



INTERNATIONAL MARITIME ORGANISATION
UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN



Protecting the Mediterranean against Maritime Accidents and Illegal Discharges from Ships



REMPEC

REGIONAL MARINE POLLUTION EMERGENCY RESPONSE CENTRE FOR THE MEDITERRANEAN SEA

TOWARDS SUSTAINABLE DEVELOPMENT IN THE MEDITERRANEAN REGION

Dear reader,

This publication intends to provide you with state of the art information about the Mediterranean Action Plan's concerns and achievements in protecting our regional sea against maritime accidents and illegal discharges from ships, which is one of the pillars of our activities.

The concerns of twenty countries and the European Community, known as the Contracting Parties to the Barcelona Convention that gave birth to our MAP, are clearly described and properly documented in this publication.

The response to these concerns focused on reacting to emergencies at the regional level. Now MAP has moved further when it marked a milestone that crowns its efforts, on January 25, 2002 with the signature in Malta, by 15 Mediterranean countries and the EC, of the new Protocol Concerning Co-operation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea.

In other words, once this new Protocol has entered into force, the Mediterranean countries will be committed as well to co-operating in responding to maritime accidents and illegal discharges from ships. Most importantly they will be committed to preventing them.

The birth of this new Protocol coincided with the 25th anniversary of REMPEC, a centre of excellence and a model of fruitful co-operation and synergy among international bodies, in this case the MAP and the International Maritime Organisation (IMO), with the support of the Euro-Mediterranean Partnership.

The Protocol is one more key step towards the MAP's ultimate target, that is, to protect the Mediterranean from all sources of pollution and, in so doing, further pave the way towards sustainable development.

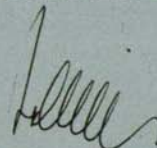
This publication is part of a series of seven that have the common denominator of informing you about the Mediterranean region's leading commitment towards sustainable development. The other publications focus on a number of issues: saving biodiversity as part of our life heritage; cleaner production; working for a sound coastal management; the MAP legal framework, and the updated review of the MAP and its achievements towards sustainable development.

Two other publications complete the series. They deal with reducing land-based pollution, which represents over 80% of all sources of pollution in the Mediterranean Sea, and with the MAP operational strategy for this purpose.

You may take this as a chance to be even more involved in our activities and commitments to sustainable development for the sake of our present and that of future generations.



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1. Introduction

Ship generated marine pollution was one of the issues given a very high priority by the fathers of the original Mediterranean Action Plan when it was created in February 1975. It was further evidenced a year later when sixteen Mediterranean coastal States and the European Community formulated and adopted, in addition to the Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention), a Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (Emergency Protocol). Moreover, at the same time they decided to create the first in the world Regional Centre dedicated to combating oil pollution, now known as Regional

Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).

All this should not come as a surprise taking into consideration a series of massive oil spills recorded in the late 1960s and early 1970s, and the evidence in the form of tar balls or other oil deposits that could be found on practically every beach along the main shipping lanes. Mediterranean, being one of the seas with an extremely high traffic density, was not an exception.

In fact, hardly anyone outside the scientific community was aware of the presence in the sea of pollutants other than oil since these could only

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be determined using one or another analytical method, while oil was there to be seen by all. The perception by general public of “marine pollution” was therefore more often than not directly associated with oil pollution, and as a consequence, shipping in general was considered a major cause of pollution of the marine environment.

Although in the years that followed observation and scientific evidence have shown that most marine pollution originates on land, the contribution of ship-generated pollution should not be disregarded as a serious threat to the health of the oceans in general, and to the Mediterranean Sea in particular.

When in the aftermath of the 1992 United Nations Conference on Environment and Development (UNCED) the Mediterranean

coastal States and the EC embarked on the process of revision of the original Barcelona System, with a view to bringing it in line with the changing environmental priorities, they inevitably addressed pollution of the marine environment by ships. In fact, they gave considerably more weight to the prevention of routine and illicit ship-generated marine pollution, in addition to defining in more detail their goals in the field of preparedness, response and co-operation in case of accidental marine pollution.

The complete revision of the 1976 Emergency Protocol and its replacement in January 2002 with the new Protocol addressing all aspects of pollution from ships clearly demonstrated the determination of the Contracting Parties to further reduce the contribution of the ship-generated pollution to the pollution of the Mediterranean Sea in general

2. Maritime traffic in the Mediterranean

2.1 Characteristics

For thousands of years the life, work and welfare of the peoples living on the Mediterranean shores have been closely associated with sailing and shipping in general. Fishermen were probably the first to set out to sea, and traders followed in search of new markets for their goods. Even in those early days it was understood that, notwithstanding all risks, trading by sea had advantages over trading by land: goods moved faster and ships could carry more merchandise than caravans. Transport by sea was cheaper too. These aspects of shipping did not change until our days: it remains the most important, the safest,

the cheapest, and last but not least, the most environmentally friendly way of moving goods over long distances.

The nature of shipping remained unchanged or changed very slowly for a very long period, as well as the technology of ships and the maritime navigation. It is only over the last fifty years that shipping went through a succession of drastic changes that completely transformed all aspects of this venerable old industry. These changes affected the size, shape and speed of ships, their propulsion, equipment on board, communications, ways the cargoes are carried, ports and other infrastructure, management of

ships, and even the profiles and size of their crews. New regulations were introduced through the efforts of the International Maritime Organization (IMO) that concerned primarily the safety of navigation, but also the protection of the marine environment.

In recent years the shipping in the Mediterranean, like in many other regional seas, became a very complex activity. It comprises the carriage of passengers, general cargoes in both traditional way and in containers, livestock and cars, dry and liquid bulk cargoes, and many other goods, resulting in the co-existence of various types and sizes of vessels. Maritime traffic in the Mediterranean is characterized by the existence of a large number of ports in the region (more than 300), but also by a significant volume of traffic which only transits the Mediterranean Sea, without ships entering any of these ports.

2.2 Some figures and estimates

Traffic

The density of merchant vessels traffic in the Mediterranean, which represents less than 1% of the total area covered by the world's oceans, is particularly high.

It is estimated that approximately 30% of the



Darko Domovic

international sea-borne trade volume originates or is directed to the Mediterranean ports or passes through the Mediterranean Sea and that some 20-25% of the world's sea-borne oil traffic transits the Mediterranean.

Although the figures quoted below are estimates and might not be entirely accurate, they should serve to illustrate the density of maritime traffic in the region:

- 2,000 merchant vessels of over 100 GRT are at sea at any moment;
- 250-300 of these are oil tankers;
- 200,000 merchant vessels of over 100 GRT cross the Mediterranean annually.

The traffic is particularly congested in the narrow passages through which ships enter and exit the Mediterranean:

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REMPEC plans to undertake a study aimed at identifying principal routes, origins, destinations and quantities of goods carried or planned to be carried by sea in the region.

- Straits of Gibraltar: the exact figures are not available, but an estimate of 80,000 vessel transits annually has often been quoted in literature;
- Suez Canal: 14,141 transits in the year 2000;
- Çanakkale Straits/Sea of Marmara/Istanbul Straits complex: the traffic through this international waterway, which links the north-eastern part of the Mediterranean, namely the Aegean Sea, with the Black Sea, was estimated

at 50,000 ships annually (1997). It increased significantly in the recent years. The estimated traffic was 15 ships per day in 1938, 125 ships per day in 1995 and the above figure for 1997 corresponds to 137 ships per day. At least one LPG carrier is estimated to pass through this waterway each week.

Being aware of a general lack of reliable data on traffic patterns and density in the Mediterranean, in particular those relating to the transportation of oil and other hazardous substances, REMPEC



plans to undertake, in collaboration with specialized industry associations and BP/RAC a study aimed at identifying principal routes, origins, destinations and quantities of goods carried or planned to be carried by sea in the region.

Fleet

Defining the composition of the "Mediterranean fleet" on the basis of flag state is a practically impossible, since three Mediterranean countries are among the largest Flag States in the world (Cyprus, Greece, Malta) and two of these (Cyprus and Malta) are known as open registers. Out of all ships registered under the Mediterranean flags, Greece with 28.8% (in 1996), Cyprus (24.9%) and Malta (20.4%) accounted for almost three-quarters (74.1%) of the tonnage registered in the Mediterranean.

However certain observations regarding ships trading in the region could help in describing the merchant fleet sailing daily in the Mediterranean, which includes:

- ships engaged in national coastal navigation, usually registered in the country concerned;
- ships keeping regular lines between Mediterranean countries, often flying the flag of either of them;
- ships calling into Mediterranean ports for commercial purposes that may be under any flag;
- ships transiting the Mediterranean that may also be under any flag.

A large discrepancy can be noted between the size of the fleets of some Mediterranean countries and their respective shares in the Mediterranean maritime transport.

Ports

In 1995 there were 305 ports scattered along the Mediterranean shores, majority of which were located in densely populated urban areas. More than half of these ports were to be found in Italy, Greece and Spain. Mediterranean ports fall in three major categories:

- multi-purpose ports offering wide range of services to their users;
- single-user facilities whose infrastructure might belong to a state owned, parastatal or private organization;
- small ports, including fishing ports, serving an area and offering limited services to ships calling in them;

In addition, a large number of marinas and pleasure craft ports also exist in the Mediterranean.

2.3 Oil traffic in the Mediterranean

The Mediterranean Sea is the major route for transportation of crude oil from the oil fields in the Middle East and North Africa, and oil ports in the Black Sea towards the major consumption centres in Europe and also in the North America. Laden tankers enter the Mediterranean Sea

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The most important oil traffic lane (an estimated 90% of total oil tanker traffic) connects Suez Canal and the Sidi Kerir terminal of the Sumed pipeline in Egypt with Gibraltar, passing between Sicily and Malta and then following the coasts of Tunisia, Algeria and Morocco.

through the Suez Canal and the Çanakkale Straits, while others load their cargoes in terminals in Turkey, Syria, Egypt, GSP Libyan Arab Jamahiriya, Tunisia and Algeria. Their voyages either finish in oil ports on the southern shores of Europe (Greece, Croatia, Italy, France, Spain) or they exit the Mediterranean through the Straits of Gibraltar on their way to the North Western Europe. In general the main tanker traffic flows in the East-West direction. South-North traffic routes occasionally intersect three principal East-West lanes, join them or branch off from them.

The most important oil traffic lane (an estimated 90% of total oil tanker traffic) connects Suez Canal and the Sidi Kerir terminal of the Sumed pipeline in Egypt with Gibraltar, passing between Sicily and Malta and then following the coasts of Tunisia, Algeria and Morocco. The traffic on this main axis reduces gradually as it moves westward and branches off towards unloading terminals near Piraeus, in the northern Adriatic, in the Ligurian Sea, near Marseille, and in Spain.

The second important oil traffic route starts from the loading terminals in the Eastern Mediterranean (in Syria and in the Gulf of Iskenderun in Turkey) and after passing Cyprus joins the main axis. During the 1990s this route was used only partially because of the embargo on the Iraqi crude oil exports, which were loaded in the Gulf of Iskenderun.

The third major route connects loading terminals in the Black Sea with the main East-West axis, passing through the Istanbul Straits, Sea of Marmara, Çanakkale Straits, and the Aegean Sea.

Taking into account that the total amount of oil transported by sea in 2000 was estimated at approximately 1715 million tonnes and that the estimated volume of oil (crude oil and refined products) that was carried by sea in the Mediterranean was put in 1999 at some 360-370 million tonnes annually, it appears that approximately 20-25% of oil globally transported by sea crosses the Mediterranean Sea.

2.4 Traffic of chemicals in the Mediterranean

Some of the hazardous and noxious substances, usually referred to as chemicals, are far more dangerous to the marine environment than oil. In addition some of them can be extremely hazardous both to the ship on-board which they are carried and to the handling equipment, but also to human health. However, quantities of these products transported by sea annually is only a fraction of the volume of oil carried by tankers.

Despite the risks associated with the carriage of chemicals by sea data on the traffic of specific products, their volumes and transportation patterns are not available, and at present the understanding of this type of traffic remains vague and incomplete. This refers in particular to the transportation of packaged dangerous goods (substances listed in the International Maritime Dangerous Goods Code - IMDG Code).

On the other hand, existing although incomplete information permits drawing certain conclusions regarding the movements of various chemical substances in bulk.

For example available data on accidents and profiles of key gas carrier operators in the region indicate that the Mediterranean ports handle gas products such as ethylene, LPG, propane, propylene, vinyl chloride monomer and ammonia.

In the LNG (a mixture of hydrocarbons) trade the situation is more clear. The main LNG supply routes for the Southern Europe pass through the Straits of Gibraltar (from Venezuela) and Suez Canal (from Saudi Arabia), but also cross the Mediterranean, connecting LNG producing countries in the North Africa with France, Italy and Spain. The two main regional producers of LNG are Algeria and Libya, however not all LNG exported by these countries is carried by ships. A trans-Mediterranean gas pipeline connects Algeria and Italy via Tunisia and another one linking Algeria and Spain is being considered. Although transportation of LNG through pipelines reduced the number of LNG carriers on Algeria-Italy route, the traffic between Algeria and Turkey substantially increased after the commissioning of an LNG reception terminal on Turkey's Sea

of Marmara in 1994. The two countries also signed an agreement for the supply of 1.5 million tonnes per year of Algerian LNG to Turkey for 20 years.

Solid, potentially hazardous, products are transported in bulk in the Mediterranean Sea in large quantities, although concrete figures for volume of this traffic are not available. It is however known that certain ores such as alumina, pyrites, bentonite, magnesite and potash, as well as phosphates and fertilizers are handled in a number of Mediterranean ports.

Little information also exists concerning the movement within the Mediterranean of liquid chemicals in bulk. However, an analysis of the tank coatings of some of the major chemical tanker fleets operating within the Mediterranean indicates that they probably transport a whole range of products.

Stainless steel tanks are used for the transportation of acids and caustic soda. Aromatic solvents,

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alcohols, ketones, halogenated compounds such as carbon tetrachloride, and esters such as amyl acetate are transported in zinc silicate coated tanks. Epoxy coated tanks are used for alkalis and glycols. Polyurethane coated tanks can be used for products carried in epoxy coated tanks and for some solvents compatible with zinc silicate, whilst rubber-lined tanks are used for carriage of corrosive substances such as hydrochloric acid. Since fleets operating in the Mediterranean all have chemical tankers with the entire range of these coatings, it is understood that at least above listed chemicals are regularly transported in the Mediterranean.

The current state and expected development of maritime traffic within and outside the region suggests that the Mediterranean Sea is and shall still remain a major route for transportation of goods.

2.5 Future trends

The available statistics show that the total volume of seaborne oil trade in the Mediterranean did not change significantly since the late 1980s, but the lack of data on traffic of various chemicals (gases, liquids and solids) would only allow speculations regarding the volumes involved and transportation patterns of these products.

Nevertheless the current state and expected development of maritime traffic within and outside the region suggests that the Mediterranean Sea is and shall still remain a major route for



transportation of goods from the region itself, but also from the Middle East and Black Sea regions to the North Western Europe and North America and vice versa.

In the oil sector, there is no doubt that if future plans for upgrading and the development of new pipelines in the Middle and Near East come to fruition, these will alter crude oil transport strategies in the Mediterranean, in particular the pipelines linking the Red Sea and the Mediterranean and those linking the Caspian Sea to the Black and Mediterranean Seas.

In the latter case, it is estimated that during the current decade, approximately 80 - 100 million tonnes of crude oil will be produced in the

Caspian region, and a large portion of it might be transported through the Mediterranean.

In the future, it is most likely that sea trade and subsequently the pattern of maritime transport in the Mediterranean will be influenced by such factors as the relocation of industries, adjustments to production techniques and distribution processes, efforts to ensure value-adding at source, an integration of regional markets and an increase in environmental concern. With a view to ensuring the sustainability of such changes the Mediterranean Commission on Sustainable Development (MCSD) is expected to play a catalytic role through discussing and recommending desirable future development patterns of trade, transport and energy sectors.

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3. Ship-generated pollution

The self-cleaning capacity of the sea was for centuries considered more than sufficient to deal with wastes that entered into it as the result of human activities. The same belief applied in particular to wastes originating from ships. The first signs indicating that oceans could not cope with all ship-generated wastes appeared after the introduction of oil as the main fuel for ships, which started in the 1930s and was practically completed by the end of the 1950s. Tar balls and oil deposits became more and more a regular feature of beaches along the main shipping lanes. However it did not take long before the shipping community reacted to this new plague.

The Government of the United Kingdom convened an international conference in 1954, which adopted the International Convention on

Prevention of Pollution of the Sea by Oil. Even the title of the Convention, which became known as the OILPOL Convention, witnessed that the marine pollution from ships was at that time perceived exclusively as oil pollution, and that meant only routine, operational pollution. Oil tankers were still relatively small and massive accidental oil spills were at the time something completely unknown. The States who signed the OILPOL agreed that the International Maritime Organization (IMO) would assume responsibilities for the new Convention as soon as the IMO Convention entered into force. IMO, or the Inter-Governmental Maritime Consultative Organization (IMCO) as it was originally called, was created in 1948 as a specialised agency of the United Nations responsible for dealing with shipping, but the new organization actually came

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into existence only in 1959 following the acceptance of the IMO Convention by a sufficient number of States. The original mandate of IMO comprised only issues of purely technical nature, the most important of which was safety of navigation: the problem of marine pollution was not even recognized in the original IMO Convention.

However, soon after entering the agenda of IMO, prevention of marine pollution became one of the Organization's prime objectives. After notorious "Torrey Canyon" accident in 1967 accidental oil pollution and its prevention, control and combating gave a completely new scope to the meaning of marine pollution from ships. This meaning was further extended by the adoption in 1973 of the International Convention for the Prevention of Pollution from Ships (MARPOL), which in addition to operational and accidental oil pollution also addressed pollution from chemicals, substances carried in packaged form, sewage and garbage.

Contracting Parties to the MARPOL Convention were among the first to recognize the vulnerability of the Mediterranean Sea and it was declared a Special Area, where application of measures for the prevention of pollution of the marine environment from ships, more stringent than in other sea areas, became mandatory.

As the environmental consciousness of both general public and the shipping industry continued to grow steadily throughout the 1980s and the 1990s, and as new scientific evidence became available, other forms of marine pollution generated by shipping were identified and addressed by the world maritime community, within the framework of IMO. During the 1990s

the activities of the Marine Environment Protection Committee (MEPC) of IMO focused *inter alia* on mitigation of damages to the marine environment caused by the use of harmful anti-fouling paints and by the transfer of harmful aquatic organisms in ballast waters. Steps were also taken with a view to reducing the ship generated atmospheric pollution by exhaust emissions, cargo vapour emissions and ozone depleting substances, that could indirectly affect marine environment. Tackling these practically invisible and unspectacular, and yet insidious forms of pollution only confirmed the serious commitment of the shipping world to contribute to the protection of the health of the oceans.

However, despite the emergence of these new issues, the main shipping related pollution problems remain those related to oil and chemical pollution.

It has been recognized and is now widely accepted that maritime transport is by far less important source of anthropogenic marine pollution than land-based discharges, including inputs from industrial effluents, urban and river run-off, sewage and atmospheric inputs from land industry sources. Nevertheless, this did not result in diminishing efforts to bring to an even lower level the contribution of ship generated marine pollution by oil and other harmful substances.

In order to better understand the present concerns regarding marine pollution caused by the maritime transport and the differences in dealing with its two main forms, it is necessary to analyse separately **operational** and **accidental** marine pollution from ships, and to outline their characteristics, causes, measures already taken or those suggested with a view to reducing the

amounts of oil or other harmful substances that ships discharge into the sea.

3.1 Operational pollution from ships

Operational **oil pollution** from ships encompasses a variety of discharges of oil and oily mixtures that are generated on board ships, including oil tankers, as a result of their normal operation. The term includes oil inputs into the sea both from cargo spaces and from machinery spaces of a ship, comprising oily ballast waters, tank washing residues, fuel oil sludge and machinery space bilge discharges.

Ballast waters - In order to retain necessary sea worthiness when not loaded with oil, tankers need to carry ballast on their return voyages to loading ports. On older tankers seawater used to be pumped into the empty cargo tanks to provide for the required stability of the ship. Other ships sometimes have to ballast their empty bunker fuel tanks, in particular when it is necessary to ensure the safety of vessel in severe weather. Ballast waters carried either in cargo or in fuel tanks are contaminated by oil carried before in the same tanks, and need to be discharged before a new cargo is loaded.

MARPOL 73/78 limited the amounts of oil that could be discharged into the sea with ballast waters, and required coastal States to provide reception facilities on land into which contaminated ballast could be discharged and subsequently treated prior to being released back into the sea.

All larger tankers built since 1983 must have either

ballast tanks completely segregated from cargo tanks (segregated ballast tanks - SBT) or dedicated clean ballast tanks (CBT). Older tankers are allowed to discharge less than 15 ppm of oil into the sea when the ship is operating outside special areas. It was estimated that in 1999 some two-thirds of the world tanker fleet had SBT arrangements and it is expected that all pre-MARPOL tankers will be phased out within the next decade.

Tank washing residues - After offloading the cargo, a certain amount of oil remains attached to the tank walls. If the tanks have to be cleaned for e.g. changing of cargo, relatively large quantities of oil may be released. Washing the tanks with sea-water was replaced by "crude oil washing" (COW) in the early 1970s since the solvent action of the crude oil provided a much better cleaning effect and amounts of water needed for final water rinse were much less. MARPOL 73/78 made compulsory the use COW on all new crude oil carriers of 20,000 tons deadweight and above and COW is now applied on a major part of the world tanker fleet. The

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requirement to retain oily residues on board further reduced amounts of oil discharged into the sea as a result of tank washing. In addition all ship repair yards are required to have reception facilities for residues resulting from cleaning of cargo and bunker tanks.

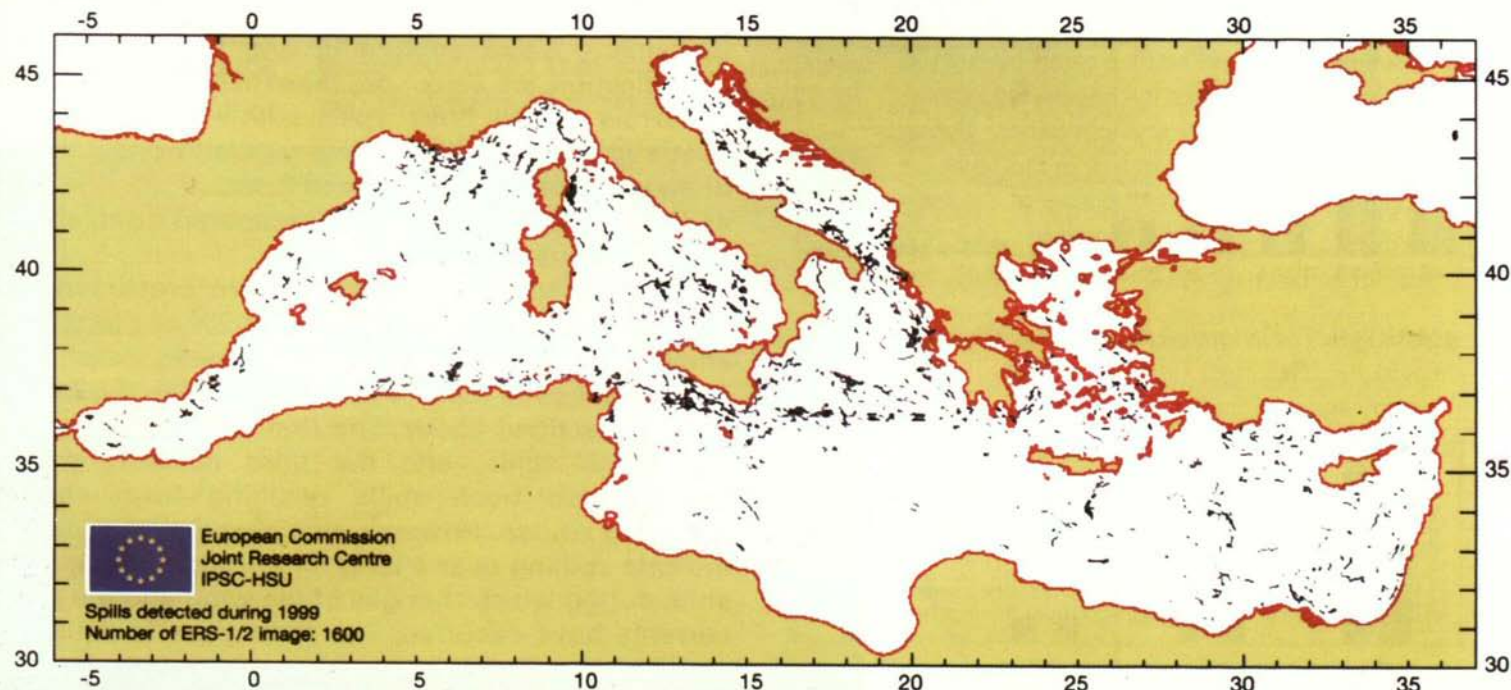
Fuel oil sludge - Fuel oils used by ship engines contain up to 5 percent of contaminants, known as "sludge", which cannot be burned and have to be separated from the fuel. MARPOL 73/38 requires retention on board of sludge separated from fuel and its discharge into reception facilities on land for treatment and disposal. Alternatively, it can be treated on board ships. The presence of "tar balls", sometimes found on the Mediterranean beaches, proves that illegal disposal of sludge at sea is still present.

Bilge waters - Leakages of fuel or lubricating oils in machinery spaces accumulate in the ships'

bilges, and since oily bilge waters have to be periodically discharged, MARPOL 73/78 requires that ports be provided with adequate reception facilities.

Introduction by MARPOL 73/78 Convention, of regulations aimed at limiting or eliminating generation of oily wastes during normal operation of ships, and in particular of oil tankers, and the related improvements in ship design and equipment, were major factors that contributed towards an overall significant reduction of estimated inputs from maritime transport related sources of oil into the world oceans. Particularly important among MARPOL 73/78 regulations were those requiring the retention on board of oil residues and their treatment prior to discharging them into the sea, or alternatively transferring oily wastes to reception facilities on shore, as well as the regulations concerning effluent quality and discharge procedures.

Figure 1:
Fingerprints of illicit vessel discharges detected on ERS-1 and ERS-2 SAR images, during 1999 in the Mediterranean Sea



Within the Mediterranean Sea, which has been declared a “special area” in terms of Regulation 10 of Annex I to MARPOL 73/78, any discharge into the sea of oil or oily mixtures from any oil tanker and any other ship of more than 400 tons gross tonnage is prohibited, and all oil residues must be either retained on board or discharged to reception facilities. Although it is clear that practically all operational pollution in the Mediterranean is in fact illegal, there is evidence that oily waters and residues are still occasionally discharged into the Mediterranean Sea, partly due to the lack of adequate reception facilities in certain ports and terminals.

Between 2002 and 2004 REMPEC will conduct, with the financial support of the European Union, a study aimed at identifying the present status of reception facilities for bilge waters and oily residues in the Mediterranean ports, and at proposing measures for ensuring their availability and adequacy.

The European Commission published in 2001 a study concerning the monitoring of illicit vessel discharges in the Mediterranean Sea that was based on the data obtained through spaceborne surveillance.

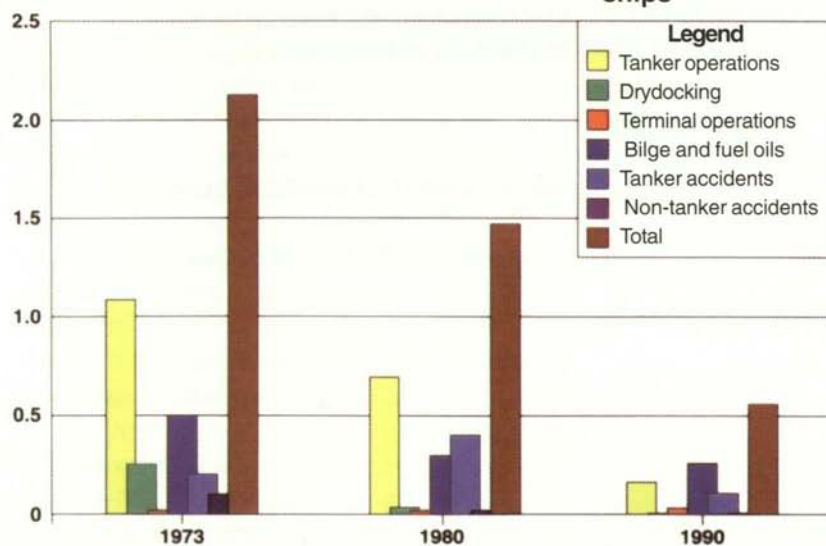
According to the study prepared by the Joint Research Centre of the EC, 1683 spills were detected in 1999 in the Mediterranean. “Fingerprints” of illicit vessel discharges detected during 1999, clearly indicate (Figure 1) that non-compliance with MARPOL 73/78 is still a relatively common practice and that the enforcement of its provisions should be one of the first priorities of the Mediterranean coastal States in coming years.

The estimates of amounts of oil that enter the oceans from ships vary considerably, reflecting different views of authors and different methods applied, although the latter in most cases remain undisclosed.

There is nevertheless a general consensus regarding the reliability of estimates made by the Marine Board of the National Research Council of the United States National Academy of Sciences.

Since the 1970s NRC has published its reports approximately once in a decade and in 1998 IMO summarized estimated global inputs of oil into the sea from maritime transport related sources, based on available NRC reports (Figure 2). The report covering the 1990s is due to be published in 2002, and the estimates for the last decade of the twentieth century are not yet available.

Comparison of NRC estimates indicates a steady decrease over the last three decades of oil inputs from ships and it is likely that the new estimates



More often than not the origins of incidents resulting in oil spills are to be found among the vast but vague group of factors commonly known as "human error".

will indicate a similar trend. Taking into account that approximately 30% of international sea-borne trade in general and some 20-25% of world oil traffic cross the Mediterranean, it is safe to assume that at present the total oil input from ships into the Mediterranean Sea is in the range of 100,000 – 150,000 tonnes/year.

Annex II of MARPOL 73/78 details discharge criteria and measures for the control of pollution by **noxious liquid substances** (chemicals) carried in bulk. Some 250 substances were evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substance) are complied with. The Mediterranean Sea is not a "special area" under Annex II and in it only the general rules apply, which nevertheless do not permit any discharge of residues containing noxious substances within 12 nautical miles of the nearest land.

Estimates of quantities of noxious substances or their residues discharged by ships into the Mediterranean Sea are not available.

3.2 Accidental marine pollution

Large **accidental oil spills** that attract major public attention are remarkably rare. Statistics of the International Tanker Owners Pollution Federation Ltd. (ITOPF), based on spills recorded worldwide in the period 1974-2000, suggest that among all oil spill incidents only 3 % were spills of more than 700 tonnes of oil, 12 % were spills of 7 to 700 tonnes, while 85 % of spills were of less than 7 tonnes of oil. Among oil spills that

were confirmed to be results of classic shipping accidents 58% were of less than 7 t, 29% of 7-700 t and 13% of more than 700 t.

Despite the estimate that accidents participate in the total input of oil into the world oceans with not more than 10 to 15 percent, accidental oil spills generate more attention by general public, media and politicians than all other marine pollution together. They seem to be more "fascinating" than other categories of marine oil pollution probably due to their very nature, that can be roughly described as "concentration": **large quantities** of oil are released onto a **limited sea surface** in a relatively **short period of time**. Affected areas are relatively small as compared to vast ocean surfaces. Even the effects of accidental oil spills are "concentrated", that is, severely damaging only a certain segment of marine biota or coastal resources.

Direct or indirect causes of accidental oil spills are numerous. Most spills from tankers originate from incidents taking place during routine operations in ports or terminals such as loading, discharging and bunkering (e.g. broken hoses, defective valves, etc.), and are small.

Typical shipping incidents, such as a collision, grounding, explosion on board ship (often followed by fire), structural failure, sinking due to adverse weather conditions, etc are more likely to result in losses of larger quantities of oil or in major spills. The infamous big spills recorded over the last three decades such as "Torrey Canyon" (1967), "Amoco Cadiz" (1978), "Atlantic Empress" (1979), "Exxon Valdez" (1989), "Khark 5" (1989), "Haven" (1991), "Aegean Sea" (1992), "Braer" (1993), "Sea Empress" (1996) or "Erika" (1999) all started as shipping incidents.

However, more often than not the origins of incidents resulting in oil spills are to be found among the vast but vague group of factors commonly known as “human error”.

While the complete elimination of operational pollution from ships is perfectly attainable and can be achieved by a combination of application of available know-how and of strict implementation and enforcement of existing regulations, it can be said with a large dose of certainty that it will never be possible to completely eliminate accidental marine pollution. The objective is therefore to reduce as much as possible the risk of marine pollution accidents. The combination of efforts in different fields is required to minimize the risk of an accident occurring, to minimize its consequences if it does occur, and to efficiently cope with the resulting spill when it happens.

Most of the circumstances leading to a spill accident are difficult to predict, however there are other factors that can significantly reduce the risk of accidental oil spills and do not depend on unpredictable events. These include construction of ships in conformity with required standards, proper inspection, maintenance and management of ships, adherence to established and required safe practices in ship and cargo handling,

implementation of recommended safety measures on board ships (tankers and non-tankers), utilization of sophisticated navigational aids and high standard of crews’ training.

In its efforts to make shipping of all types safer IMO incorporated in its numerous safety conventions and recommendations also the measures that render ships less likely to be involved in accidents.

The **International Convention for the Safety of Life at Sea** of 1974 (**SOLAS 74**), considered as the most important of all conventions adopted by IMO, includes special requirements for tankers, regarding e.g. fire safety provisions, inert gas systems, duplication of essential parts of the steering gear and much of the navigational equipment, enhanced inspection programme and emergency towing arrangements. Mandatory ship reporting systems in areas where there are special environmental or navigational concerns enable identification of ships on radar and close following of their courses. Consideration is also being given to the introduction of mandatory transponders that would give details of ships and their cargoes automatically.

Other IMO Conventions dealing with e.g. intervention on the high seas in case of oil pollution casualties (**INTERVENTION**), preventing collisions at sea (**COLREG**), standards of training, certification and watchkeeping for seafarers (**STCW**), and salvage, further contribute towards the reduction of accidental pollution risk. The **International Safety Management Code (ISM Code)** has imposed greater obligations on shipowners to ensure that their ships are not only operated safely but also pay proper attention to the environment.

In its efforts to make shipping of all types safer IMO incorporated in its numerous safety conventions and recommendations also the measures that render ships less likely to be involved in accidents.



Double hulls are intended to reduce the amount of oil lost as a result of a collision or grounding.

Certain provisions of MARPOL 73/78 significantly contribute to reducing the consequences of maritime incidents. The Convention stipulates that new tankers must meet certain requirements regarding subdivision and stability, which are intended to ensure that the ship can survive after being involved in a collision or stranding. It also introduced the protective location of segregated ballast tanks, which are positioned where the impact of a collision or grounding is likely to be the greatest, thus reducing the volume of cargo that can be spilled in an accident. 1992 MARPOL amendments made it mandatory for new tankers to be fitted with double hulls, or an alternative design approved by IMO. Double hulls are intended to reduce the amount of oil lost as a result of a collision or grounding. If the tanker is involved in such an incident the outer hull will absorb the damage, leaving the oil-carrying tanks undamaged. As a result of the "Erika" accident in December 1999, the MEPC adopted in April 2001 a set of new amendments

aimed at accelerating the phase-out of single-hull tankers.

Finally, the adoption in November 1990 of the **International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC 90)** signified the setting up of a global system for preparedness, response and co-operation. The system was further extended in March 2000 by the adoption of the **Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol)** that covers hazardous substances other than oil. These treaties have been designed to facilitate international co-operation and mutual assistance in preparing for and responding to major pollution incidents, to encourage States to develop and maintain an adequate capability to deal with pollution emergencies, and to co-operate and to render assistance when so requested by other Parties.

4. Risks in the Mediterranean

4.1 General notions

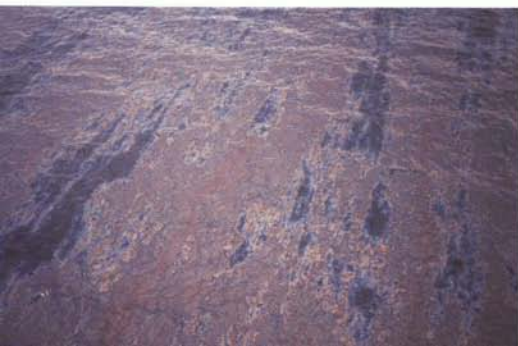
The Mediterranean Sea is often quoted as one of the world seas with the highest risk of accidental pollution by oil and other hazardous substances.

The reasons are a very high maritime traffic density, transportation of large quantities of crude oil and refined products through the region, narrow and congested straits through which ships enter and exit the Mediterranean, large

number of ports, large number of islands especially in certain areas with high traffic density, traffic routes that pass through treacherous and narrow passages such as Bonifacio and Messina Straits.

4.2 Oil spills

REMPEC systematically collects reports on incidents causing or likely to cause pollution of the sea by oil since 1977. 311 such incidents were recorded between August 1977 and December



2000, 156 of which actually resulted in the spillage of oil.

However, only two incidents recorded in the Mediterranean between 1981 and 2000 resulted in spills of more than 10,000 tonnes: 18,000 t from the “Cavo Cambanos” (1981) and a large unspecified quantity, but certainly more than 10,000 t from the “Haven” (1991). On 45 occasions reported spills were of less than 10 tonnes, 27 incidents generated spills of 10-99 tonnes, 28 of 100-999 t, and 5 reported spills were of 1000-9999 t. The quantity spilled in 30 incidents remained “unknown”, however it is unlikely that these quantities were significant.

Number of spills reported annually varied between 2 in 1982 and 11 in 1991, 1992 and 1993 respectively.

The records for period 1981-1990 show that the total amount of oil spilled in maritime transport related incidents in the Mediterranean was 36,476 tonnes, as compared with 21,667 tonnes between 1991 and 2000. The quantity of oil actually spilled in the “Haven” incident in 1991, which was the biggest single incident recorded in the Mediterranean over the last two decades, remains unclear. This incident resulted in the total loss of her cargo of 144,000 tonnes of crude oil, however the major part of it burnt and it was not possible to establish the quantity that actually entered the sea. REMPEC’s list, on the basis of an estimate by the IOPC Funds, quotes the figure of “more than 10,000 t”.

In addition, an estimated quantity of 12,200 tonnes of heavy fuel oil and slops entered the



Mediterranean Sea in 1990 as the result of the spill caused by collision between M O/B/O “Sea Spirit” and M LPG “Hesperus”. Although the incident occurred outside the Mediterranean (west of Gibraltar), spilled oil entered the Mediterranean carried by winds and currents, posing a serious threat to the waters and coasts of Morocco, Spain and Algeria.

In case of marine pollution incidents, the authorities of the affected or threatened country are generally expected to undertake response measures and, through its executive branch, to exercise direct control over response operations or co-ordinate them. Spill response operations in the Mediterranean in the 1981-2000 period were regularly conducted either by the competent national or local authorities or by the spill clean-up contractors under their supervision. The only case that necessitated mutual assistance between the neighbouring countries was the “Haven”, during which the French units assisted Italian in response operations.

In case of marine pollution incidents, the authorities of the affected or threatened country are generally expected to undertake response measures

**INCIDENTS CAUSING OR LIKELY TO CAUSE POLLUTION OF THE
MEDITERRANEAN SEA BY OIL (recorded by REMPEC 1977 - 2000)**

YEAR	TOTAL NUMBER OF REPORTED INCIDENTS	INCIDENTS THAT CAUSED OIL POLLUTION	INCIDENTS THAT DID NOT CAUSE AN OIL SPILL
1977*	4	4	-
1978*	6	4	2
1979*	5	5	-
1980*	7	6	1
1981	14	8	6
1982	7	2	5
1983	11	6	5
1984	7	5	2
1985	11	4	7
1986	8	3	5
1987	7	4	3
1988	8	4	4
1989	17	10	7
1990	9	7	2
1991	15	11	4
1992	15	11	4
1993	20	11	9
1994	20	8	12
1995	11	5	6
1996	24	8	16
1997	16	6	10
1998	16	8	8
1999	24	8	16
2000	29	8	21
TOTAL	311	156	155

* reporting during the period 1977 - 1980 was inconsistent and not complete. In most cases only actual spills were reported and not incidents "likely to cause" spills.





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Collection of data on accidents causing or likely to cause pollution of the Mediterranean Sea by hazardous and noxious substances other than oil started at REMPEC in January 1988.

4.3 Spills of hazardous and noxious substances other than oil

Collection of data on accidents causing or likely to cause pollution of the Mediterranean Sea by hazardous and noxious substances other than oil started at REMPEC in January 1988. Due to uncertainties regarding the type of cargoes of ships involved in incidents, the diversity of products included in the “hazardous and noxious substances other than oil” (gases, liquids, solids) and the variety of ways in which these products are shipped (bulk, packaged form) the data available at REMPEC are less precise than those for oil and do not permit preparing clear statistics or drawing reliable conclusions.

It is nevertheless evident that at least 79 shipping incidents recorded in the Mediterranean between

1988 and 1997 involved ships carrying cargoes that could be considered as “hazardous and noxious”. These included solid bulks (ores, fertilizers, sulphur, various chemical products), liquid bulks (various acids, alcohols, ethers, ammonia, glycols), gases carried in bulk (LPG, propylene, LNG) and a variety of chemical products in packages (pesticides, hydroxides, peroxides, acetylene gas, ethylene oxide, mercury).

Like in case of shipping incidents involving oil, not all accidents involving hazardous and noxious substances actually resulted in the loss of product into the environment. In fact only 21 accidents (27%) recorded in that period actually resulted in the release of the cargo into marine environment while in 58 accidents (73%) the potentially harmful cargo remained unaffected by the incident.

Darko Domovic



5. Mediterranean Policy for dealing with marine pollution from ships

The Intergovernmental Meeting on the Protection of the Mediterranean, convened by the Executive Director of UNEP in Barcelona in February 1975 to consider an Action Plan for the Mediterranean, *inter alia* emphasized the need to pay particular attention to the protection of the Mediterranean against pollution due to the operation of ships. The awareness of the specific problems related to dealing with marine pollution emergencies was

further reflected in several Resolutions adopted by the Meeting. Legal basis for the international co-operation in the fields of prevention, reduction and combating pollution of the Mediterranean Sea was set up a year later when the coastal States and the European Community adopted in 1976 the Convention for the Protection of the Mediterranean Sea against Pollution (the original **Barcelona Convention**). The same Conference

IMO



of Plenipotentiaries which adopted the Convention, also adopted the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency. The Protocol, commonly known as the **Emergency Protocol**, entered into force at the same time as the Convention on 12 February 1978.

The original Barcelona Convention specifically addressed pollution caused by dumping, pollution from ships, from offshore activities, and from land-based sources, co-operation in dealing with pollution emergencies, monitoring and scientific and technological co-operation, as well as liability for pollution damages. In addition, the Convention *inter alia* stipulated the institutional arrangements for the functioning of the regional co-operation system, addressed the mechanisms by which the Contracting Parties could control its implementation, and set up rules for the adoption of additional protocols.

As a legal instrument complementing the Convention, the Emergency Protocol set out the main principles of co-operation in dealing with threats to the marine environment, the coasts and related interests of the Contracting Parties posed by accidental releases or by accumulations of small discharges of oil or other harmful substances.

The 1976 Protocol stipulated commitments of



the Contracting Parties regarding the establishment and maintenance of contingency plans and means for combating marine pollution, monitoring of pollution, exchange of information relevant for preparedness and response, setting-up and maintaining a reliable communication system, and early notification of pollution incidents. It addressed in particular the obligations of the Parties regarding the assessment of the nature and extent of the casualty or emergency, taking measures for avoiding or reducing the effects of pollution, and informing other Parties of such assessments and measures taken. Finally, the Protocol set up the rules guiding the mutual assistance between the Parties and stipulated their commitment to endeavour to assist each other when so requested in case of emergency.

The Protocol also envisaged the existence of a Regional Centre for facilitating its implementation, and the Conference of Plenipotentiaries that

The Barcelona Convention inter alia stipulated the institutional arrangements for the functioning of the regional co-operation system.



Darko Domovic

The new Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II) was adopted in June 1995.

adopted the Protocol established, by its Resolution 7, the Regional Oil Combating Centre in Malta, and defined its objectives and functions.

On the basis of these two legal instruments the Contracting Parties continued developing the regional policy for the protection of the Mediterranean Sea against pollution by oil and other hazardous and noxious substances originating from maritime transportation and in particular from shipping incidents. Various Meetings of the Contracting Parties subsequently adopted a series of other documents, recommendations, principles and guidelines that reflected the evolution of this policy, bearing also in mind the changing nature of threats to the marine environment in the Mediterranean, as well as the development of global policies in this field promulgated under the auspices of IMO.

In 1987 the mandate of the Regional Centre was

extended to include “hazardous substances other than oil” and in 1989 to include promotion of regional co-operation for the implementation and enforcement of IMO Conventions for the prevention of pollution of the marine environment by ships.

Taking into consideration the evolution of the Mediterranean context since MAP was founded, as well as the provisions of Agenda 21, the process of revising the entire “Barcelona

system”, including the Mediterranean Action Plan, the Barcelona Convention and its Protocols, started in 1993.

The new Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (**MAP Phase II**) was adopted by the Conference of Plenipotentiaries in Barcelona in June 1995.

The relevant components of MAP Phase II, dealing with **prevention of and response to pollution of the marine environment from sea-based activities**, aimed at proposing strategies and activities that would support and supplement national efforts to promote the prevention of, the preparedness for and response to pollution of the marine environment from sea-based activities.

The objectives of these components were defined as follows:

● **Prevention of pollution of the marine environment from ships**

□ the prevention of pollution of the Mediterranean marine environment from ships by providing incentives and encouragement for the adoption, effective implementation and enforcement of the relevant international conventions; and

□ the establishment, where necessary, of port reception facilities for the collection of liquid and solid wastes generated by ships (oily and chemical residues, sewage and garbage).

● **Preparedness for, response to and co-operation in cases of accidental marine pollution**

□ the development of national, bilateral and/or subregional systems for preparedness for and response to accidental marine pollution;

□ the organization of co-operation among Contracting Parties in preparing for and in responding to accidental marine pollution in case of emergency.

The Barcelona Convention

was also modified by amendments adopted in June 1995.

The amended Convention, renamed “The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean”, is expected to enter into force shortly.

The 1995 Convention takes into account the results of the 1992 Rio Conference and consequently introduces the concept of the sustainable development, precautionary principle, polluter pays principle, promotes environmental impact assessment procedures and integrated management of coastal zones.

New articles address the conservation of biological diversity, pollution from transboundary movements of hazardous wastes and their

The original Barcelona Convention was modified by amendments adopted in June 1995.





Darko Domovic

The new Protocol covers prevention, preparedness and response to marine pollution from sea-based sources.

disposal, environmental legislation, public information and participation.

The adoption by the Tenth Ordinary Meeting of the Contracting Parties (Tunis, November 1997) of the Resolution on the Regional Strategy on prevention of pollution of the marine environment by ship, opened the way for amending the Emergency Protocol.

The revision of the Emergency Protocol aimed at addressing the prevention of marine pollution as indicated in the Regional Strategy, but also at updating its text.

The revision process effectively started in 1998, and comprised *inter alia* three Meetings of National Legal and Technical Experts and an *Ad hoc* Open Ended Meeting of Experts. The Twelfth Ordinary Meeting of the Contracting Parties to

the Barcelona Convention held in Monaco in November 2001 decided that, instead of amending the original Emergency Protocol, a **new** Protocol should be adopted.

The same Meeting approved the new objectives and functions of REMPEC, in order to reflect the modifications made in the text of the Protocol.

The text was finalized and the new Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea was adopted in Malta on 25 January 2002 by a Conference of Plenipotentiaries. The adoption of this new Protocol completed the process of revising the original “Barcelona system”.

The new Protocol now covers prevention, preparedness and response to marine pollution from sea-based sources. Its text was also modernized with a view to harmonizing it with the texts of other relevant international legal instruments, and in particular with the text of OPRC 90 Convention, taking also into account the contribution of the European Community to the implementation of international standards as regards maritime safety and prevention of pollution from ships.

6. REMPEC

In order to assist the coastal States in the implementation of the Emergency Protocol to the Barcelona Convention the Regional Oil Combating Centre for the Mediterranean Sea (ROCC) was established in Malta on 11 December 1976. It was the first such Regional Centre in the world. Operating on the basis of the decisions of the Contracting Parties to the Barcelona Convention, the Centre has been

administered by IMO, and is financed by the Mediterranean Trust Fund. The mandate of the Centre was extended in 1987 to include "hazardous substances other than oil", and in 1989 the Contracting Parties approved the new objectives and functions of the Centre and changed its name to **Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)**.

REMPEC was established in Malta on 11 December 1976.





6.2 Activities

REMPEC's activities, developed with a view to achieving these overall objectives, include: dissemination of information, training, assistance in the development of national and subregional systems for preparedness and response, and facilitating co-operation and mutual assistance among the Contracting Parties, and providing them with assistance in case of emergency.

To provide the coastal States with the information required for preparing and initiating response operations REMPEC has developed and keeps regularly updated the Regional Information System (RIS)

6.1 Objectives

The main **objectives** of REMPEC have been defined as follows:

- To strengthen the capacities of the coastal States in the Mediterranean and to facilitate co-operation among them in case of a major marine pollution incident.
- To assist coastal States of the Mediterranean region, which so request, in the development of their own capabilities for response to incidents.
- To facilitate information exchange, technological co-operation and training.
- To provide a framework for the exchange of information on operational, technical, scientific, legal and financial matters.

Dissemination of information - In order to provide the coastal States with the information required for preparing and initiating response operations, as well as to facilitate mutual assistance, REMPEC has developed and keeps regularly updated the Regional Information System (RIS) that is divided into four Parts, each containing a number of sections:

- A. basic documents;
- B. directories and inventories;
- C. databanks and information services;
- D. operational guides and technical documents.

The Centre endeavours to publish all documents included in RIS in both official languages of the Mediterranean Action Plan, English and French.

In addition to the documents, part of the information included in RIS has been stored in a computerized relational database, developed by REMPEC in 1991 and subsequently modified several times.

The maritime transport oriented database TROCS, containing information on approximately 700 chemical products and 250 crude oils and petroleum products, was developed between 1991 and January 2001, and is available as a CD-ROM. A new database for maritime accidents has been finalized in February 2002.

The Centre's web site (<http://www.rempec.org>) has also been completely redesigned.

Training of personnel from Mediterranean coastal States in dealing with accidental marine pollution has been one of the Centre's priorities since its establishment in 1976.

REMPEC developed, in collaboration with its national Focal Points, a comprehensive training programme that includes courses of both general nature and those dedicated to specific topics. The courses are organized as regional, subregional or

*Since 1980
more than 2000
trainees from all
Mediterranean
coastal States
benefited from
the Centre's
training
programme.*



national and cover both, oil and other hazardous substances, for various levels of pollution response personnel:

- Government administrators and decision-makers;
- On-scene commanders and supervisors;
- Clean-up personnel.

Since 1980 more than 2000 trainees from all Mediterranean coastal States benefited from the Centre's training programme.

In addition, REMPEC regularly provides lecturers to training courses organized in the Mediterranean region by other national or international training institutions.

Assistance in the development of national and subregional systems for preparedness and response - The existence of reliable national systems for preparedness and response, including administrative organization, trained personnel, basic equipment and contingency plans for combating marine pollution incidents, is considered to be the single most important factor which determines the effectiveness and the success of response to such incidents, by public authorities in charge of dealing with them.

Between 1976 and 2001 the number of operational national contingency plans in the region grew from 5 to 11. In addition 2 plans are currently undergoing major revision (Libya, Slovenia) and 5 are under preparation or await approval (Algeria, Israel, Lebanon, Syria, Turkey). REMPEC provided its assistance in setting up or revising national systems to the competent

national authorities of Albania, Algeria, Croatia, Cyprus, Egypt, Israel, Lebanon, Libya, Malta, Morocco, Syria and Tunisia.

REMPEC also assists the coastal States in developing bilateral and multilateral operational agreements between the neighbouring countries and subregional systems for preparedness and response to major marine pollution incidents.

Such agreements presently cover adjacent parts of France, Italy and Monaco (RAMOGE), and South-Eastern Mediterranean (Cyprus, Egypt and

Between 1976 and 2001 the number of operational national contingency plans in the region grew from 5 to 11.



Israel). Development of a similar system for the South-Western Mediterranean countries (Algeria, Morocco and Tunisia) started in 2001. The initial steps have been taken for the development of subregional systems for the Northern Adriatic and Southern Adriatic/Ionian Sea. The initiative for setting up a bilateral system for Italy and Malta has been launched in 2001.

Assistance in case of emergency and facilitating co-operation and mutual assistance - In order to facilitate co-operation and mutual assistance among the Contracting Parties and to provide them with assistance if so requested in case of emergency, REMPEC:

- has developed and keeps up-to-date a regional communications network;
- organizes periodically communication exercises;
- provides technical advice and facilitates and co-ordinates mutual assistance between the countries;
- activates, at the request of the Contracting Parties, the Mediterranean Assistance Unit which provides on the spot advice and technical expertise to the national authorities, in case of emergency.

An “officer-on-duty” on the 24 hours/day basis allows REMPEC to respond promptly to requests for assistance and to mobilize if necessary the Mediterranean Assistance Unit (MAU). MAU is an “expert advice” capability, established by the Contracting Parties, that could be rapidly activated and mobilized by REMPEC in order to provide



assistance in the initial phases of response activities to the competent authorities of a coastal State threatened by a pollution incident. MAU is composed of selected experts in response to accidental pollution by oil and other harmful substances.

Resources for responding to marine pollution incidents available in the region include *inter alia* pollution response equipment and products, specialized vessels and aircraft, auxiliary equipment, and trained personnel, owned, managed or controlled either by the coastal States, or by the industry (oil industry, salvage companies, specialized spill response companies/contractors). Through inventories and directories included in RIS, REMPEC keeps informed competent national authorities on the availability of such resources.

While in 1976 only a few coastal States had a capacity for responding to a marine pollution emergency, at present most coastal States have national stockpiles of response equipment and products, which they can offer, if so requested,

An “officer-on-duty” on the 24 hours/day basis allows REMPEC to respond promptly to requests for assistance and to mobilize if necessary the Mediterranean Assistance Unit (MAU).

REMPEC promoted the establishment in 1997 of the Mediterranean Oil Industry Group (MOIG)



as assistance in case of a major marine pollution incident.

REMPEC promoted the establishment in 1997 of the Mediterranean Oil Industry Group (MOIG), comprising a number of oil companies operating in the Mediterranean region.

MOIG aims at strengthening the co-operation between Governments and the oil industry in the field of oil spill preparedness and response, in line with the OPRC 1990 Convention.

6.3 Main achievements

The main achievements of REMPEC are considered to be:

- Publication of a large number of technical papers, training materials, documents, studies and reports.
- Developing a wide range of recommendations and guidelines related to preparedness and response to accidental marine pollution.
- Development of the Regional Information System (RIS).
- Development of RIS relational database, TROCS database and database on Accidents.
- Training of more than 2000 spill responders, able to deal with pollution incidents, thus significantly increasing the level of expertise available in the Mediterranean region, in various marine pollution related fields.

- Directly assisting 11 Mediterranean coastal States in the development of their national preparedness and response systems, and in the preparation and implementation of their national contingency plans.
- Conducting a number of communication and alert exercises.
- Organizing three major full-scale exercises involving personnel, equipment, vessels, aircraft and other means from several countries.
- Setting up the Mediterranean Assistance Unit (MAU).
- Offering technical assistance in case of emergency to a large number of competent



national authorities of the Mediterranean coastal States.

- Transferring the Mediterranean experience to other Regional Seas.

7. Prospects and Future Challenges

Although much has been done to develop collective capabilities by assisting countries to build strong national institutional bases supported by adequate equipment and human resources, and the situation in developed countries of the Mediterranean region appears adequate to deal with the risk of accidental marine pollution, the capacities of the developing countries will need further strengthening.

Minimizing and eventually eliminating chronic pollution of the Mediterranean Sea through illegal operational discharges from ships is a new challenge facing REMPEC in the forthcoming

period. Although the Mediterranean Sea has been classified as a special area under Annex I to MARPOL 73/78, where no oil discharges are permitted, it is estimated that the main sources of shipping generated oil pollution in the Mediterranean are illegal discharges of oily residues from machinery spaces and from cargo tanks. This type of ship-generated pollution appears less obvious, but it is certain that it is equally or even more damaging for the marine environment than accidental pollution. Adoption of the new Protocol concerning co-operation in preventing pollution from ships and, in case of emergency, combating pollution of the

Eventually eliminating chronic pollution of the Mediterranean Sea through illegal operational discharges from ships is a new challenge facing REMPEC.



Mediterranean Sea gave REMPEC a necessary legal basis to concentrate its efforts on tackling this problem. In accordance with the decisions of the Contracting Parties, REMPEC will play a crucial role in:

- promoting and monitoring effective implementation of the relevant international regulations by the Flag States, Port States and Coastal States;
- developing port reception facilities;
- reducing environmental risks of maritime traffic;
- surveillance of illicit discharges and promoting prosecution of offenders;
- establishing arrangements when necessary for emergency towing.

Protection of the marine environment could only be achieved through what is known as the “safety continuum” encompassing three inter-related phases of prevention, preparedness and response. While the focus of the original Emergency Protocol was on co-operative action for preparedness and response to marine pollution emergencies, the new Protocol will enable REMPEC to also address the prevention of pollution from shipping.

It will also open the possibility for tackling marine pollution problems that have not been dealt with by the Centre so far, including pollution by discharges of sewage and garbage from ships, non-indigenous marine species, and exhaust emissions. By adding cooperation in preventing pollution from ships to the preparedness and

response to marine pollution accidents that had already been addressed in the original Emergency Protocol, the Contracting Parties have closed the loop in the “safety continuum”.

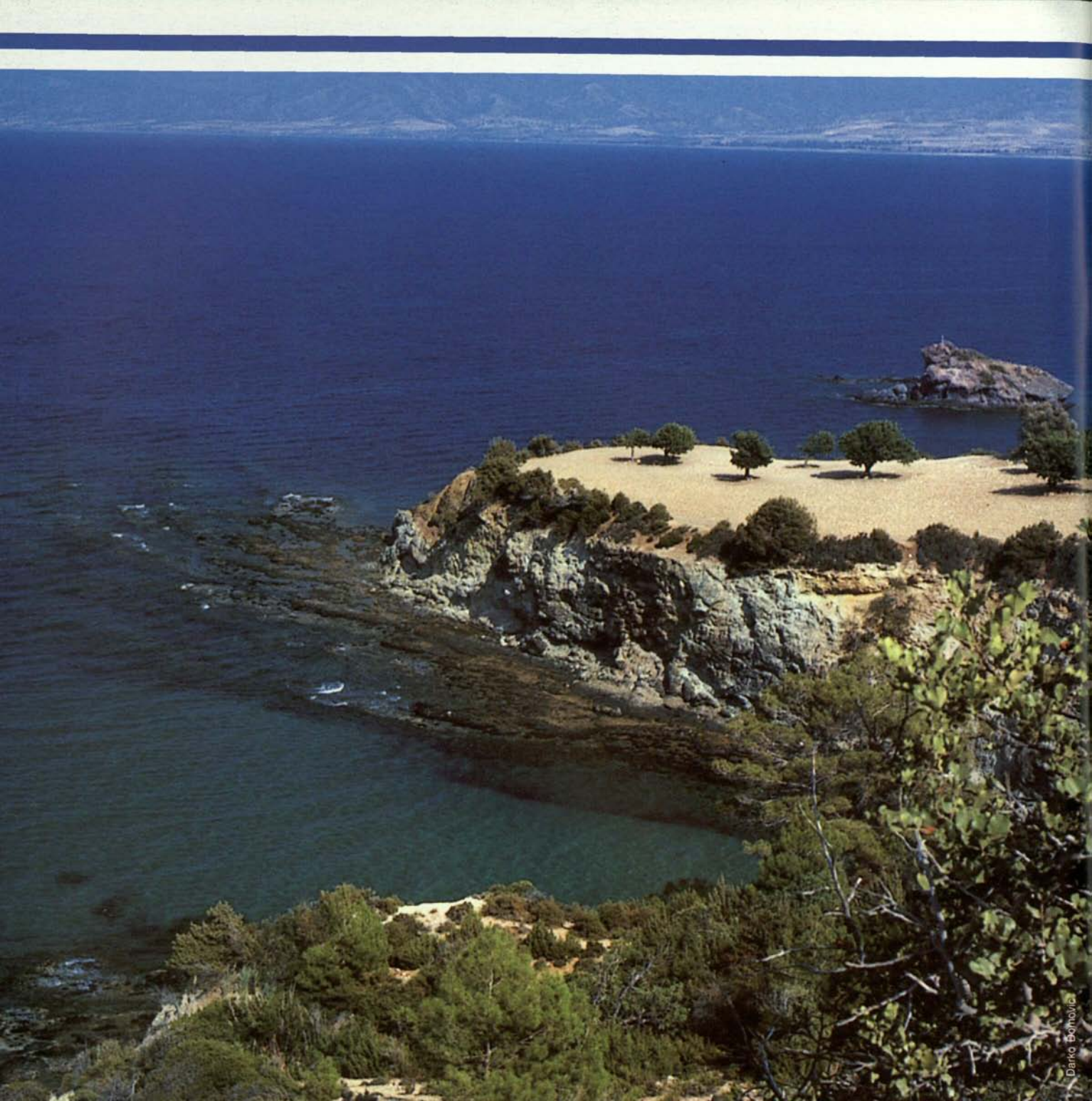
In this undertaking, they have borne in mind that, since shipping is a world-wide activity for which regulations have been adopted at a global level, it was imperative not to develop other legal provisions in addition to those found in the legal instruments of the International Maritime Organization (IMO) and recognized that implementing the international conventions and resolutions adopted under the auspices of IMO

would be the underlying principle of co-operation between coastal States.

Finally, it is expected that the translation of the new Protocol into practical actions will significantly reduce pollution from maritime transport related activities. On the other hand, such efforts involve solving not only technical and financial problems, but also difficulties related to differences in priorities setting in the coastal States due partly to their economic diversities. The success of these efforts will depend on the enhancement of co-operation and the reinforcement of a regional attitude.

It is expected that the translation of the new Protocol into practical actions will significantly reduce pollution from maritime transport related activities.







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