 68 million gallons of crude oil were spilled, a spill which was far beyond the joint Anglo-French capability. However, countries should be able to take such measures as are necessary to combat minor spill and/or minimize to a large extent, damage from major spills before outside assistance is possibly sought.

As to the level of ambition for the Republic of Cameroon, account should be taken of the following:

i) Geographic location of the country.

ii) Shipping activities.

iii) Tanker traffic.

iv) Amount of oil actually being produced.

v) Amount of oil handled within the territorial waters.

vi) Prospects for future increase in the quantity produced and the quantity handled, and

vii) Chances for future spillages (See Chapter III for details).
All these considered, more or less, it would be advisable to set up national contingency arrangements capable of tackling both minor and major spills of at least 10,000 tonnes per incident.
GENERAL CONCLUSION

It has been established that Man's activities are gradually and surely transforming the marine environment into a dumping ground, if not a cesspool. Such activities which include, inter alia, maritime transportation, seabed mining, offshore production of petroleum and natural gas, have of late accelerated the degree of utilization of the marine environment aggravating, as it were, the discharge of pollutants into the oceans through ship operations and accidents.

Rapid population growth resulting in increasing demands for food, shelter, transportation and a higher standard of living; amongst other things, is believed to have necessitated technological and industrial advancements.

Unfortunately, industrialization is not without shortcomings. As the principal contributory factor to an improved standard of living today, it is a source of life, but as a source of pollution, it is a destroyer of that same life.

Considering, however, that industrialization and a clean and safe marine environment are totally indispensable nowadays to life on Earth, man is unconditionally bound to live with the two realities - industrialization and a clean and safe marine environment.

The present project is an attempt to vindicate how such a goal could be attained through the prevention and abatement of marine pollution from ships.

Petroleum which has fast become the leading source of energy today is equally the main source of marine pollution. However, other pollutants such as radio active wastes, DDT, mercury, sulphur, etc. are much more hazardous than either crude oil or refined oil products. Yet, from the point of view of amounts transported daily and the frequency of occurrence of spillages as well as losses generally incurred following pollution incidents, oil presents so far the greatest threat to the marine environment.
Although inputs of pretroleum hydrocarbons into the ocean due to marine transportation activities account for only 35 percent of the total oil inputs per year (NAS), it is the latter percentage input that is largely accountable for the rapid deterioration of the marine environment at least for the last thirty years or so. Equally true is the fact that marine pollution in general stemming from marine transportation activities increased tremendously the last few decades.

Generally, it is much easier to control pollution originating from marine transportation activities than it is to do same with pollution from other sources. This is because shipping is an international enterprise and regulations relating to it could possibly be applied at a global scale. As a result, marine pollution from oil, chemical liquid substances, packaged goods, sewage, garbage, etc. arising from marine transportation activities stands a better chance of being effectively controlled than marine pollution from other sources.

In the light of the above, this project has been based essentially on marine pollution from ships, but special stress has been laid on pollution from oil.

In order to ward off the imminent danger from marine pollution, a lot of effort has been made by both the national and the international organizations.

The fight against marine pollution has been championed by the UN which had long felt the need to protect the marine environment from pollution. To do this, it established organisations that have brought together governmental and non-governmental bodies in search of lasting solutions to the marine pollution. Besides, the UN has adopted the Law of the Sea Convention intended to establish maritime boundaries, regulate the marine environment protection as well as the exploration and exploitation of same.

Nevertheless, it required more than just volumes of regulations and recommendations or even ages of verbal warnings for effective joint action to be taken against marine pollution.
Serious tanker casualties like the TORREY CANYON (1967) and the AMOCO CADIZ (1978) which dealt a severe blow on the shipping community and the society as a whole were necessary to spur the shipping world for joint action against marine pollution.

The said catastrophes proved beyond any doubts that marine pollution had fast become a serious problem and a force to reckon with. The casualties did pose as a challenge to IMO and other international organisations directly concerned with environmental protection. Their joint reaction resulted, as it were, in the introduction of much more stringent regulations on maritime safety and marine pollution control. How far these instruments would be effective as tools for pollution control would be determined by the ability and will to implement such instruments by Maritime Administrations and the shipping industry.

In Cameroon, the situation appears to be even worse. It is evident that the danger from marine pollution is imminent but adequate preventive and combative measures are not yet taken. Up-to-date, the Merchant Shipping Code is still silent on the pollution issue. By the by, unless concrete measures are taken immediately to control the situation it might be too late!

In point of fact, one of the greatest challenges to nations, at all times, has been and still is to hand down to posterity a better world than was inherited. A nation would be considered to have given in to such a challenge if it fails to protect and preserve amongst other things, marine life, an indispensable asset to humanity.

With a birth rate of 42.3 per 1000 and a death rate of 19.4 per 1000 (UN 1975 - 1980 estimates), it is evident that Cameroon's population is rapidly increasing. To sustain such a fast growing population for countless years to come requires a sound economy backed on the one hand by a healthy and active population and on the other hand by a sizeable stock of natural resources. There is therefore little or no hope for future generations if the nation's marine environment is partially or totally transformed into a wet desert.
In order to avert the impending danger, the Republic of Cameroon is unconditionally bound to take immediate steps leading to effective participation in the on-going struggle against marine pollution.

To do the foregoing, she would be required to set up a good Maritime Administration sufficiently equipped to carry out, amongst other things, the processes of ratification and/or adoption and implementation of marine safety Conventions and related instruments as well as establish effective combative arrangements should the preventive measures fail at any time.
GENERAL RECOMMENDATIONS

1. Immediate steps should be taken to ensure the ratification or the adoption and implementation of Conventions and related instruments of particular importance to Cameroon on marine pollution control and safety of navigation.

These include the following:


2. Legislative measures should be taken to prohibit all deliberate pumping of oil, oily wastes or tank cleanings or bilge cleanings or sewage or disposal of garbage into the sea or any other navigable waters within national territory. It should be strongly recommended that all spills minor or major, operational or accidental be reported as soon as possible to the competent service of the Merchant Shipping Department by the polluter.

3. The MSD in collaboration with the National Ports Authority should ensure by way of regular inspections that all ships calling at the national ports have valid certificates on pollution prevention and/or maritime safety and are in the best state of seaworthiness.

4. The Merchant Shipping Department should step up surveillance and control missions. This would check deliberate discharges of pollutants into the sea and possibly eliminate substandard ships that ply the national waters.

   In order to achieve this it is necessary that the Policing and Maritime Rescue Bureau, charged with such functions, be enabled to discharge them effectively. This would require amongst other things:

   a) Provision of suitable surveillance boats and safety equipment; and
   b) Availability of duly qualified personnel to man the vessels and carry out surveillance and safety inspections.

5. The National Ports Authority should make it imperative unconditional that ships intending to call in any of the national ports announce their arrival and forward their manifests, at least 24 hours, prior to their arrival.
6. The National Ports Authority should issue definite instructions based on the Merchant Shipping Code and International Conventions and related instruments prohibiting the rampant discharge or disposal of any pollutants (sewage, sludge, bilge, ballast water, oily wastes, noxious liquid substances, garbage) within port areas. Such pollutants must be discharged in reception facilities. The latter must be provided before such regulations issue.

The enforcement of such regulations would require the joint efforts of the MSD, the Navy, the Police, the Gendarmerie Brigarde, the Customs, the Health Services, etc.

7. It is absolutely necessary that the oil industry be heavily involved in the scientific research and other programmes the Government is undertaking to prevent and/or combat marine pollution.

8. It is very important too that the task of detecting and reporting spillages within the territorial waters be a combined effort from the Navy, the MSD, the National Ports Authority, the Customs, the fishermen, etcetera. It should, in short, be everyone's duty to render such services which would contribute to the national struggle against marine pollution.

9. Regional and bilateral co-operation in the fields of marine pollution prevention and contingency planning should be established.

10. In order to be at the vanguard of recent developments in the areas of maritime safety, pollution control and marine transportation, Cameroon should regularly be represented both at the IMO Assembly and Committee meetings and at the various international symposia, seminars, and workshops dealing with such issues.
A) One cross (*) stands for Periodicals.

(1) Predicast file B 84 on World Population
(3) AMERICAN TIME MAGAZINE No 18 of April 30, 1984. AMOCO CADIZ. May Have to pay $US 2 billions in Damages, page 27.

B) Two crosses (**) stand for Other sources of information.

(1,2) The Law of the Sea Convention, Chapter I.
(6,7) IMO Publication, Petroleum in the Marine Environment, 1981.
(8) Overview of IMO's International Marine Pollution Regulations and Guidelines by Y. Sasamura, Director, Marine Environment Division, IMO
(9) IMO, What it is, What it does, How it works - IMO publication.
(10,11,12) Speech delivered by the Secretary General of IMO on the World Maritime Day, 1984 pages 6 - 8.
(13) Extract from Article 17 from SIRENE, a UNEP publication entitled Decouverte de P'etrole en Afrique de l'Ouest et du Centre" by Mohamed Tangi (Environment Management Officer for the Maritime Region).
(14) Europa Year Book, 1983.
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AFRICA: GEOGRAPHICAL LOCATION OF THE REPUBLIC OF CAMEROON.
REPUBLIC OF CAMEROON

MAIN PORTS:

- : Sea Ports
- : River Port

Yaounde

Nigeria Benue

Gabon

Congo

Equatorial Guinea

Central African Republic

Lake Chad

Limbe

Douala

Kribi

Ndian
SOURCE: Rapport de Mission en République du Cameroun, 24 janvier au
6 février 1983 sur la Préparation d’un Plan d’Intervention contre
DRAFT CONTINGENCY PLANS FOR ACCIDENTAL MARINE POLLUTION IN CAMEROON

OUTLINES

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Yaounde, 16 December 1983
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This document presents the draft outline of anti-pollution action that would be carried out in the event of emergencies due to the accidental spill into the sea or maritime zones of large quantities of petroleum products or other toxic substances likely to cause serious marine pollution. It provides the administrative and structural framework for the action which remains to be clearly defined in the document to be elaborated from the outline.

The purpose of the action is containment and clean-up aimed at safeguarding human life, reducing material losses and damage to the marine environment and its resources.

Three draft plans are presented. The first one is the National Marine Pollution Contingency Plan which covers the entire national territorial waters broadly, and in particular, the coastal zones. The other two are plans for specific maritime zones with particular activities and elevated pollution risk, namely: the Douala-Bonaberi Port and Limbe.

In the event of a call from a neighboring state for assistance in fighting accidental marine pollution, it is the national plan that shall respond under the terms of the appropriate regional and subregional conventions yet to be established. The national plan can call on the resources of the two local plans as need be, and assist them also as need be under conditions to be defined in the elaborated document.

The first local contingency plan is for the Douala-Bonaberi Port where the need for the plan is justified by the volume and nature of its maritime activities, its crucial importance to the economy of Cameroon, and extensive and costly structural investments. Besides, the Douala-Bonaberi Port is also one of the principal economic gateways to landlocked Chad and the Central African Republic.
The second local contingency plan is for Limbe on account of the coastal population, and coastal infrastructures, particularly, the port and the SONARA oil refinery. The risk of an oil spill is heightened by the dangerous rocky nature of the coast as well as the large crude and refined oil traffic into and out of the refinery. Spills resulting from the offshore wells or from oil traffic to Malabo (Equatorial Guinea) could also have serious impacts on Limbe which is directly on the Atlantic Seabord. Besides the town, there are a large number of fishing villages and inhabited islands that would be adversely affected by a serious oil spill.

This draft has been prepared in consultation with a number of relevant documents from the Environment Protection Division of the International Maritime Organization (IMO). It has also benefited from experiences recently acquired from a training course on accidental marine pollution in France (INPOPOL). The first draft of the outline was discussed, modified and adopted by an interministerial group of directly concerned technical services in Douala on April 20, 1983.

In drawing up these contingency plans, it is understood and assumed that companies carrying out oil exploration or exploitation within the national territorial waters and the exclusive economic zone of Cameroon are required to set up a local contingency plan that is independent of the national contingency plans described above for the purpose of handling emergencies within their zone of operation. The nature of each of these local plans will depend on its scale and conditions of operation, and each is supposed to be fully integrated into the national plan so that emergencies beyond the means of the oil company can be properly and effectively handled.
I. THE NATIONAL MARINE POLLUTION CONTINGENCY PLAN

A. Definition:

The national marine pollution contingency plan (NCP) is an emergency plan for fighting accidental spills of large quantities of oil or other toxic substances within the national territorial waters and coastal zones. The NCP may on request participate in emergency operations elsewhere in the subregion under the terms of international or future subregional conventions to which Cameroon is adherent.

B. Justification:

Based on a number of studies by the United Nations Department of International Economics and Social Affairs, the subregion comprising the marine and coastal regions of Nigeria, Cameroon, Equatorial Guinea, Sao Tome and Principe, and Gabon (Zone IV) has the highest risk of accidental marine pollution from oil spills principally due to large offshore production, high shipping density, and the presence of major ports and refineries. For Cameroon, the risk is further accentuated by the enclaved nature of the coastal region (presence of Malabo Island) and the convergence into it of major ocean currents bringing in pollutants from far and near, and stagnating circulation.

C. Objectives of the plan:

1. Containment of the spill, clean-up, and salvage of life.
2. Acquisition and preparation of elements for claims.
3. Information and guidance of affected populations.
4. Response to subregional emergencies under appropriate terms and conventions.

D. Elements of the National Marine Pollution Contingency Plan

1. Reconnaissance and Surveillance (RS)

A. Duties:

To report to scene, detect, locate, investigate and report spills to the Command Structure.

B. Strategy:

Divide the national territorial waters into zones and assign to service agents for routine patrol.
C. Assignment:
Naval and Air Force, Merchant Marines, Maritime Fisheries (MINEPIA),
National Ports Authority (CNPC).

2. Command Structure:
The Command structure shall be known as the Standing Committee for Emergen-
cies at Sea (SCES).

A. Duties:
1. Direct the execution of the NCP,
2. Select and duty the Command Team (NCT),
3. Report actions, progress and results of operations to Government,
4. Advice Government on the training of operations personnel and the
   acquisition of equipment and materials.

B. Strategy:
Convened by its nominated chairman known as Commander of Operations (CO)
after due consideration of the RS report of an incident, SCES shall then
select and duty the National Command Team NCT from a standing Call List SCL.

C. Composition of SCES:
SCES shall be made up of competent representatives of:
1. Ministry of Armed Forces (Naval + Air Forces)
2. Ministry of Transport (Ports Authority, Merchant Marines, National
   Meteorology),
3. Ministry of Equipment,
4. Ministry of Mines and Energy (Refinery, Oil Companies),
5. D.G.R.S.T. (MAB)
6. Marine Sciences Experts (University of Yaounde)
7. Municipalities (Douala, Limbe, Kribi etc.)

3. The National Command Team NCT

A. Definition:
The NCT is the trained team that actually handles the operations on the
scene. It is constituted depending on the nature and location of the spill,
by the SCES from a stand-by Call List to be composed as shown below.
B. Duties:

1. The NCT plans and directs the operation,
2. Selects both equipment and personnel for operation,
3. Plans and provides operations support,
4. Administers the operation - keeps records and report progress to the SCES.

C. Structure:

NCT is made up as follows:

1. Trained technicians for the operation of vehicles, (sea, air, land etc,) for transportation of equipment and personnel.
2. Trained technicians for the operation of clean-up equipment,
3. Trained personnel for containment and removal of oil from water or spraying with dispersants, etc.
4. Logistical support for surveillance and monitoring from ships, planes, land vehicles.
5. Marines scientists for studies and impact assessment (biology, chem.).
6. Ad hoc bureau and operation centre.
7. Communications equipment and personnel.
8. Security to seal off and control access to operation area.

4. The National Command Team Call List NCL:

A. Definition:

This shall consist of a list of persons trained to handle and direct operations at sea, and likely to be called upon in the event of an emergency at sea. It shall also consist of an inventory of all available materials and equipment capable of being used in an operation. The persons and materials may be normally engaged in regular duties from which they are called and temporarily detached in the event of an emergency.

B. Composition:

Information for the NCL shall be contributed by the following services:

1. Ministry of Armed Forces - Naval + Air Forces,
2. Ministry of Transport - Ports Authority, Merchant Marines, Meteorology,
3. Ministry of Territorial Administration - Governor's Office of the Littoral Provinces (S.W., Littoral and Central-South),
4. Ministry of Information and Culture,
5. National Security and Gendarmerie,
6. Oil Companies and refineries (ELF Serepca, Gulf, Pecten, SONARA etc).
7. D.G.R.S.T. (MAB and IRZ - Fisheries Research Centre),
8. University of Yaounde - Faculty of Sciences,
9. Ministry of Animal Breeding and fisheries,

5. Materials, Equipment and Training

SCES shall arrange the acquisition and deployment of specialized materials and equipment as well as training in their use for especially services not routinely engaged in maritime activities.
II. THE DOUALA-BONABERI PORT CONTINGENCY PLAN

A. Definition:

The Douala-Bonaberi Port Contingency Plan (DCP) is an action plan for dealing with emergencies at the Douala Port and its vicinities resulting from the spill of oil or other toxic substances. The plan shall cover all land-based ports infrastructures, vessels berthed at the port or within the estuary of the Wouri.

B. Justification:

The Douala Port including the extensions in Bonaberi, is the principal life-line of Cameroon's economic viability (also that of Chad and Central African Republic). On account of its volume and fragility, oil, one of the principal goods routinely handled at the port, poses a serious threat to all other ports infrastructures including human life and vessels. Consequently, an action plan for dealing rapidly and effectively with the spills of especially oil that could cause serious explosion, fires, etc. is imperative and extremely pressing.

C. Objectives of the Plan:

1. Containment of spill and resulting effects, clean-up, and salvage of life,
2. Response to ther national emergencies at sea under appropriate conditions to be defined.

D. Elements of the Douala Port Contingency Plan:

1. Reconnaissance and Surveillance (RS)
   A. Duties:
   1. The main function of RS shall be to detect and preempt emergencies by indentifying and aborting potentially dangerous situations.
   2. In the event of an already escalating emergency, it shall locate, assess and report the incident to the Douala Port Emergency Command Structure.
   B. Assignment:

Douala Port Security services for land-based structure, and Naval Forces and Merchant Marines for vessels in the port or in the Wouri estuary.
2. The Command Structure: Douala Port Emergency Command Structure (DECS)

A. Duties:

1. Direct the execution of the Douala Port Contingency Plan (DPC) under the guidance of the Commander of the Douala Port.
2. Select and duty the Douala Port Command Team (DCT).
3. Report actions, progress and results of operations to the concerned authorities.
4. Advice the management of the Douala Port on measures for the security of activities, the acquisition and deployment of emergency equipment and materials, and training.

B. Strategy:

2. DECS shall be convened by the Commander of the Port immediately on receiving the RS report.
2. DECS shall then select the DCT for the operation from the Douala Port Emergency Call List.

C. Composition of DECS:

1. The Commander of the Douala Port - Commander of Operations.
2. Director of Merchant Marines.
3. Director National Meteorology.
4. Commander of Naval Forces.
5. Directors of Oil Companies.

3. The Douala Port Command Team (DCT)

A. Duties:

1. DCT shall plan and direct the actual field operations under the guidance of the Commander of Operations.
2. Select equipment, materials and personnel for operation.
3. Organize and provide operations support.
4. Administer operations records, report progress to the DECS.

B. Composition:

DCT shall be made up from the stand-up call list of equipment and personnel as follows:

1. Security officers to seal off and control access to operation areas.
2. Trained technicians to operate vehicles and equipment.
3. Trained personnel for containment, salvage and other operations.
4. Logistical support for surveillance and monitoring.
5. Marine scientists and other experts for full impact assessment and studies.
6. Communications equipment and personnel.

4. The Douala Port Emergency Call List (DCL)

A. Definition:

This is a list of trained persons and specialized equipment and materials from a number of concerned services (identified below) likely to be called upon in order to carry out operations due to emergencies at the Douala Port and Vicinities. The list will not be exhaustive, and the number and type of personnel and equipment selected for each operation will depend on the nature of the emergency.

B. Composition of DCL:

1. Ministry of Armed Forces - Naval Forces
2. Governor of Littoral Province Municipality of Douala.
3. National Ports Authority (ONPC) - Commander Douala Port.
5. Ministry of Information and Culture.
6. University of Yaounde (Faculty of Sciences)
7. D.G.R.S.T. - MAB.

5. Materials, Equipment and Training

DECS shall advice the services on the DCL and about training and the acquisition of equipment and materials.
III. THE LIMBE ACCIDENTAL MARINE POLLUTION CONTINGENCY PLAN

A. Definition:

The Limbe Contingency Plan (LCP) is an action plan for dealing with emergencies at sea within the vicinity of Limbe and coastal villages resulting from the accidental discharge into the sea of large quantities of oil and other toxic substances.

B. Justification:

The Port and town of Limbe at the shores of Ambas' Bay on the Atlantic Ocean, are dotted with numerous volcanic rocks and islands which make access to the shores dangerous and almost impossible for large vessels which must be guided into berth at sea. With the activities of SONARA oil refinery and off-shore platforms nearby, the risk of accidental discharge of large quantities of oil into the sea is very high and omnipresent. Consequently, a stringent contingency plan is necessary to protect the infrastructures of the port and refinery as well as coastal villages and islands.

C. Elements of the Limbe Contingency Plan:

1. Reconnaissance and Surveillance (RS)

A. Duties:
To detect, locate, investigate and report spills and other emergencies of scale.

B. Assignment:
National Ports Authority (ONPC) and SONARA.

C. Strategy:
Equip regular security patrol vessels with equipment and personnel for oil pollution control, frequent patrol of high risk areas.

2. The Limbe Emergency Command Structure (LECS)

A. Definition:
LECS shall be the standing committee for Emergencies at Limbe and vicinities as defined above,
B. Duties:

1. To direct the execution of the ICP under the guidance of Commander of Operations.
2. Select and duty of the operation Command Team (OCT).
3. Follow up and report operation to Government and other concerned bodies.

C. Strategy:

1. LECS shall be convened by the nominated Commander of operations on the basis of the RS report.
2. LECS shall meet and select and duty the Operations Command Team from the stand-by call list.

D. Composition of LECS:

1. Ministry of Armed Forces - Naval + Air Forces.
3. SONARA Oil Refinery.
5. Governor's Office - South West Province.
7. D.G.R.S.T. - IRZ (Fisheries Research Centre and MAB).
8. Recognized marine scientists.

The Limbe Command Team

A. Duties:

1. LCT will plan and direct the execution of field operations.
2. Select equipment, materials and personnel for the operation from the Limbe Call List (LCL).
3. Organize and provide operations support.
4. Administer operation - keep records and report progress to the SCEL.

B. Structure:

'LCL shall be made up as follow:

1. Security to seal off and control access to operations areas.
2. Trained technicians for the operation of vehicles and equipment and use of materials.
3. Trained personnel for containment and removal of oil from water, beaches, etc.
4. Logistical support for surveillance and monitoring from ships, planes, helicopters and ground vehicles.
5. Marine Scientists for research and studies aimed at impact assessment.
6. Communications equipment and personnel.

4. The Limbe Command Team Call List (LCL)

A. Definition:

This is a list of persons, services, equipments and materials likely to be called upon in order to plan and execute operations due to emergencies in the coastal waters of Limbe. SCEL shall constitute the LCT from the LCL.

B. Composition of LCL:

1. National Security and Gendarmerie - Limbe,
3. Governor's Office - S.W. Province.
5. Merchant Marines.
8. D.G.R.S.T. - Centre for Fisheries Research (IRZ), MAB.
10. University of Yaounde - Faculty of Sciences.

5. Materials, Equipment and Training

LECS shall advice on training and seek national and external assistance within the terms of the existing conventions for the acquisition of equipment and materials.