The Role of REMPEC in Prevention of and Response to Pollution from Ships in the Mediterranean Sea

Angela Carpenter, Patrick Donner, and Tafsir Johansson

Abstract With 20% of the global tank ship maritime traffic, and enhanced offshore oil and gas exploration and exploitation activities in the Mediterranean Sea, the risks related to oil pollution, inter alia, from ships are simultaneously increased. Governed by the Contracting Parties of the Barcelona Convention, REMPEC, in turn, assists Mediterranean coastal states in ratifying, implementing and administering conventions and generally accepted international rules and standards implemented by competent international organisations. The intention is ostensibly clear in so far as REMEPEC's mission is to play an important role in mitigating all probabilities and possibilities of pollution from ships. In order to remain in the vanguard of action to prevent and reduce pollution from ships, REMPEC has further committed itself to assisting Contracting Parties of the Barcelona Convention to strengthen preparedness and response capacities through multifarious pragmatic actions, e.g. including remote assistance, on-site assistance, development of contingency planning, development and dissemination of guidelines, training and education and tools. Over the years, there has been a steady increase in the body of general and descriptive literature dedicated to the work of REMPEC. This chapter, however, concentrates on a more specific yet important area. As indicated in the title, this chapter provides an overview of the role of REMPEC pertaining to pollution from ships, with a special focus on oil pollution.

Keywords Barcelona Convention, Marine pollution prevention, Marine pollution response, Mediterranean Sea, Oil pollution, REMPEC

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1 Introduction

> 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 [1].

Pollution from ships was one of the highest priority issues considered when a Mediterranean Action Plan (MAP) [2] was created in February 1975, the first such action plan under the United Nations Environment Programme (UNEP) Regional Seas Programme, established in 1974. Pollution from ships was also a high priority when the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention [3]) and its Protocol Concerning Co-operation in Combatting Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (Emergency Protocol [4]) were adopted by 16 Mediterranean States and the European Community in 1976 [1]. Contracting parties (CPs) to the Barcelona Convention include all 21 Mediterranean coastal states and the European Union.

The high visibility of oil pollution from ships came about as a result of a series of major oil spills in the late 1960s and during the 1970s. In European waters these included the grounding of the *Torrey Canyon* off the Scilly Isles in the UK in 1967, resulting in nearly 120,000 metric tonnes (or 132,277 tons) of oil being spilt; the grounding of the *Jakob Maersk* off Oporto, Portugal, in 1975, resulting in a spill of around 88,000 metric tonnes (97,000 tons) of oil; and the grounding of the *Urquiola* off La Coruña, Spain, in 1976, resulting in a spill of some 73,500 metric tonnes (81,000 tons) of oil.[1] The *Torrey Canyon* spill was highly publicised at the time, with images of attempts to disperse the oil slick (some 25 × 30 miles in size) by using incendiary bombs appearing in newspapers and in the broadcast media [5]. As a result of the *Torrey Canyon* and the publicity surrounding it, two

[1]Source: ITOPF (2014). Available at: http://www.itopf.com/knowledge-resources/data-statistics/gis/ (Last accessed 12 October 2017).

international conventions were adopted in 1969 and 1973; these were the International Convention on Civil Liability for Oil Pollution Damage [6] and the MARPOL Convention [7].

Oil deposits, particularly crude oil and tar balls, are highly visible when they wash ashore, and many deposits could be found on beaches along major shipping lines, including those of the Mediterranean which has a high density of shipping traffic [1]. At the current time, this includes fishing vessels, cruise ships, leisure vessels, military vessels, container ships and tankers and also oil exploration and exploitation "fixed" (i.e. tethered to the seabed) vessels [8]. In the case of oil tankers, these pass from east to west (from the Suez Canal to the Strait of Gibraltar) and from north to the south and back between various refineries and crude oil loading/unloading ports (see Fig. 1; [9]).

Maritime transport has been identified as the main source of petroleum hydrocarbon (oil) and polycyclic aromatic hydrocarbons (PAHs) entering the marine environment of the Mediterranean Sea [10]. Of an estimated 360 million tons of oil and refined products crossing the Mediterranean annually, around 400,000 tons are deliberately dumped every year (2006 figures) [11]. In addition, it was estimated that around 250,000 tons were discharged annually in ports between 1974 and 2006 as a result of deballasting, tank washing, bunkering and discharging bilge oil, for example, with these spills involving small quantities of less than 7 tons [12]. Bilge water containing oil is a particular problem as it is uneconomic to recycle it, unlike waste lubricating oil, and so it is often discharged into the sea, particularly from fishing vessels which have limited space to store waste on board [13].

Accidental spills which generally occur along the main shipping routes and around major oil discharging ports are generally also small in size [10]. The number of large accidental oil spills (over 10 tons) in the region is very small, with only 14 such spills occurring between 1970 and 2015 [8]. The vast majority of spills are

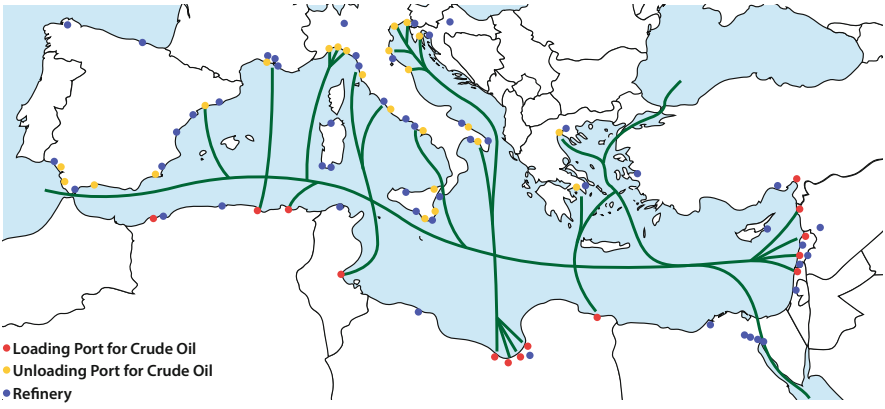

Fig. 1 Oil tanker routes, crude oil loading/unloading ports and refineries in the Mediterranean (Reproduced from One-Europe.net [9])

far smaller in scale and are located along the main shipping routes and around the major oil discharge ports [10].

Between 1977 and 2000, there were 311 reported incidents that caused (or were likely to cause) oil pollution in the Mediterranean Sea [1]. Of these, 156 caused oil pollution and 155 did not cause an oil spill, although incidents likely to cause a spill were not reported [1].

While oil spills can also come from a range of other sources including industrial activities or coastal harbours [10] and from the various refineries, petrochemical installations and oil and gas pipelines located around the region [8], it is the issue of discharges from ships at sea, regulated under the MARPOL Convention [8] and its 1978 amendments [14], that is the main focus of this chapter. The role of REMPEC in contributing to the prevention and reduction of pollution from ships, and in combatting pollution in the event of an emergency, is examined in detail.

2 REMPEC and Its Mandate

The Regional Oil Combatting Centre (ROCC) was established on 11 December 1976 in Malta and was administered by the International Maritime Organization (IMO) and financed by the Mediterranean Trust Fund [1]. The Centre was established in order to strengthen the capabilities of Mediterranean coastal states and facilitate cooperation in combatting oil pollution and dealing with marine pollution emergencies [15]. The ROCC subsequently became REMPEC (the Regional Marine Pollution Emergency Response Centre for the Mediterranean Region) in 1989. REMPEC is based in Valetta, Malta, and is administered by the IMO in cooperation with UNEP/MAP [15].

The mandate of REMPEC has expanded over time to address global developments relating to prevention of pollution from ships and to meet changes in the 1976 Emergency Protocol [4] which subsequently became the *Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combatting Pollution of the Mediterranean Sea* (Prevention and Emergency Protocol 2002) [16].

In addition, a regional strategy – the *Regional Strategy for Prevention of and Response to Marine Pollution from Ships* [17] – was approved by the contracting parties (CPs) in 2005 as a 10-year roadmap for implementation of the Prevention and Emergency Protocol and, since 2006, most of the activities of REMPEC are intended to implement the regional strategy. More recently, the latest regional strategy for the period 2016–2021 [18] also takes into account sustainable development goals in line with the Mediterranean strategy for sustainable development 2016–2021 [19]. In the case of both the Prevention and Emergency and the Offshore Protocols, not all Mediterranean states are CPs. Albania, Bosnia and Herzegovina and Lebanon have neither signed nor ratified the Prevention and Emergency Protocol although all three ratified the 1976 Emergency Protocol; only Albania, Cyprus, the EU, Libya, Morocco, Syria and Tunisia have adopted the Offshore Protocol, while Croatia, Greece, Israel, Italy, Malta, Monaco, Slovenia

and Spain have signed but not ratified that Protocol (see [20] for status of ratifications).

REMPEC was the first of seven Regional Activity Centres in the Mediterranean and was established (as the ROCC) under the original Mediterranean Action Plan of 1976. The MAP was subsequently revised, and the new version – the *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 1995 [21]. The other Regional Activity Centres are the Mediterranean Pollution Assessment and Control Programme (MED POL), the Plan Bleu Regional Activity Centre (PB/RAC), the Priority Actions Programme Regional Activity Centre (PAP/RAC), the Specially Protected Areas Regional Activity Centre (SPA/RAC), the Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC) and the Regional Activity Centre for Information and Communication (INFO/RAC) (see [22, 23] for further details).

REMPEC has, over its 40-year history (to 2016), made a number of contributions to the Mediterranean Region [24]. These include but are not limited to:

- Providing 15 CPs with assistance in drafting, reviewing and adopting National Marine Pollution Contingency Plans. Those CPs are Albania, Algeria, Croatia, Cyprus, Egypt, Israel, Lebanon, Libya, Malta, Montenegro, Morocco, Slovenia, the Syrian Arab Republic, Tunisia and Turkey. These CPs, together with France and Greece, also have national preparedness and response systems in place, including operational national contingency plans [24].
- Assisting groups of countries to draft and adopt subregional agreements on preparedness and response to spills. Examples of subregional agreements include agreements between Cyprus, Israel and Egypt; between Algeria, Morocco and Tunisia; and between Croatia, Italy and Slovenia [24].
- Assisting countries in emergency situations. In this respect the REMPEC has in place a 24/7 Centre to assist CPs in the case of an emergency and also in areas such as wildlife restoration and pollution drift forecasting [24].
- Compilation of an inventory of port reception facilities in coastal states that are not member states of the EU. In the area of garbage from ships, this assisted in the granting of special status for the Mediterranean under Annex V (Garbage) of the MARPOL Convention [14] and resulted in stricter rules for garbage disposal at sea in the region.
- In the area of illicit discharges from ships, with the recognition that these were taking place on a daily basis despite the Mediterranean Sea also holding special area status under MARPOL Annex I (oily wastes), REMPEC has assisted CPs to the Barcelona Convention in strengthening national legislation on the enforcement of MARPOL, while a Mediterranean Network of Law Enforcement Officials relating to MARPOL (MENELAS) was established in 2013 [24].

REMPEC's main fields of action centre around the prevention of pollution of the marine environment from ships and the development of preparedness for and response to accidental marine pollution and cooperation in case of emergency. These actions are discussed in more detail in Sects. 3 and 4.

3 The Role of REMPEC in Pollution Prevention

REMPEC has a number of roles in relation to pollution prevention in the Mediterranean region, and these are discussed below and are set within the main fields for action of REMPEC [15]. These aspects are among the implementation goals of the 2016 Regional Strategy (see [18], Appendix 1) and include ratification of relevant international maritime conventions related to the protection of the marine environment; ensuring effective maritime administrations; provision of reception facilities in ports; monitoring of delivery of ship-generated wastes, improved follow-up of pollution events as well as monitoring and surveillance of illicit discharges; improving the level of enforcement and prosecution of discharge offenders; the reduction of pollution generated by pleasure craft activities; and establishing procedures for designation of places of refuge to minimise the risk of widespread pollution.

3.1 Effective Maritime Administration Activities

The activities of REMPEC include working with national authorities of coastal states (CSs) to promote ratification of relevant maritime conventions such as international conventions dealing with maritime safety and prevention of pollution from ships (including MARPOL [14]), dealing with combating pollution and dealing with liability and compensation for pollution damage ([25], see also [17]). It also includes a wide range of EU regulations and directives ([25], see also [17]).

In addition, REMPEC assists national authorities to ensure that their maritime administrations in charge of implementation and enforcement of the very wide range of conventions have the knowledge necessary to do so. This activity is in line with one of the main fields for action of REMPEC, i.e. strengthening the capacities of CSs in the region to ensure effective implementation of international measures to abate, combat or eliminate pollution of the marine environment from shipping activities [15].

In order to achieve this, REMPEC provides a range of training courses as well as access to technical and legal expertise [26]. This is also in line with one of the main fields for action of REMPEC, i.e. providing a framework for exchange of information on operational, technical, scientific, legal and financial matters between CSs, in order to achieve coordinated action for implementation of the Prevention and Emergency Protocol [15].

3.2 *Activities Dealing with Illicit Discharges of Oil and Other Hazardous or Noxious Substances*

Another area where REMPEC has worked since the adoption of the Prevention and Emergency Protocol in 2002 is in setting up marine pollution monitoring and surveillance systems in response to continuing illicit discharges in the region. REMPEC has been involved in a range of activities relating to marine pollution surveillance and monitoring including providing coastal states with technical knowledge on remote sensing systems, participating in pilot projects on satellite monitoring and assisting CSs to establish national monitoring and surveillance systems [26]. These activities are in line with the field of action relating to regional cooperation in preventing pollution from ships and dealing with pollution when oil or other hazardous and noxious substances have been (or may be) discharged at sea and also where a spill requires emergency action or some other immediate response [15].

The requirement for REMPEC to carry out pilot projects was set out in Sect. 4.7 of the Regional Strategy [17] which highlighted a lack of monitoring and surveillance in Mediterranean waters necessary to achieve effective implementation of MARPOL. Only a small number of CSs were already conducting aerial surveillance of their waters (para. 4.7.1). It was recognised that a regular system of national aerial surveillance was necessary if the 2002 Prevention and Emergency Protocol was to be effective (para. 4.7.2). In order to do so, there was a requirement for an enhanced system for satellite surveillance (para. 4.7.3) which would be in addition to the *CleanSeaNet* (CSN) services provided by the European Maritime Safety Agency (EMSA) (see [27] for further details). CSN data was available to all EU Member States, together with beneficiary countries from the Project EuroMed Cooperation on Maritime Safety and Prevention of Pollution from Ships III (Safemed III[2]) and also to REMPEC.

Two projects identified in the Regional Strategy (para. 4.7.4) as being implemented by REMPEC – AESOP and MARCOAST:

– AESOP[3] – the Aerial and Satellite Surveillance of Operational Pollution in the Adriatic Sea Project was carried out between 2005 and 2006 with the aim of testing the reliability and validity of satellite observations compared to those from specially equipped aircraft [26]

[2]Safemed III beneficiary countries included Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, the Palestinian Authority, and Tunisia. For further details of Safemed III, see: http://emsa.europa.eu/safemed.html (Last accessed 16 October 2017).

[3]For further information on the AESOP Project, see http://rempec.org/admin/store/wyswigImg/file/Information%20resources/Other%20Meetings-Activities/Illicit%20discharges/Technical%20reports/AESOP%20report%20-%20April%202007%20(E).pdf (Last accessed 16 October 2017).

– MARCOAST[4] – the Marine & Coastal Environmental Information Services (European Space Agency funded) Project for Algeria, Morocco and Tunisia was carried out between September 2007 and January 2009 to provide operational satellite monitoring to Southern Mediterranean countries. Each country received data specific to its own waters, but the data was also shared between neighbouring countries so that subregional monitoring and cooperation could occur in the event of an oil spill detected close to the border between two CSs [26].

In relation to aerial surveillance, a number of Western Mediterranean countries also cooperated in the OSCAR-MED operation in 2009.[5] Surveillance aircraft from France, Italy and Spain flew out from the French airport at Hyères during the last week of September 2009. Outcomes of that operation included the detection of three oil spills by satellite (subsequently identified and confirmed by surveillance aircraft), and three ships were caught illegally discharging, including two discharging mineral oil in the French Ecological Protected Zone [26]. Subsequent OSCAR-MED activities took place in 2013 with aircraft from Algeria, France, Italy, Morocco and Spain participating in this aerial surveillance operation in the Western Mediterranean in June 2013. During this operation, 700 vessels were monitored, and three oil slicks were detected, and CSN satellite images were provided by EMSA [26].

Also in the area of illicit discharges, REMPEC has assisted Mediterranean countries to establish appropriate legal frameworks for transposing MARPOL Annex I covering oily wastes into national legislation and has also worked towards promoting a network of prosecutors across the Mediterranean region to facilitate judicial cooperation and potentially establish common procedures for prosecution of polluters [26]. For example, a Regional Seminar on Illicit Discharges from Ships and Prosecution of Offenders was held in France in November 2007 [28] and dealt specifically with legal issues relating to such illicit discharges.

3.3 Activities Dealing with Port Reception Facilities

As noted in Sect. 2, REMPEC has been involved in the compilation of an inventory of port reception facilities in CSs that are not member states of the EU. For example, a 2-year project (the MEDA Project[6]) took place between January 2002

[4]For further information on the MARCOAST Project, see http://www.rempec.org/admin/store/wyswigImg/file/Information%20resources/Other%20Meetings-Activities/Illicit%20discharges/Exercices/OSCAR-MED%20(EN).pdf (Last accessed 16 October 2017).

[5]For further information on OSCAR-MED 2009, see http://www.rempec.org/admin/store/wyswigImg/file/Information%20resources/Other%20Meetings-Activities/Illicit%20discharges/Exercices/OSCAR-MED%20(EN).pdf (Last accessed 16 October 2017).

[6]For further information Activity C of the MEDA Project on Collection and Treatment of Oily Ballast Water from Tankers, see http://rempec.org/admin/store/wyswigImg/file/Information%20resources/

and December 2004 to identify the existing situation and needs for port reception facilities in ports and oil terminals with regard to ship-generated garbage, bilge waters and oily wastes [29]. Ten CSs participated in this project – Algeria, Cyprus, Egypt, Israel, Lebanon, Malta, Morocco, Syria, Tunisia and Turkey. Cyprus and Malta joined the EU on 1 May 2004, and so at the commencement of the project they were not EU member states.

This project found that while a number of ports and terminals did not have facilities to collect and treat oily wastes, almost all ports did have adequate facilities for receiving garbage from ships [29]. As a result, recommendations were provided on optimum solutions for collection, treatment and disposal of solid and liquid ship-generated wastes and standard designs were also proposed for such facilities [29].

3.4 Guidelines for Pleasure Craft and for Places of Refuge

More recent work in the area of prevention includes *Guidelines concerning Pleasure Craft Activities and the Protection of the Marine Environment* [30] and *Guidelines on the decision-making process for granting access to a place of refuge for ships in need of assistance* [31], both adopted by a meeting of CPs in January 2008. The guidelines on pleasure craft activities were developed in response to serious concerns about the potential harm that the increasing density of boats and yachts may cause to the Mediterranean environment [30].

In the case of the places of refuge, this is particularly important in providing sheltered areas where assistance can be provided in the event of, for example, a fire on board a vessel, or where cargo has shifted on board, or where there has been a pollution event ([31], para. 13). The guidelines on places of refuge are in line with Article 16, Reception of Ships in Distress in Ports and Places of Refuge of the Prevention and Emergency Protocol [16], and are an important element in minimising the risk of widespread pollution from ships in need of assistance [31].

4 The Role of REMPEC in Marine Pollution Response and Preparedness

REMPEC has a number of roles in relation to marine pollution response and preparedness in the Mediterranean region [32], and these are discussed below. In terms of the main fields for action of REMPEC [15], these activities relate mainly to assisting CSs in the development of their own national capabilities for pollution response and assisting CSs, in the event of an emergency, if they require direct

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Other%20Meetings-Activities/Port%20reception%20facilities/Technical%20Reports/Activity%20C%20-%20Final%20Report%20Consolidated.pdf (Last accessed 16 October 2017).

assistance or assistance from other parties. If such assistance does not exist within the Mediterranean region, REMPEC should help CSs obtain international assistance from outside the region.

In respect of the implementation goals of the 2016 Regional Strategy (see [18], Appendix 1), those with relevance to REMPEC's role in marine pollution response are ensuring that adequate emergency towing capacity is available throughout the Mediterranean to assist vessels (including tankers) in distress; enhancing levels of prepositioned spill response equipment under the direct control of Mediterranean CSs; improving the quality, speed and effectiveness of decision-making processes in case of marine pollution incidents (development and introduction of technical and decision support tools); increasing the level of knowledge in the field of preparedness and response to accidental marine pollution by oil and other harmful substances; revising existing recommendations, principles and guidelines and developing new ones to facilitate international cooperation and mutual assistance within the framework of the 2002 Prevention and Emergency Protocol; and strengthening the capacity of individual CSs to respond efficiently to marine pollution incidents through development of subregional operational agreements and contingency plans.

4.1 Response Activities of REMPEC

Article 12 of the Prevention and Emergency Protocol [16] identified that any party requiring assistance to deal with a pollution incident may call on other parties – directly or through REMPEC – starting with those parties that are most likely to be affected by such pollution. In respect of this Article, assistance can include expert advice or those other parties making available specialised personnel, products, equipment, etc. to help deal with that pollution. Where there is disagreement between CPs on the organisation of such an operation, REMPEC may coordinate these activities, as long as all the parties agree [32]. Article 12 also requires that each party shall take the necessary legal and administrative measures to facilitate the arrival, use and departure from its territory of ships, aircraft and other transport that has been used, for example, in responding to the pollution incident or transported personnel, cargoes, materials and equipment, for example [16].

Any CP can request assistance from REMPEC in the event of marine pollution occurring and can do so via the 24/7 Centre mentioned previously. They can also report such an incident using the pollution reporting system (POLREP), a standard alert message recommended by the IMO, which is divided into three parts (see [33] – POLREP form available to download). Part I – Pollution warning (POLWARN) provides initial information or a warning of pollution or the threat of pollution including the data and time and position of an incident. Part II – Pollution information (POLINF) gives detailed supplementary reports and situation reports including characteristics of pollution, its source and cause, wind direction and speed, current or tide, sea state and visibility and drift of pollution, for example. Part III – Pollution facilities

(POLFAC) is used to request assistance from other CPs and to define operational matters relating to that assistance and includes information on cost of such assistance, prearrangements for its delivery, where and how it is to be delivered and the other states from which assistance has been requested [33]. Where appropriate assistance cannot be found within the Mediterranean region, REMPEC is able to obtain assistance from outside the region [32].

4.1.1 Remote Assistance

REMPEC can provide remote assistance, such as providing information and advice by telephone, communicating on behalf of the state(s) involved in a pollution incident, advising on other sources of information if it is not available from REMPEC and also coordinating regional assistance [32]. As a function of REMPEC, it is required to develop and maintain working relationships with the other Regional Activity Centres of the MAP and with scientific institutions within the region [34]. Under Specific Objective 18 for REMPEC under the Regional Strategy for 2016–2021 [18], REMPEC is required to encourage participation of regional and technical institutions in R&D activities and to facilitate the transfer of technology. In order to do so, REMPEC assists regional institutions and industry in identifying fields of research requiring enhancement of oil spill preparedness and response technologies and techniques, for example, and also assists in dissemination and exchange of results of national R&D activities.

Specific Objective 19 for REMPEC under the Regional Strategy 2016–2021 [18] requires improvement of the quality, speed and effectiveness of decision-making processes in case of marine pollution incidents through the development and introduction of technical and decision support tools, and in this respect, REMPEC cooperates with scientific institutions and industry in the region and has developed specific cooperation agreements [32].

One agreement which entered into force in 2009 was developed between REMPEC and the Mediterranean Operational Network for the Global Ocean Observing System (MONGOOS) under which a virtual MONGOOS Emergency Response Office (ERO) was established to coordinate, evaluate and disseminate information on behalf of MONGOOS members [34]. REMPEC is able to request information from the ERO on meteo-oceanographic data and oil spill simulations to predict the movement of oil at sea and identify areas most likely to be impacted by accidental spills of oil, for example, which can be used to assist in providing information and advice to CPs [34].

Another area where REMPEC cooperates with expert bodies is that of hazardous and noxious substances (HNS). The European Chemical Industry Council (CEFIC) provides assistance in the event of land-based chemical spills through the International Chemical Environment (ICE) network. In the event of HNS spills occurring in the marine environment, REMPEC acts as a liaison Centre between ICE and affected CSs to communicate information on the chemicals involved in an incident and the risks they pose, for example [34].

Finally, in the area of remote assistance, REMPEC works with the Sea Alarm Foundation, a non-profit non-governmental organisation based in Brussels, Belgium, to enhance the capacities of CSs to respond to oiled wildlife incidents [34], and the Foundation also provides on-site assistance, discussed below.

4.1.2 On-Site Assistance

REMPEC is also able to provide on-site assistance, with REMPEC officers or representatives of the Mediterranean Assistance Unit (MAU) providing advice at the site of an accident [32]. The MAU was established in 1993 and offers an expert advice capability when mobilised by REMPEC at the request of a CP in an emergency situation.

The MAU is based on five memoranda of understanding between REMPEC and relevant institutions [35]. Four of those institutions are able to provide on-site assistance: CEDRE (Centre de Documentation, de Recherche et d'Expérimentations sur les pollutions accidentelles des eaux/Centre of Documentation, Research and Experimentation on Accidental Water Pollution), based in Brest, France; FEDERCHIMICA (Federazione Nazionale dell'Industria Chimica/Italian Federation of the Chemical Industry) based in Milan, Italy; ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale/the Italian National Institute for Environmental Protection and Research) based in Rome, Italy; and the Sea Alarm Foundation which provides assistance and advice during responses in regard to oiled wildlife incidents.

An example of a request for assistance from the MAU took place in September 2017. Assistance was requested by Greece following the sinking of the oil tanker *Agia Zoni II* off Piraeus on 10 September 2017, following which two MAU experts were mobilised to the accident to provide technical support on sunken oil assessment and removal techniques and on efficient oil removal from sandy beaches [36]. In this case CEDRE and ISPRA provided on-site assistance in dealing with the impacts of this accident.

4.2 Preparedness Activities of REMPEC

One of the most important activities of REMPEC has been to provide assistance to individual CPs in the event of marine pollution incidents. Reliable national systems for preparedness and response are therefore seen as the single most important factor in determining the effectiveness and success of response to such incidents. In the area of response, there are five specific activities of REMPEC: contingency planning, Mediterranean overview, capacity building, government and industry cooperation and guidelines and tools.

4.2.1 Contingency Planning

One aspect of such preparedness is through contingency planning at both national and subregional levels [37]. In this regard, REMPEC provides assistance to competent national authorities to develop National Systems for preparedness and response to marine pollution, which also includes contingency planning. Seventeen Mediterranean CSs have national preparedness and response systems including operational national contingency plans (NCPs). These CSs are Albania, Algeria, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria, Tunisia and Turkey. Bosnia and Herzegovina and Lebanon do not have an NCP, while Libya has an NCP under preparation, and Lebanon and Malta have drafted NCPs, but they have not yet (October 2016) been approved [37].

In addition to National Systems and NCPs, there are also a number of subregional systems for preparedness and for response to marine pollution, including contingency planning. These are the results of bilateral or multilateral operational agreements between neighbouring countries, and their development is part of the mandate of REMPEC. These agreements offer mutual assistance in the case of marine pollution events and allow individual CPs to pool resources and conduct joint operations [37]. There are four such subregional systems:

- The RAMOGE Agreement[7] covering parts of France, Italy and Monaco was signed in 1976. In 1993 the RAMOGEPOL Plan[8] was developed to define operational aspects of joint spill response between the three countries and was subsequently updated in 2005.
- Subregional contingency plan for the southeastern Mediterranean – this plan, which covers Cyprus, Egypt and Israel, has yet to enter into force although some activities have taken place within the framework of this agreement.
- Subregional contingency plan for the south-western Mediterranean – this plan includes Algeria, Morocco and Tunisia. It was signed in June 2005 and entered into force in May 2011.
- Subregional operational agreement and contingency plan for the Adriatic – this plan includes Croatia, Italy and Slovenia and was signed in November 2005 but has not yet entered into force.

4.2.2 Mediterranean Overview

In the case of Mediterranean overview, REMPEC and the Mediterranean Oil Industry Group (MOIG) initiated an assessment exercise to evaluate the level of capacity to respond to a pollution incident across the region. This work commenced

[7]Accord relative a la Protection de l'Environnement Marin et Cotier d'une Zone de la Mer Mediterranee. Available at http://www.ramoge.org/documents/accord.pdf.

[8]Summary of the Plan RAMOGEPOL. Available at http://www.ramoge.org/documents/ramogepol.pdf.

in 2008 and provides regional information on national competent authorities contact list, the status of ratification of relevant conventions and protocols, contingency planning at national and subregional levels and a list of companies offering services in the Mediterranean Sea region [38]. Individual Country Profiles are available via a link from the REMPEC Country Profile page.[9] A synoptic overview of REMPEC related to government and industry cooperation is provided in Sect. 4.2.6 of this chapter.

4.2.3 Capacity Building

Capacity building is required to ensure a prompt and efficient response to an incident, and training and practice form an essential component of such capacity building. At an international level, the IMO has developed a range of training courses in line with Article 6 of the *International Convention on Oil Pollution Preparedness, Response and Cooperation* (OPRC, 1990) [39]. The IMO delivers a range of courses at various levels – from introductory to Level 3 – in relation to responses to oil spills and more recently has developed courses relating to responses to HNS spills [40].

At the regional level, REMPEC has also developed a training programme in line with Article 4 of the Prevention and Emergency Protocol [16] under which parties shall endeavour to maintain and promote a contingency plan, which includes preparation of personnel to deal with emergencies [40]. The REMPEC training programme commenced in the early 1980s and specialised training courses are organised by REMPEC in areas such as characteristics of oil and HNS spills, contingency planning, forecasting modelling, use of dispersants, oiled shoreline assessment and waste management [40].

From 2006 to 2012, the EU-funded SAFEMED II and II projects, which were implemented through REMPEC, provided numerous training opportunities for, among others, vessel traffic systems operators as well as sponsored fellowships for postgraduate studies at the International Maritime Law Institute in Msida, Malta, and the World Maritime University in Malmö, Sweden [41]. These measures are seen to significantly build the capacity of the maritime administrations of the CPs both in the short and longer term.

[9]Country Profile data is available from the website of the International Tanker Owners Pollution Federation Limited (ITOPF) a not-for-profit organisation established on behalf of the world's shipowners to promote an effective response to marine spills of oil, chemicals and other hazardous substances. Available at: http://www.itopf.com/knowledge-resources/countries-regions/.

4.2.4 Guidelines and Tools

The establishment of the Mediterranean Technical Working Group (MTWG) was considered an important item by the Meetings of REMPEC's Focal Points in 2000 [42]. The objective of the establishment of the MTWG was to facilitate the "exchange of technical data and other scientific information" concerning preparedness and response matters pertaining to marine pollution emergencies [42]. It was also determined that the method of work of the MTWG should concur with the purpose of the Guidelines for the Mediterranean Technical Working group:

1. The purpose of establishing the Mediterranean Technical Working Group (MTWG) is to facilitate the consideration of an issue or specific item by the meetings of REMPEC's focal points on the basis of a consolidated report prepared by the Secretariat of the MTWG through consultation by correspondence with interested delegations, international organisations and appropriate entities.
2. The MTWG is also a regional forum through which the contracting parties can contribute to the relevant work carried out at a global level (e.g. IMO OPRC-HNS technical group) [43].

Following the aforementioned development, REMPEC advanced a set of guidelines, decision support tools and a database with a view to providing a broad range of options to the decision-makers of contingency plans [42].

The guidelines also titled "Legal Framework of REMPEC", as delineated in the official home of REMPEC, is a combination of the following:

1. *Protocols*: (a) Protocol Concerning Cooperation in Combatting Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in the Case of Emergency and (b) the amendment adopted in 2002 – Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea [16][10]
2. *REMPEC*: (a) Resolution 7 and Annex on the Establishment of a Regional Oil-Combating Centre for the Mediterranean Sea (Barcelona, 16 February 1976), (b) Revised Annex related to the Objectives and Functions of a Regional Centre for Combating Pollution of the Mediterranean by Oil and Other Harmful Substances (Athens, 6 October 1989), (c) Objectives and Functions of a Regional Centre for the Implementation of the Emergency Protocol (Monaco, 14–17 November 2001) and (d) Mandate of the Components of MAP including the Mandate of REMPEC (Marrakesh, 5 November 2009)[11]

[10]Discussed in Sect. 4.2 of the Chapter: Carpenter and Johansson [23].

[11]Discussed in Sects. 3 and 4 of this chapter.

3. *Consolidated version*: Regional Information System (RIS) Part A. Basic Documents, Recommendations, Principles and Guidelines concerning Accidental Pollution Preparedness, Response and Mutual Assistance, as well as Prevention of Pollution from Ships, 2008 [42]

It is important to note that the "consolidated version" contains, inter alia, Recommendations Concerning Sea-based Pollution Prevention and Control and Recommendations Concerning Marine Pollution Prevention and Control aimed at providing guidance to contracting parties on the subject matter of pollution. The aforementioned recommendations are general in nature and are deemed to cover oil pollution prevention and control [44].

Other than the guidelines, REMPEC has developed a number of operational tools available to the contracting member states, which could be used to obtain insights when developing strategies and plans to prevent, abate, combat and eliminate potential and actual threats from oil pollution. To that end, an overview of the operational tools relevant to oil pollution is provided in the following:

1. **Alerts and Accidents Database (Additional Tools)**

Introduction Document

Includes "Accident involving any type of ship, which actually resulted in an oil spill, a spill or release of a hazardous and noxious substance, or in a loss or damage to a container containing HNS; . . . Accident involving one or more oil tankers or chemical tankers (either laden or not); . . . All accidents involving sinking of vessels that had on board any quantity of oil as bunkers". [45];

Statistical Analysis

This document provides an overview of incidents causing or likely to cause pollution by oil and is based on incidents that occurred between 1977 and 2010. The overview contains:

1. Quantities of oil spilled and number of accidents
2. Places of accidents with a release above 100 tonnes
3. Types of accidents for released quantities $<$700 tonnes and $>$100 tonnes
4. Age of vessel [46]

Note that the Statistical Analysis is accompanied by a separate document titled "User's guidelines" [47].

2. **MIDSIS TROCS**

Only deals with HNS tools and chemical data, to the exclusion of oil.

3. **Med GIS on Maritime Traffic**

Med GIS on maritime traffic is "[i]n line with Specific Objective 9 of the Regional Strategy for Prevention of and Response to Marine Pollution from Ships, which aims at reducing the risk of collisions by inter alia *identifying the main shipping lanes for vessels carrying oil* and other hazardous and noxious substances in the Mediterranean Sea, and within the framework of the EU-funded

Safemed Project, REMPEC commissioned Lloyd's Marine Intelligence Unit (Lloyd's MIU) to prepare a Study on Maritime Traffic Flows in the Mediterranean Sea ... [emphasis added]" [48].

4. **Waste Management Decision Support Tool**

> The Tool focuses on oil spill waste, i.e. oil, weathered and/or emulsified oil, oiled material, oiled sediment, oiled equipment, etc. recovered after an accidental oil spill.
>
> The Tool is designed to assist any country of the Mediterranean Sea to develop a complete and operational "Oil Spill Waste Management Plan - OSWMP" covering:
>
> – Preparedness: developing an oil spill waste management plan.
> – Response: choosing the best oil spill waste treatment. [49]

5. **MEDGIS-MAR**

The MEDGIS-MAR platform includes "public data", and "national data including Response Means, Marine Accidents, *Oil Handling Facilities*, and *Oil and Gas Offshore Installations*, provided by the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean Sea (Barcelona Convention) through the Mediterranean Technical Working Group (MTWG), the Centre de documentation, de recherche et d'expérimentations sur les pollutions accidentelles des eaux (Cedre), the *International Tanker Owners Pollution Federation* (ITOPF) and the *Mediterranean Oil Industry Group* (MOIG) and whose access is currently restricted to the Mediterranean coastal States ... [emphasis added]" [50].

4.2.5 Involvement of REMPEC in MEDESS-4MS and POSOW

In 2012, REMPEC was involved in a 3-year partnership project titled Mediterranean Decision Support System for Marine Safety (MEDESS-4MS) with 19 partners from 7 countries [51]. With the Department of Merchant Shipping of Cyprus as the main coordinator, the project partners were "dedicated to the strengthening of maritime safety by mitigating the risks and impacts associated to oil spills and aimed at offering a comprehensive and integrated oil spill forecasting multi-model approach" by considering meteorological and oceanographic data, data related to ship traffic, ship operations and sensitivity mapping [51]. It is noteworthy that the development of the MEDGIS-MAR decision support system was overviewed by REMPEC within the framework of Work Package 4 of the MEDESS-4MS [51].

In the following year, REMPEC coordinated the project titled Preparedness for Oil-Polluted Shoreline Cleanup and Oiled Wildlife Interventions Project (POSOW I) that was initiated to support the Mediterranean regional cooperation alliance in the area of marine pollution [52]. Four manuals were produced within the framework of POSCOW I that address aspects related to oil spill volunteers, oiled shoreline cleanup, oiled wildlife response and oiled shorelined assessment [53].

The Preparedness for Oil-polluted Shoreline cleanup and Oiled Wildlife interventions Project (POSOW II) commenced on 1 January 2015 and is a follow-up of POSOW I [52, 54]. Funded by the European Commission's Humanitarian Aid and Civil Protection department (DG ECHO), POSOW II is partnered by REMPEC, Istituto Superiore per la Protezionee la Ricerca Ambientale (Italy), Instituto Portuario de Estudios y Cooperacion de la Comunidad Valenciana (Spain), Arab Academy for Science, Technology and Maritime Transport (Egypt), and General Directorate of Maritime and Inland Waters (Turkey) [55]. The Centre of Documentation, Research and Experimentation on Accidental Water Pollution (Cedre) was responsible for overall coordination [55].

During the first year (2015) of POSOW II, the partners focused on two main themes, i.e. the preparation of training materials and the translation of materials produced as part of POSOW I and POSOW II into Arabic and Turkish [54]. Subsequently, in the second year (2016), the focus of the project was on (a) the organisation of two theories and practical "train the trainer" courses at Cedre, (b) the organisation of national training courses in the seven South Mediterranean countries (Algeria, Egypt, Lebanon, Libya, Morocco, Tunisia and Turkey) and (c) the updating of the database of people trained through the projects POSOW I and II [56]. In terms of "train the trainer" course, it is estimated that 34 participants from the aforementioned South Mediterranean countries received training on (a) volunteer management, (b) oiled shoreline assessment, (c) oiled shoreline cleanup, (d) oiled wildlife response, (e) waste management and (f) fishermen's support in oil spill response [57].

4.2.6 Government and Industry Cooperation

REMPEC plays an important role in the context of government and industry cooperation whereby a noteworthy example is the supervisory role played by the Director of REMPEC [58]. Under the supervision of the Director of REMPEC together with the support of the OPRC Programme Officer, the Volontaires Internationaux Scientifiques (VIS) acts as a liaison officer between REMPEC and the Mediterranean Oil Industry (MOIG) [58]. An important objective of the VIS is to provide assistance and cooperation to REMPEC in its endeavours related to preparedness and response to marine pollution. It is also important to stress that the VIS Programme is established under the French Ministry of Foreign Affairs with a view to supporting and endorsing the cooperation between governments and industry in the Mediterranean.

In 2008, REMPEC and MOIG in cooperation with the International Petroleum Industry Environmental Conservation Association (IPIECA) initiated an assessment exercise [58]. The objective of the assessment exercise was to obtain a national and regional overview of the *status quo* oil pollution preparedness and response from a Mediterranean government and industry perspective [58]. This assessment exercise served as a basis for the conclusions and recommendations drawn in the 2009 Regional Government and Industry Workshop on Co-operation,

Preparedness for and Response to Oil Spills in the Mediterranean Sea. The conclusions and recommendations enabled REMPEC and MOIG to prepare "a short, medium and long term joint programme of work" highlighting the grey areas in order to augment and strengthen overall regional cooperation with regard to preparedness and response capacity in the Mediterranean [58]. Some of the important information, as incorporated in the official home of REMPEC, regarding the national and regional overview are provided in the following:

National Overview

Country Profiles:

The Country Profile of each Contracting Party to the Barcelona Convention reports information on the following subjects:

OPRC – Preparedness for and response to marine pollution

- Contact list of national competent authorities
- Conventions and protocols
- National and regional system
- Response strategy
- Risk assessment
- Expertise
- Resources
- Training and follow-up

Prevention

- National competent authorities contact list
- List of ratified international conventions
- Implementation of international conventions [59]

Regional Synthesis:

The section "regional synthesis" compiles automatically in maps, tables and pie charts information from the Country Profile pages and provides a regional overview on the following aspects:

- Directory of competent national authorities (governmental, prevention, OPRC, 24 h, mutual assistance focal points), downloadable in PDF format
- Status of ratification of relevant conventions and protocols
- Contingency planning (national plans and subregional agreements)
- List of companies offering services in the Mediterranean Sea, downloadable in PDF format [59]

Regional Overview

MOIG from its end, based on REMPEC's Country Profile, developed a questionnaire aimed at collecting detailed information on the oil industry operating in the region (offshore facilities, refineries, ports, etc.).

REMPEC's and MOIG's questionnaires were analysed by a steering committee composed of representatives of REMPEC and MOIG and assisted by IPIECA and consultants selected by REMPEC and MOIG to support the preparation and

implementation of the Regional Government and Industry Workshop on Cooperation, Preparedness for and Response to Oil Spills in the Mediterranean Sea, which was held in Marseille, from 11 to 12 May 2009. The outcome of the analysis was summarised under the following six themes:

1. Contingency planning
2. Risk assessment
3. Strategy
4. Tier response approach and responsibilities
5. Resources and mutual assistance
6. Training and exercises [38]

5 Summary

The Regional Marine Pollution Emergency Response Centre for the Mediterranean Region (REMPEC) evolved from the Regional Oil Combatting Centre (ROCC), which was established in the mid-1970s to strengthen the capabilities of the coastal states around the Mediterranean in combatting, controlling and responding to oil pollution. Since the formation of REMPEC in 1989, its role and functions have expanded to address wider issues relating to pollution from ships and issues covered by the Prevention and Emergency Protocol 2002 [16]. Most REMPEC activities are now aimed at implementing the Mediterranean Strategy for Sustainable Development 2016–2025, which, in addition to prevention of and response to pollution from ships, also, as the name suggests, takes into account sustainable development goals [19].

Over the years of its existence, REMPEC has played a significant role in providing concrete support to its CPs in building their institutional frameworks for the prevention of and response to pollution from ships. For example, REMPEC has assisted the CPs in drafting, reviewing and adopting National Marine Pollution Contingency Plans, subregional agreements on pollution preparedness and response and in drafting more robust national legislation to give effect to and enforce the MARPOL Convention [24]. In addition to supporting the legal and institutional frameworks, REMPEC has engaged in strengthening the CPs capacity by providing training and arranging funding support for education to ensure that the national maritime administrations have the necessary knowledge and expertise to effectively implement relevant international conventions.

An important measure towards prevention of pollution was the compilation of an inventory of existing port reception facilities in non-EU countries [14]. Knowing where reception facilities exist is important, because it reduces the need, or temptation, to illicitly dump waste at sea, which is very relevant, particularly in view of the ever-increasing number of pleasure craft operating in the Mediterranean Sea region.

In terms of emergency response in case of pollution incidents REMPEC set up a 24/7 Centre through which CPs can request assistance in the form of information,

advice and coordination from REMPEC. Under the Pollution and Prevention Protocol 2002, parties to the Protocol can, through REMPEC or directly, request assistance to deal with a pollution incident. Such assistance can be in the form of advice but also equipment and personnel with special expertise, and REMPEC can play an important role in facilitating the administrative measures regarding the arrival, use and departure at the scene of the incident of such personnel and equipment [16].

A most significant role played by REMPEC, which is easily overlooked, is the fact that it provides a common forum for sharing and transferring information between a range of countries, which represent a variety of cultures and states of development. In this role REMPEC is a vehicle for harmonisation of existing legal and administrative frameworks as well as for continuous capacity building in the Mediterranean Sea region.

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