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REGIONAL MARINE POLLUTION EMERGENCY
RESPONSE CENTRE FOR THE MEDITERRANEAN SEA (REMPEC)

CENTRE REGIONAL MEDITERRANEEN POUR L'INTERVENTION
D'URGENCE CONTRE LA POLLUTION MARINE ACCIDENTELLE (REMPEC)

MEDITERRANEAN ACTION PLAN
PLAN D'ACTION POUR LA MEDITERRANEE



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**LESSONS LEARNT FROM THE MARINE POLLUTION INCIDENT
IN THE EASTERN MEDITERRANEAN
DURING THE SUMMER 2006**

Note by the Secretariat

Introduction

1. The spill response and the coordination of the international assistance to the marine pollution incident in the Eastern Mediterranean should be considered as an unusual case with its own specificities and particularities due to the hostilities in the Middle East and the nature of the pollution.
2. Spills caused by acts of war are rare but such a case already occurred in 1991 during the Gulf War where wildlife in the Persian Gulf was considerably damaged as a consequence of the oil spills. Fortunately, such incidents during conflicts represent a low percentage of incidents and, as such, should be considered as an exception. However, some of the lessons learnt from the marine pollution incident in the Eastern Mediterranean should be taken into consideration for further follow up action.
3. Some of the difficulties encountered during the incident were related to the war conditions and amongst these limitations should be highlighted the difficulty of dispatching any expert from or representing the Centre, due to the fact that REMPEC follows United Nations rules which require mandatory security clearance prior to any mission, and which, at that time, were only granted to Humanitarian Organisations such as the United Nations Office for the Co-ordination of Humanitarian Affairs. Moreover, the conditions on site prevented the Lebanese authorities from carrying out, at an early stage of the incident, detailed shoreline surveys, and aerial and sea surveys.
4. In addition, it should be highlighted that the Government of Lebanon, which ratified the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention), has had a national system for preparedness and response to accidental marine pollution under preparation since 2000. As a consequence, the lack of any approved national/local contingency plans and training as well as the small amount of

response equipment in the country left Lebanon in a difficult position to respond to an oil spill of this magnitude on its own.

5. Under such circumstances, REMPEC focused its efforts, in the first instance, in providing Lebanon with technical advice through the provision of technical guidelines and through the development of an Action Plan prepared by an International Group of Experts (*vide* paragraph 17. REMPEC/WG.28/9/2).

6. Taking into consideration the exceptional conditions in which the recent incident in the Eastern Mediterranean occurred as well as the difficulties in gathering information on the extent of the pollution, the present document focuses on areas of potential improvement as regards technical guidelines and highlights the importance and usefulness of decision support tools.

Principles and Guidelines on cooperation and mutual assistance

7. Within the context of an incident of a major magnitude, the type of assistance provided (advice, expertise, manpower, equipment, financial support, etc...) varies as well as sources (Bilateral, International, Intergovernmental/Non-governmental Organisations, private companies, individuals, etc...). This assistance contributes to the response operation, as expertise, equipment and manpower is required, *inter alia*, to carry out cleanup operations on extended stretch of shoreline (Lebanon over 150 km, Erika over 450 km and Prestige over 1,500 km), to protect various locations, to recover oil at sea (requiring heavy equipment and expensive means), etc...

8. However, massive mobilisation can also create difficulties and confusion due to the complexity of managing a multi-national and multi-organisation coordination and due to the quantity of information provided by the different sources which requires a methodical information screening and dissemination policy. In the light of the recent incident and in view of the numerous offer of assistance, it is crucial to establish, at the early stage of an incident, a coordination procedure in order to avoid duplication of efforts and increase the efficiency of international assistance.

9. In this connection, it should be recalled that since 1987 the Centre developed a series of Principles and Guidelines, on various aspects related to the cooperation during an oil spill incident. These Principles and Guidelines are listed hereunder:

- On the 11 September 1987, the Fifth Ordinary Meeting of the Contracting Parties to the Barcelona Convention adopted the “**Guidelines for co-operation in combating marine oil pollution in the Mediterranean**”
- On the 11 October 1991, the Seventh Meeting of the Contracting Parties to the Barcelona Convention adopted the “**Principles and guidelines concerning cooperation and mutual assistance**” which contained the following Principles, Guidelines and Check-list: :
 - Principles and Guidelines concerning the role and responsibilities of experts sent on mission by the Centre, following the request of a State in case of emergency, and duties and obligations of States towards them
 - Principles and Guidelines concerning the sending, receiving and returning of equipment in case of international assistance operation

- Principles and Guidelines concerning arrangements and operational procedures which could be applied in case of a joint operation
 - Check-list of procedures to be followed and persons to be contacted in case of emergency
 - Check-list of principal institutional provisions aimed at facilitating mutual assistance in case of a major marine pollution accident which should be included in national contingency plans
- Between the 5 and 8 June 1995, the Ninth Ordinary Meeting of the Contracting Parties to the Barcelona Convention adopted the ***“Guidelines concerning the exchange of liaison officers between the contracting parties in case of response operations involving several states”***, and ***“Guidelines concerning arrangements which might be made with a view to ensuring, in case of an accident, liaison between the Governmental Authorities and other interested Parties”***.

10. The recent experience has shown that there is a need to further investigate how to better coordinate the assistance and speed up its delivery. It seems that, in such occasions, the regional cooperation mechanism should play a more central role, as a clearing mechanism, between the country faced with the spill and the bilateral, regional and international offers of assistance, in order to avoid duplication of means and inadequacy of the assistance provided as compared with the actual needs.

Technical guidelines

11. Since the first major oil spills, numerous technical guidelines and studies were developed on the various topics related to spill response. During the remote assistance phase of the recent incident (*vide* paragraph 14-18, REMPEC/WG.28/9/2), technical guidelines were provided by the Centre as part of the initial immediate technical assistance. However, areas of improvement were identified as regards standardized approach of the shoreline assessment, use of waste management guidelines at national level as well as knowledge on sunken oil assessment, safety measures and recovery techniques.

12. It is to be noted that the problems associated with standard shoreline assessment and cleanup, waste management and the issue of the submerged oil were highlighted by the Fifth Meeting of the IMO OPRC-HNS Technical Group as being part of the challenges raised by the Lebanese case.

Shoreline clean up assessment

13. With regard to shoreline clean up assessment, it should be emphasised that when responding to accidental oil spills, this first step is crucial and is a key element to an effective decision.

14. Usually, a repetitive, detailed, and systematic survey of the extent and degree of shoreline contamination is basically needed for ¹:

- Assessment of the need for shoreline cleanup
- Selection of the most appropriate cleanup method
- Determination of priorities for shoreline cleanup

¹ US Coast Guard - RRT III Shoreline Countermeasures Manual

- Documentation of the spatial oil distribution over time

15. Also, repeated surveys are needed to monitor the effectiveness and effects of ongoing treatment methods (changes in shoreline oiling conditions, as well as natural recovery), so that the need for changes in methodology, additional treatment, or constraints can be evaluated.²

16. In the particular case of the recent incident in the Eastern Mediterranean, due to the impossibility of dispatching experts on site to assist the Lebanese Government *inter alia* to support the coordination of the response and to carry out shoreline clean up assessment, the Centre provided remote assistance and e-mailed several guidelines (*vide* paragraphs 14-18, REMPEC/WG.28/9/2).

17. However, due to the hostilities, shoreline survey could not be undertaken immediately after the incident. Hence, the assessment of needs for the shoreline cleanup, the selection of the most appropriate clean up methods, the identification of the most appropriate equipments required and its delivery as well as the definition of the priorities for shoreline clean up were delayed. At the beginning of August 2006, the Lebanese Ministry of Environment provided a list of visited sites with detailed information including the coordinates of the sites visited, the surface impacted and the type of shoreline. The information provided a better understanding of the extent of the pollution, but was not sufficient to determine the points referred in paragraph 14.

18. It has to be noticed that shoreline survey is usually carried out by professional teams properly trained on the various subjects required to produce a complete shoreline survey. In this regards, when the situation permitted, the Centre contacted experts on shoreline clean up assessment in order to carry out a detailed survey of the Lebanese coastline with a view to upgrade and update the information provided by the Lebanese authorities. Both Edward H. Owens and Cedre were contacted for their experiences on shoreline clean up assessment. Due to the fact that experts from Cedre were made available by the French Government, Cedre carried out the shoreline assessment and follow up surveys until February 2007 (*vide* paragraph 19, REMPEC/WG.28/9/2).

19. Several guidelines and studies on shoreline assessment have been developed aimed at providing practical and technical information to carry out shoreline surveys. It should be recalled that in 1977, Environment Canada began a shoreline response training programme, which continues today, and developed, for that purpose, checklists for shoreline surveys.(e.g., Owens, 1979). In 1990, Environment Canada began the preparation of a "Shoreline Clean up Assessment Team (SCAT) Manual" for British Columbia, which defined the standard terms and conditions, providing also the user with guidelines and directions for field use. The US National Oceanic and Atmospheric Administration (NOAA) subsequently adopted the Environment Canada (Environment Canada, 1992) and Exxon Valdez material into their own manual (NOAA, 1992). A review of the SCAT field forms identified some items or areas in need of improvement (Owens, 1999). This evaluation led to a cooperative upgrading of the forms by Environment Canada and NOAA that included: (i) a revised standard shoreline oiling form, (ii) a revised "short" form, (iii) a tar ball form, and (iv) a revised marsh/wetlands oiling form (Owens et al., 2000; Michel et al., 2001). For all intents and purposes, the systems and field forms used by the Environment Canada and NOAA are now identical. NOAA produced also a useful visual job aid to assist in the description of oiled shorelines (NOAA, 1998) in addition to the third edition of their SCAT manual (NOAA, 2000).³

² NOAA Shoreline Assessment Manual, Third Edition, 2000

³ The development of the SCAT process for the assessment of oiled shorelines by Edward H. Owens and Gary A. Sergy, 2003

20. In 2006, Cedre published the "Surveying Sites Polluted Guidelines" regarding operational guidance for conducting an assessment of coastal pollution. This guide seeks to present a coastal survey method likely to produce a useable, short and yet complete report.⁴

21. Most of these guidelines are available and can be downloaded from the respective websites of NOAA (www.response.restoration.noaa.gov) and Cedre (www.cedre.fr). The US Coast Guards also provide on their website basic information on the subject (<http://www.uscg.mil/d5/msafety/rrt/rcp/Policy/Countermeasures/1DPindex.html>).

22. As described above extensive work has already been developed and various guidelines already exist with their own survey form and instructions. However the guidelines present some differences due the context of their development.

23. In connection with the above mentioned, the Secretariat identified the following needs:

- to carry out a comparative study of the existing guidelines with a view to compile a list of best practice in the domain in a standard document which would also include standard forms;
- to subsequently develop a training programme on shoreline assessment based on existing programmes with a view to provide coastal States affected by a pollution incident the basic knowledge to undertake on their own, immediately after an oil spill and during the clean up operations, detailed and complete shoreline surveys.

Waste management

24. Waste management was also a major concern during the incident and caused a number of difficulties during the clean up operations. As on the 24 February 2007, a total amount of 7,280 m³ of contaminated waste was collected including 1026 m³ of liquid oil, 238 m³ of semi-solid oil and 6,016 m³ of polluted sand, pebbles, debris, etc... . In the case of the "AMOCO-CADIZ" incident, from 223,000 tonnes of spilled oil, 250,000 tonnes of waste were recovered, whilst in the "ERIKA" incident approximately 250,000 tonnes of waste were recovered from a spill of 19,800 tonnes. These figures clearly illustrate that clean up operations of major spills produce heterogeneous oily waste types and sometimes massive quantities. Due to the difficulties associated with the management of the waste, from its removal, transport to the final disposal and treatment, waste management is being considered as a key element of the contingency plan. It is thus a fundamental requirement that waste management is incorporated in the response strategy from the beginning of the response operation to ensure a successful response, avoid secondary contamination and minimize costs.

25. As for shoreline assessment, the issue of waste management is addressed in various documentation and specific guidelines. Amongst them, the second edition of *Section IV of the Manual on Oil Pollution - Combating Oil Spills* which was recently revised by IMO's OPRC-HNS Technical Group and approved by the Marine Environment Protection Committee (MEPC) of the IMO and published in 2005. The said section IV draws on the experience and lessons learned by Governments and Industry in responding to marine oil pollution worldwide during the last thirty years. It provides a clear and concise overview of the present level of knowledge, expertise and understanding in the field of oil spill response. The Section IV covers *inter alia* waste management and disposal as well as bioremediation which have been added in a new chapter. The aspect of national legislation and regulations

⁴ Cedre Surveying Sites Polluted Guidelines, 2006

is highlighted on issues such as direct disposal, land transport, stabilisation of oiled beach material and incineration.⁵

In 1993, the Oil Industry International Exploration and Production Forum (E&P Forum) published, the “*Waste Management Guidelines*” which have been prepared for those oil and gas exploration and production companies which require information on the range of waste management options available for wastes generated by their activities. The document covers a broader range of waste types as compared to the one previously mentioned. The document which provides a general description of waste management principles as well as options for waste reduction, recycling, treatment and responsible disposal gives an overview of the waste management concept.⁶

IPIECA has developed in the 12th Volume of the IPIECA Report Series, “*Guidelines for oil spill waste minimization and management*” which outline the sources of waste, how the waste should be collected, the storage considerations and the available disposal options. The document gives a broad picture of the problem of the waste management and provides details through matrix and brief technical description of various aspects of the waste management. The guidelines also partially raise the legislation issue and provide the example of the UK.⁷

Cedre published in 2004, Guidelines available in French, “*Gestion des Matériaux Pollués et Polluants issus d’une Marée Noire*”, whose main purpose is to provide the basic information required when making the first decision in case of emergency. The Guidelines are oriented towards the personnel in charge of the waste management during an oil spill in a French context. Moreover, the particularity of these Guidelines is that the French national legislation is taken into consideration and is integrated in the waste management procedure.⁸

26. Taking into consideration the existence of various guidelines in the field of waste management and their recent publication, the development of new guidelines should be discarded. However, as legislative and regulatory aspects can only be covered on a case by case basis, these issues are considered in the guidelines in a generic manner, with the exception of the guidelines developed by Cedre in the French context.

27. However, the lessons learnt from the Eastern Mediterranean incident showed that logistics and legal constraints remain the bottleneck of the waste management issue.

28. In order to define in advance a waste management strategy, each technical option should be analysed at national level taking into consideration the technical, logistical and legal constraints.

29. It seems that, based on the available technical guidelines the development of a standardized matrix approach could facilitate determination of the most suitable techniques for the country and also highlight, where necessary, regulatory amendments that have to be introduced in order not to be constrained when faced with an emergency.

Sunken oil assessment and techniques

30. As regard sunken oil, since the early days of the incident in the Eastern Mediterranean, it was predicted that part of the oil could sink near the shore due to the characteristic of the oil, the burning process and the fact that the oil coming from the land would most probably be mixed with sediment. Early in September, an Italian team of experts carried out a water investigation to assess the seabed contamination, to define the location and quantities of oil spilled on the seabed, and to initiate the oil recovering operations. In

⁵ IMO Publication - Section IV of the Manual on Oil Pollution - Combating Oil Spills, 2005

⁶ Oil Industry International Exploration and Production Forum, Waste Management Guidelines, 1993

⁷ IPIECA Report Series, Volume 12, Guidelines for oil spill waste minimization and management, 2004

⁸ Cedre - Gestion des Matériaux Pollués et Polluants issus d’une Marée Noire, 2004

addition, the NGO Baher Loubnan carried out a clean up operation of sunken oil during which 209 m³ of oil was recovered manually.

31. Difficulties in evaluating the exact amount of sunken oil in the area of the Jieh power plant station as well as the safety conditions of the sunken oil recovery operations during the incident emphasized the need to further investigate the assessment methods of sunken oil and to promote the basic safety requirements for this type of recovery operations. In this connection, it should be highlighted that, due to the limited number of incidents which required sunken oil recovery in shallow water, with the exception of some cases as the "HAVEN" incident in Italy, in 1991 and the "VOLGONEF 248" case in Turkey, in 1999, very little experience is available on the subject. As a consequence few studies and literature is available apart from the description of Moller (1992) on isolated occurrences of sunken oil, the review of Michal *et al* (1995) on behaviour of sunken oil and the compilation of annotated bibliography of literature on oil sinking by Kaperick (1997). Later on, the US National Research Council summarised the limited experience available on the issue (National Research Council, 1999) and Cabioc'h reported the state of the art of sunken oil studies and recovery work (*ibid*).⁹

32. Most recently, the European Community financed, in 2001, the DENIM Project (Détection de Nappes Immergées) concerning Detection of sunken oil slicks involving Cedre, Ifremer and ICRAM. The conclusions of the study reflected the need to test underwater systems able to detect submerged pollutants, such as heavy oils, deposited on the sea-bottom or in the water column and to adapt already available systems in order to improve the tracking of this pollution and to facilitate future work in case of an oil spill.¹⁰

33. During the Third Research and Development Forum on High-density Oil Spill Response, held in Brest, France, between 11-13 March 2002, recovery of sunken oil was discussed and recommendations were reported to the MEPC 48 in the document MEPC 48/6/2 and MEPC 48/INF10. The recommendations concerned mainly removal techniques and detection of oil from wrecks, and removal techniques from greater depths.

34. In 2006, the Research & Development of the US Coast Guard prepared a study on "Assessment and recovery of submerged oil: Current state analysis" which provides descriptions of recent sunken oil cases and presents sunken oil detection, containment and recovery techniques. Most recently, in January 2007, a workshop on sunken oil was organised by the US Coastal Response Research Center due to the arising number of incidents involving sunken oil problems ("ATHOS I" incident, Philadelphia in November 2004, Chicago Sanitary and Ship Canal incident in January 2005, and Gulf of Mexico incident in November 2005).

35. In light of the recent incident in the region, and taking into consideration that guidelines on sunken oil assessment and removal techniques do not exist, the development of technical guidelines on the subject, including any practical related matter such as safety measures, would be of interest both at the international level and also at regional level.

Decision support tools

36. Since the hostilities in the region led to a naval and aerial blockade, neither aerial nor naval surveys of the polluted sites and the situation at sea could take place. Although no official report of oil slicks at sea were received by REMPEC, another early concern was related to the presence at sea of a free floating oil slick, which was considered as a potential risk for the neighbouring countries.

⁹ Recovery of sunken oil in the Sea of Marmara, T. Moller, ITOFF, 2002

¹⁰ DENIM, Executive Summary, 200

37. In order to monitor the situation at sea taking into consideration the unavailability of aerial and naval surveillance, REMPEC requested the Government of Cyprus to run the oil spill model MEDSLICK, developed specifically for the Eastern Mediterranean, and which could provide an indication on whether or not a part of the oil could reach other Mediterranean coastal States, north of Lebanon. REMPEC also investigated the possibility of obtaining satellite images from various sources, with a view to cross validating the results of the model, which, at that stage, could only be considered as an indication at that stage. The Joint Research Centre (JRC) of the European Commission (EC) provided analysed satellite images (SAR) through the EC-MIC.

38. The MEDSLICK model provided information on the expected distribution of oil along the Lebanese shorelines and also confirmed the serious risk of remobilization of part of the oil that was floating along the Lebanese shorelines. The predictions of the model as well as the satellite images were showing the movement of part of the oil spilled towards north of Beirut and later further north towards south of Tartus, in Syria. On 4 August 2006, on the basis of the analysis of an image taken on 3 August 2006, EC-JRC concluded that "the extent of the spilled area has increased reaching the southern part of the Syrian coast". This information was confirmed when the Syrian Ministry of Environment requested the assistance of REMPEC on the 6 August 2006, after the Syrian shorelines were affected with oil slicks.

39. The SAR images analysed by EC-JRC enabled the identification and location the oil spill/slicks and facilitated the forecast of their movement. In addition, the images were shared with the Oceanography Centre of Cyprus in order to integrate the information provided in its model. Since the satellite images cannot provide information on the thickness of an oil spill, no estimation of the volume of oil at sea could be provided. Aerial and boat surveys, which could only be conducted during the second half of August 2006, subsequently confirmed that there was no oil on the high seas, excluding therefore any threat for the neighbouring countries to be affected by the oil spilled in Lebanon.

40. Following the incident, the Centre participated in the Workshop on monitoring activities related to the oil pollution in Lebanon organized in the framework of the 6th European Group of Experts on Satellite Monitoring of Sea-Based Oil Pollution (EGEMP) Meeting held in Ispra, Italy, between the 17 and 18 October 2006. A report of the workshop is available on the EGEMP website (<http://egemp.jrc.it>).

41. During the incident in the Middle East, predictive models and satellite imagery provided, invaluable information and appeared extremely useful tools, especially when combined and cross-validated with other sources of information, in order to set a basis for a response strategy.

The Meeting of Focal Points is invited to:

- **take note** of the information provided by the Secretariat in the present document;
- **provide views and comments** on the technical issues highlighted by the Secretariat in paragraphs 10, 23, 29 and 35 of the present document.