SEA for Petroleum Activities

In Lebanese Waters

2011/2012

Vol. 2 National Contingency Plan

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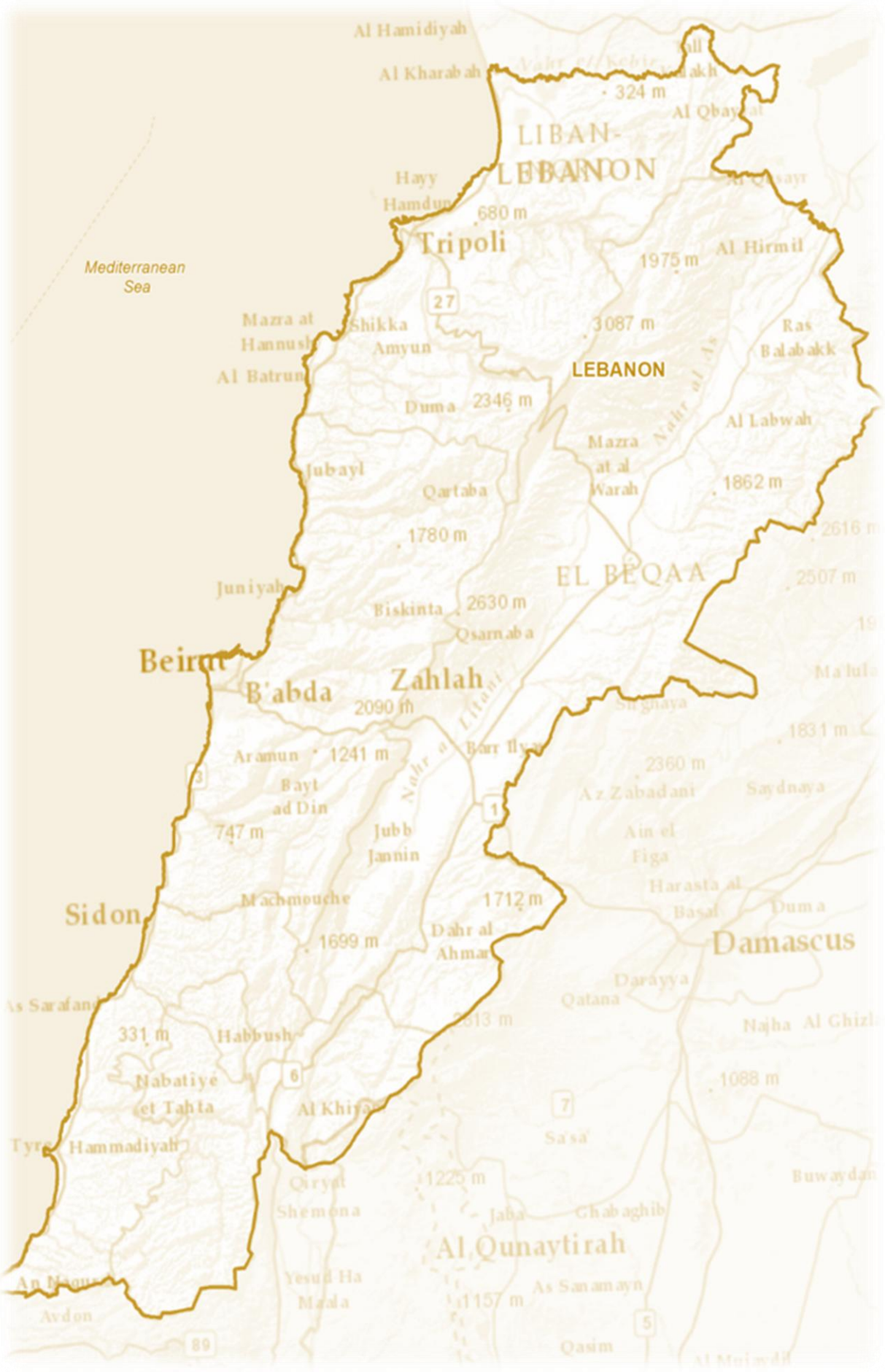
REPUBLIC OF LEBANON
MINISTRY OF ENERGY AND WATER

RPS Energy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Al Qbayat
LIBAN-
LEBANON
Hayy
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680 m
Tripoli
Al Hirmil
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Mediterranean
Sea
27
Mazra at
Hannush
Shikka
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3087 m
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LEBANON
Duma
2346 m
Al Labwah
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Warah
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Jubayl
Qartaba
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EL BEQAA
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Juniyah
Biskinta
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Qsarnaba
Beirut
B'abda
Zahlah
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Sighaya
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Aramun
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Barr Ilyas
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Bayt
ad Din
Az Zabadani
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Jubb
Jannin
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Figa
Harasta al
Basal
Duma
Sidon
Machmouche
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Damascus
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Dahr al
Ahmar
Darayya
Qatana
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Habbush
Najha
Al Ghizl
Nabatiye
et Tahta
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Al Khiyam
Tyre
Hammadiyah
Sa'sa'
Qiryat
Shemona
1225 m
Buwaydan
Jaba
Ghabaghib
Al Qunaytirah
Yesud Ha
Mazala
As Samamayn
1157 m
Avdon
Qasim
89
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List of Abbreviations

Glossary	
ADIOS	Automated Data Inquiry system
ALARP	As Low As Reasonably Practicable
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
BOP	Blow Out Preventer
Bopd	Barrels of oil per day
Bbls	Barrels
CBT	Clean Ballast Tank
CEDRE	Centre de documentation, de recherché et d'expérimentations sur les pollutions accidentelles des eaux
CLC:	International Convention on Civil Liability for Oil Pollution Damage, 1992
CMP	Crisis Management Plan
COW	Crude Oil Washing System
CRT	Crisis Response Team
DOR	dispersant-to-oil ratio, or dispersant application rate
DR	Chief Executive of MoEW's Designated Representative
EEZ:	Exclusive Economic Zone
ERP	Emergency Response Plan
ESI	Environmental Sensitivity Index
FLIR	Forward Looking Infrared Scanner
FOB	Forward Operating Base
GIS:	Geographic Information System
GRT	Gross Registered Tonnage
GOS	Gas Oil Ratio
HFO	Heavy Fuel Oil
HSE	Health Safety and Environment
IAP	Incident Action Plan
IC	Incident Commander
ICS:	Incident Command System
IMO:	International Maritime Organization
IOPC Fund	International Oil Pollution Compensation Fund

IPIECA:	International Petroleum Industry Environmental Conservation Association
IR	Infrared
ISO	International Standards Organization
ITOPF:	International Tanker Owners Pollution Federation Limited
Km	Kilometre
MARPOL 73/78:	International Convention for the Prevention of Pollution from Ships, 1973, and its Protocol, 1978
MoE	Ministry of Environment
MoEW	Ministry of Energy and Water
MoT	Ministry of Transport
MSDS	Material Safety Data Sheet
NCP	National Contingency Plan
NGO	Non Government Organisation
NM	Nautical Mile
OILPOL:	Oil Pollution Reporting Format
OPRC:	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
OSC:	On Scene Commander
OSOCC	Oil Spill Operations and Coordination Centre
OSCP	Oil Spill contingency Plan
OSRL	Oil Spill Response Limited, Southampton, UK
PAH's	Polycyclic Aromatic Hydrocarbon
PPE	Personal Protective Equipment
ppm	parts per million
PSV	Platform Supply Vessel
P&I Clubs:	Professional and Indemnity Clubs
REMPEC	Regional Marine Pollution Emergency Response Centre
RoL	Republic of Lebanon
ROV	Remote Operated Vehicle
SAR	Search and Rescue
SBM	Single Buoy Mooring
SBT	Segregated Ballast Tank
SLAR	Side Looking Airborne Radar
SOLAS	Safety of Life at Sea

SOPEP	Shipboard Oil Pollution Emergency Plan
STCW	Standards of Training, Certification and Watch keeping for Seafarers
TDS	Total Dissolved Solids
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea 1982
UNESCO	United Nations Education, Scientific and Cultural Organisation
UV	Ultra Violet
WCE	Well control Expert
WBM	Water Based Mud

List of Ministries

Abbreviation	Formal Term
MoA	Ministry of Agriculture
MoD	Ministry of Displaced
MoE	Ministry of Environment
MoEdu	Ministry of Education
MoET	Ministry of Economy & Trade
MoEW	Ministry of Energy & Water
MoF	Ministry of Finance
MoFAE	Ministry of Foreign Affairs
MoIM	Ministry of Interior & Municipalities
MoInd	Ministry of Industry
MoInfo	Ministry of Information
MoJ	Ministry of Justice
MoL	Ministry of Labour
MoND	Ministry of National Defence
MoPH	Ministry of Public Health
MoPT	Ministry of Post & Telecommunications
MoPWT	Ministry of Public Works & Transport
MoSA	Ministry of Social Affairs
MoT	Ministry of Tourism
MoYS	Ministry of Youth & Sports

Part A: National Strategy

1. INTRODUCTION

1.1. Purpose and objectives of the national contingency plan for marine pollution

The purpose of this National Contingency Plan (NCP) for marine pollution is to establish the national framework for preparing for and responding to oil spills in the Republic of Lebanon (RoL) marine waters. The objective is to provide the basis for more efficient oil spill response operations under the overall authority of the Lebanon Ministry of Energy and Water

In particular, the NCP provides the legal basis for implementing the Government of Lebanon's (GoL) obligations under the Oil Pollution Preparedness, Response and Co-operation Convention, 1990 (OPRC) (see Annex A). It also implements the Government's obligations under the regional Barcelona Convention for the protection of the Mediterranean Sea (see Annex C).

1.2. Scope of the plan

The NCP describes the policies and operational procedures for the response to oil spills in the marine waters of the Republic of Lebanon, including the organisational relationships of the various bodies involved. The scope of this contingency plan includes all the marine and coastal waters under the jurisdiction of the RoL, including ports, harbours, and waters within the Exclusive Economic Zone (EEZ). On land, it includes the foreshore and any adjacent land affected by an oil spill.

The NCP does not cover oil spills in Lebanon’s fresh water system; nor does it cover oil spills on land.

To the extent that it is feasible, this contingency plan also provides the basis for response to marine pollution incidents involving hazardous and noxious substances other than oil.

References to “marine pollution” therefore refer to pollution by oil or other hazardous substances. “Oil” means oil of any description. “Other hazardous substances” include any substance that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Such pollution can result from spills of ships’ cargoes carried in bulk or in packages, ships’ bunkers, and leaks from oil and gas installations and pipelines.

1.3. Content of the NCP

The contingency plan is divided into four parts:

- Part A : National Strategy
- Part B : Operational Procedures
- Part C : Data Directory
- Annexes

Part A of the NCP is addressed to administrators and those who will be responsible for preparing local (Tier One) oil pollution emergency plans. It describes the institutional framework for oil spill preparation and response in Lebanon, including the role and

responsibilities of Ministry of Energy and Water (MoEW) and all support agencies. In particular, Part A of the NCP contains all the national policies (e.g. combat strategy; policy on the use of dispersants; etc) which have been approved. All local oil pollution emergency plans must be compatible with the policies described in Part A of the NCP.

Part B of the NCP is of operational character and is addressed to the operators (On Scene Commanders (OSC) and team leaders) who will take command of response actions at the scene of an incident.

Part C of the NCP is a data directory containing lists (e.g. contact points; equipment lists) and summaries of key data (e.g. maps; summaries of wind statistics and current data).

The Appendices contain supplementary information which may not be necessary to refer to in an oil pollution incident but which nevertheless contain important information for reference (e.g. a summary of the national and international legal framework; the framework for liability and compensation).

1.4. Definitions

In this contingency plan:

"Counter pollution operations" means any action taken to prevent, monitor, reduce or combat pollution or the threat of an oil pollution incident at sea and any action to clean-up the shoreline which is contaminated by an oil pollution incident.

"Incident commander" means the person exercising overall command of an oil pollution incident.

"National Oil Spill Contingency Plan" (or its abbreviation NCP) means the national plan for preparedness and response to oil pollution incidents, including the organisational relationship of the various bodies involved, prepared by the Lebanon Ministry of Energy and Water.

"Oil" means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products.

"Oil pollution emergency plan" means a contingency plan (other than the National Oil Spill Contingency Plan) setting out the arrangements for responding to incidents which cause or may cause marine pollution by oil (including the nomination of an On Scene Commander), with a view to preventing such pollution or reducing or minimising its effect. This plan shall be based on a risk assessment which will form the basis of the oil spill equipment to be provided under the plan.

"Oil pollution incident" means an occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil and which poses or may pose a threat to the

marine environment, to the coastline or related interests of the Republic of Lebanon, and which requires emergency action or other immediate response.

"On Scene Commander" means the person named in the local oil pollution emergency plan, or the person nominated to take command of response actions at the scene of the incident,

both at sea and on land. The OSC has overall decision making responsibility for the tactical response to an oil pollution incident and should be supported by appropriate operational, scientific and administrative personnel.

"Overall command" means the full responsibility for the direction of counter pollution operations, both at sea and on land, during an oil pollution incident.

1.5. Distribution of the NCP

All government bodies and private companies which have a role to play or which could be affected by an oil pollution incident will receive a copy of the national contingency plan. A list of the holders of the NCP is in Part C.

It is the responsibility of all plan holders to notify the Ministry of Energy and Water (MoEW) of any changes in the telephone and fax numbers of the contact points listed in Part C.

1.6. Plan Revision

The NCP is saved in a word processing format (MS Word) and distributed to plan holders in loose-leaf format.

The Ministry of Energy and Water (MoEW) will be responsible for issuing revisions to the contingency plan whenever necessary and distributing amendments to all plan holders. Revisions to Parts A and B will only be issued when the amendments have been approved by the MoEW. Amendments to Part C and the Annexes will be issued whenever there is a need to update the information therein.

It is the responsibility of all plan holders to notify MoEW of any changes in the telephone / mobile / email or fax numbers of the contact points listed in Part C, and also of any changes in equipment stockpiles.

Whenever any page of the NCP is amended, the revised page will be circulated by MoEW to all plan holders accompanied by a revised Table of Contents. It will be the responsibility of each plan holder to incorporate the amendments into their copy of the national contingency plan to keep it up to date.

2. ROLES AND RESPONSIBILITIES OF KEY ORGANISATIONS

2.1. Ministry of Energy and Water

The Lebanese Ministry of Energy and Water (MoEW) is responsible for formulating general policy and preparing the necessary plans for the protection and promotion of the environment. It is also required to follow up the implementation of such plans in coordination with the competent administrative authorities.

Accountabilities of the Lebanese Ministry of Energy and Water

MoEW shall be responsible for establishing a national system for responding promptly and effectively to oil pollution incidents. In particular:

- MoEW shall be the competent national authority with responsibility for oil pollution preparedness and response;
- MoEW shall be the national operational contact point responsible for the ultimate receipt of oil pollution reports, although other government bodies may receive notification of such reports in the first instance in accordance with the National Contingency Plan;
- MoEW shall be the authority which is entitled to act on behalf of the Government of Lebanon to request assistance from external sources or to decide whether to render assistance when requested by a neighbouring State with whom it has bilateral or multilateral agreements;
- MoEW shall be responsible for preparing the National Contingency Plan and keeping it up to date;
- MoEW shall be the government agency responsible for the coordination of Lebanon's policy on oil spill preparedness and response, including international affairs;
- MoEW will assist agencies, whether from the private or the public sector, to fulfil their obligations under this Contingency Plan through training, institutional support and, where appropriate, through financial support.
- MoEW shall have a general responsibility for coordinating the participation of the petroleum sector in the implementation of the NCP;
- MoEW shall have a particular responsibility for ensuring that offshore installations and oil handling installations prepare and implement local (Tier One) oil pollution emergency plans in accordance with the NCP;
- MoEW shall ensure that the national policy on the use of dispersants is applied by the petroleum sector;
- MoEW shall be responsible for identifying ways and means of disposal of oily wastes, including recycling, in close co-operation with MoE;
- MoEW shall ensure that all offshore installations and oil handling installations send oil pollution reports directly to MoEW / MoE, using the agreed notification procedures;

2.2. National Contingency Planning Committee

To assist it in its task, the MoEW shall be advised by a National Contingency Planning Committee (NCPC) composed of the following members:

- Minister of Energy and Water (Chairman)
- Ministry of Environment
- Ministry of Interior and Municipalities (DG of Civil Defence)
- Ministry of Public Works and Transport
- Ministry of National Defence
- Ministry of Agriculture (Fisheries)
- Ministry of Public Health
- Representative of each of the Petroleum and Petroleum Products Producing Companies
- Harbour Master
- Chief of Search and Rescue
- National Centre for Scientific Research (Marine Biology Specialist)

Terms of Reference

The terms of reference of the National Contingency Planning Committee shall be as follows:

1. To assist the MoEW to develop and implement a comprehensive National Contingency Plan for Lebanon's coastal waters;
2. To advise, cooperate and take any other action which may be appropriate in order to achieve the long term objective, *viz*. to enable the MoEW, and other entities involved in the NCP, to respond appropriately to oil spills in Lebanese coastal waters;
3. To keep under review on a permanent basis the procedures of the NCP and make appropriate recommendations to MoEW for keeping it up to date.
4. To define the responsibility of the polluter and to take the necessary measures for compensation and to follow the process of compensation.
5. To follow the training necessary for implementing the Plan.
6. To follow-up purchase of the equipment necessary for implementing the Plan.
7. To meet at least twice every year, except in emergency cases, at the invitation of the chairman or with the agreement of two third of the members.

2.3. Accountabilities of Support Agencies

2.3.1 The Ministry of Public Works And Transport

The Ministry of Public Works and Transport (MoPWT)has primary responsibility for:

- the safety of navigation in Lebanese waters, including the establishment of vessel traffic systems and the operation and maintenance of lights, radio beacons and

other navigational aids and the safety of shipping, in particular the implementation of the Convention on the Safety of Life at Sea (SOLAS);

- supervision of and co-operation in defining and implementing national policy towards protection of the marine environment within the area of jurisdiction of the port authorities, including private ports (petroleum, tourism and fisheries ports);
- the prevention of pollution from ships, in particular the implementation of the International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/78) and, where relevant, discharges from offshore platforms;
- ensuring that port authorities inspect the Oil Record Books of any ships, including those registered in Lebanon and flying the flag of countries party to the MARPOL Convention, and inspect the cargo record books of tankers carrying harmful liquid substances in bulk;
- operating and managing Lebanese ports through the medium of autonomous port authorities.

Accountabilities under the NCP

In the context of the NCP, the MoPWT shall have the following rights and responsibilities:

- MoPWT shall have a general responsibility for coordinating the participation of its agencies and the port authorities in the implementation of the NCP, including the conduct of surveillance for illegal discharges of oil and other polluting substances from ships;
- MoPWT shall have a particular responsibility for ensuring that the port authorities under its jurisdiction prepare and implement local (Tier One) oil pollution emergency plans in accordance with the NCP;
- MoPWT shall ensure that the national policy on the use of dispersants is applied by port authorities within their area of jurisdiction;
- MoPWT and its port authorities may be requested to provide prompt assistance and support in order to combat an oil pollution incident.
- MoPWT shall nominate a representative on the National Contingency Planning Committee.
- MoPWT Port authorities shall receive all initial notifications of oil pollution incidents from merchant shipping and the lighthouses and radio reporting centres under its jurisdiction.
- MoPWT Port authorities shall notify MoEW immediately about oil pollution incidents.

2.3.2 Ministry of National Defence : Navy

The Lebanese Navy has primary responsibility for the protection of the waters under Lebanon's jurisdiction (the territorial waters and the exclusive economic zone) in times of peacetime and war. In order to fulfill this mandate, the Lebanese Navy undertakes regular patrol missions in Lebanese coastal waters and international waters.

The Lebanese Navy is invested with powers of arrest and has the authority to escort a vessel observed to be infringing international conventions or Lebanese law to the nearest port.

Accountabilities under the Law for the Environment

Military or support ships of the RoL are not subject to the rules of the MARPOL 73/78 Convention. Nevertheless, military or support ships of the RoL shall take all necessary precautions to prevent polluting the territorial sea or the exclusive economic zone of the RoL.

In the context of the NCP, the Navy shall have the following rights and responsibilities:

- the Navy will instruct all its vessels on routine patrols to report any pollution incidents they observe and any floating oil slicks to their appropriate naval base and naval HQ. The information to be collected by naval vessels shall follow the OILPOL format;
- Naval HQ will notify MoEW about oil pollution incidents:
- wherever possible, the Navy will take photographs, samples of floating oil for further analysis in accordance with procedures for sample taking to be developed by MoEW, and any other evidence which may be used to prosecute violations of the law;
- the Navy will represent the Ministry of National Defence as a member of the National Contingency Planning Committee.

2.3.3 Ministry of National Defence : Air Force

The Lebanese Air Force has primary responsibility for the protection of Lebanon's air space in times of peacetime and war. In order to fulfil this mandate, the Lebanese Air Force undertakes regular patrol missions over Lebanese coastal waters and international waters.

Accountabilities under the NCP

In the context of the NCP, the Air Force shall have the following responsibilities:

- the Air Force will instruct all its aircraft on routine patrols to report any pollution incidents they observe and any floating oil slicks to their appropriate air force base and air force HQ.
- Wherever possible photographs will be taken as corroborative evidence. To the extent possible, the information to be reported shall follow the OILPOL format;
- the Air Force will establish a system of routine aerial surveillance, in close co-operation with MoEW, in order to enhance the enforcement of the MARPOL 73/78 Convention and identify polluters of Lebanese coastal waters;
- Air Force HQ will notify MoEW about oil pollution incidents:

2.3.4 Ministry of National Defence : Army

The Lebanese Army is responsible, *inter alia*, for the defence and security of Lebanon's land territory. It has large resources of manpower and equipment which could be used for responding to environmental disasters, such as a major oil spill which contaminates Lebanon's coastline.

Accountabilities under the NCP

In the context of the NCP, the Lebanese Army shall have the following responsibilities:

- to assist MoEW when requested in the organisation of manpower and equipment, including communications equipment, especially in the response to shoreline clean-up.

2.3.5 Mohafez

Mohafez are appointed directly by the President. They are the representatives of the President and the Prime Minister within the geographical area of their jurisdiction. In this capacity Mohafez are in a position of extreme importance with extensive powers for action, especially in cases of emergency.

The Mohafez are responsible for implementing at the local level the national policies of the State. Among other things, they are responsible, together with municipalities, for garbage collection and waste disposal. They also have control over permitting.

There are 4 coastal Mohafez: North (*al-Shamal)*, Beirut, South (*al-Janoub) a*nd Nabatieh

Accountabilities under the NCP

In the context of the NCP, coastal Governorates shall have the following responsibilities:

- in the case of a major pollution of the coastline following an oil spill, the Governor will appoint a representative on the committee coordinating the shoreline clean-up action;
- MoEW will provide an adviser to provide technical guidance and expertise on appropriate clean-up strategies, including the acceptability of expenditure if the costs are to be reimbursed from the Environmental Protection Fund;
- coastal Governorates will be responsible for providing temporary storage facilities for oily wastes and for allocating final disposal sites for the disposal of used oil which is not capable of being delivered to a refinery for treatment.

2.3.6 Ministry of Finance : Customs

The Customs authorities are responsible for inspecting the import and export of goods to and from Lebanon and levying any customs duties or sales tax due.

Accountabilities under the NCP

In the context of the NCP, the Customs authorities shall have the following responsibilities:

- the Customs authorities shall prepare in advance standing approvals for the temporary import of oil spill combating equipment without delay and without payment of duties;

- when requested by the MoEW in a Tier Three oil pollution incident, the Customs authorities shall nominate an officer to serve on the Emergency Response Committee. This officer shall have the authority to oversee and facilitate the import of equipment from abroad for combating the oil spill.

2.3.7 Ministry of Interior and Municipalities : Immigration authorities

The immigration authorities are responsible for controlling the entry into Lebanon of all foreign nationals.

Accountabilities under the NCP

In the context of the NCP, the immigration authorities shall have the following responsibilities:

- the immigration authorities shall prepare in advance standing approvals for the temporary immigration without delay of oil spill strike teams from abroad that are called upon to assist the Government of Lebanon in a Tier Three oil pollution incident;
- when requested by the MoEW in a Tier Three oil pollution incident, the immigration authorities shall nominate an officer to serve on the Emergency Response Committee. This officer shall have the authority to oversee and facilitate the necessary visas or other formalities for the entry of foreign strike teams.

2.3.8 Ministry Of Public Health

Health authorities are responsible for co-ordinating the public health aspects of the response to an incident. Health Authorities are to ensure that they can respond to incidents, including by preparing contingency plans and arranging for getting advice and expertise to deal with potential hazards to public health.

Operational response to public health issues will always be from the public health department of the local health authority. Public health cover is on call 24 hours a day to cover communicable diseases and human health issues.

2.3.9 Oil Industry

The major oil companies have resources for oil recovery and other counter pollution operations. The companies may be able to provide tankers and other ships on charter and may be a source of technical information on tankers and tanker operations. They will also have contingency plans for dealing with spills in oil terminals operated by them.

2.3.10 Marine Insurers

Shipowners generally have two types of insurance: “hull” insurance and “liability” insurance. A ship owner’s hull insurance covers damage to the ship’s hull or machinery and a proportion of traditional salvage awards. Liability insurance covers the shipowner’s liability to third parties, including the costs of reasonable measures taken to prevent or minimise pollution and special environmental awards to salvors.

Most shipowners take out liability insurance by entering their ship with one of the members of the International Group of Protection and Indemnity (P&I) Clubs. P&I clubs are mutual, non-profit making associations that insure their members (shipowners, charterers,

managers, and operators) against third party liabilities, including pollution liabilities. Each P&I club has full time managers who look after the day-to-day business of the club, including dealing with claims for compensation.

Cargo owners normally have cargo insurance to cover loss suffered by the cargo owner in the event of damage to, or loss of, the cargo during the course of a voyage and a proportion of traditional salvage awards.

2.3.11 The International Oil Pollution Compensation Fund ("IOPC Fund")

The IOPC Fund provides compensation (up to limit) for pollution damage caused by persistent oil carried by tankers if, and to the extent that, compensation available from the shipowner is inadequate.

2.3.12 The International Tanker Owners Federation Ltd (ITOPF)

ITOPF has a staff of technical experts to respond to marine oil spills anywhere in the world. Its principal role is to give practical advice on clean up techniques and the mitigation of damage. It normally performs this service at the request of shipowners, P&I clubs, and the IOPC Fund.

ITOPF gives guidance on what counter pollution operations are reasonable, bearing in mind the provisions of the relevant treaties and the IOPC Fund's claims admissibility guidelines.

3. NOTIFICATION AND REPORTING PROCEDURES

3.1. Notification Procedures

Reports of oil pollution at sea - and reports of marine accidents which have caused, or which threaten to cause, pollution - can come from a number of sources:

- as a result of planned surveillance activities
- through the observations of government agencies (e.g. port authorities, Navy, governorates)
- from passing shipping or overflying commercial aircraft
- from those responsible for the incident
- from the general public.

The MoEW is on call 24 hours a day**.** The procedures for contacting MoEW are set out in sections Appendix A.1 and Section 3.2 below.

In order to operate effectively, the MoEW must:

- be alerted promptly to any spillages of oil or threatened spillages of oil
- be given adequate and accurate information
- have effective lines of communication with support agencies and the petroleum sector.

3.1.1 Reports from planned surveillance activities

It is the wish of MoEW to enter into partnership with appropriate agencies in order to establish a national system of surveillance in order to enforce the provisions of the MARPOL 73/78 Convention and to receive early warning of oil slicks. Such surveillance activities, if and when established, will include their own notification procedures for alerting MoEW.

3.1.2 Reports from government agencies

In many cases government agencies will be the first to receive reports of oil pollution incidents. (In this case, government agencies include port authorities, the Navy and civil police, governorates). It is imperative that information is transmitted without delay to MoEW in the required format as set out in section Appendix A.1.

3.1.3 Reports from shipping

The International Maritime Organization (IMO) has a standard reporting format and procedures for the reporting of incidents involving the loss - or likely loss - of dangerous goods, harmful substances and marine pollutants, including oil.

Reports in the same format should also be made, in accordance with this contingency plan, whenever oil (or other harmful substance) is observed at sea or whenever any ship is seen to be discharging oil (or other harmful substance) in contravention of MARPOL 73/78.

All reports from shipping are required to be transmitted in the first instance to the Ports Authorities of the Ministry Transport. It is the responsibility of the port authority to notify MoEW without delay in the required format as set out in section Appendix A.1.

3.1.4 Reports from aircraft

In accordance with IMO recommendations, arrangements will be made with the Lebanese civil aviation authority to require pilots of aircraft to report to the appropriate air traffic control authority when substantial patches of oil are observed on the surface of the sea. Such reports will then be referred to the MoEW.

3.1.5 Reports from those responsible for the incident (other than ships)

All companies responsible for oil transport consignments and operating in oil extraction shall notify the competent administrative bodies of every oil leakage incident upon its occurrence. In this context, the competent administrative body is the MoEW to whom reports shall be submitted without delay in the required format as set out in Appendix A.1.

3.1.6 Obligations for response action

The obligation on government agencies and those responsible for a pollution incident (other than ships) to notify MoEW directly of such incidents does not in any way affect the responsibilities of government agencies and oil handling companies to mount the first response to an incident as prescribed in Section 5.

3.1.7 Situation Reports

After the initial notification to MoEW of an oil pollution incident (in accordance with section A3.2), any company or authority which retains the responsibility for managing the response to the incident shall continue to keep MoEW informed of developments by means of regular situation reports. There is no prescribed format for such reports.

3.2. Contacting MoEW

In the event of a Tier Two or Tier Three spill, MoEW should be contacted immediately by telephone.

Emergency contacts: 24 hr "Hot Lines" **(1) Tel: XXXX (To Be Confirmed)**

(2) Tel: XXXX (To Be Confirmed)

Written confirmation, using the OILPOL format, should be faxed as soon as possible to:

Fax: XXXX (To Be Confirmed)

In the event of a Tier One spill, MoEW should be faxed as soon as possible using the OILPOL format.

4. TIERED RESPONSE CONCEPT AND INITIAL RESPONSE PROCEDURES

4.1. The concept of "Tiered Response"

A number of factors need to be taken into account in determining which agency should have responsibility for mounting the initial response action to an oil spill:

- the origin (or source) of the spill
- the geographical location of the spill
- the size of the spill
- the sensitivity of the areas threatened by the spill.

These factors, and in particular their relative importance to each other, can all be taken into account in the "tiered response" concept. This is a widely accepted operational concept that provides a convenient categorisation of response levels and a practical basis for oil spill contingency planning. Tiered response recognises three levels.

Tier One

Tier One is concerned with preparedness and response to a small spill within the capabilities of an individual facility or port authority. The type of incident typically involved would generally be associated with ship transfer or bunkering operations at a jetty, pier or mooring and around waterside storage tanks. The response will be controlled by the company's or the port's operating procedures in accordance with its own site-specific oil pollution emergency plan. The response will be mounted using company or port authority personnel and company-owned or port-owned (or shared) oil spill combating equipment.

The Tier One local oil pollution emergency plan should recognise the need for local operators and port authorities to control events and to establish a rapid response capability aimed at quickly containing and, if possible, recovering the spilled oil. If this is achieved there will be no need to involve other parties apart from meeting any legal, information or notification requirements.

The upper limit - in terms of spill size - to a Tier One response for the purposes of the Lebanon National Contingency Plan will vary and will be specified in each facility's or port's site specific oil pollution emergency plan.

Tier Two

By definition, Tier Two is concerned with preparedness and response to a spill that requires the coordination of more than one source of combating equipment and personnel (strike teams). Incidents necessitating a Tier Two response would typically be associated with shipping accidents in ports and harbours, or in estuaries or coastal waters, but could also arise from fractured pipelines, tank failures or near shore exploration and production operations.

The concept of Tier Two recognises that an individual company or port authority has limited control over events (apart from mounting the initial response if the incident occurs within their area of jurisdiction) and the geographical area affected by the spill will necessarily be larger than in a Tier One case. In many cases, public amenities will be threatened.

In principle, MoEW will take responsibility for coordinating the response to a Tier Two incident; although the Agency may delegate its coordinating role to another body (see Section 5). A Tier Two response originating in the petroleum sector will continue to be directed by the contingency planning arrangements detailed.

Tier Three

Tier Three is concerned with a major spill - in excess of 500 tonnes - requiring the mobilisation of all available national resources and, depending on the circumstances, may involve the mobilisation of assistance through sub-regional cooperation agreements with neighbouring countries or international assistance from the oil industry's support organizations or other industry arrangements. In most cases the spill will involve a major accident involving a laden oil tanker.

MAJOR OIL POLLUTION INCIDENTS OFTEN BECOME HIGH PROFILE AND POLITICALLY SENSITIVE. MoEW WILL ASSUME CONTROL OF ANY TIER THREE INCIDENT OCCURRING WITHIN LEBANON'S AREA OF JURISDICTION. TO ASSIST IT IN ITS TASK, MoEW WILL CONVENE AN EMERGENCY RESPONSE COMMITTEE TO PROVIDE RELEVANT ASSISTANCE AND ADVICE.

4.2. Tier One Oil Pollution Emergency Plans

The Tier One oil pollution emergency plans form the foundation of the National Contingency Plan. It is likely that they will provide the first response in over 80% of oil pollution incidents. They will be site specific plans and will necessarily vary depending on the type and location of the facility concerned. Further information on what will be required of the different facilities is given below.

4.2.1 Offshore oil and gas exploration and production facilities

Offshore oil and gas exploration and production facilities present the risk of oil pollution as a result of blow-outs, rupture of pipelines, accidental or illegal discharges from production water or oil based mud systems, cargo transfer malfunctions or marine incidents such as collisions with passing shipping.

The MoEW will work closely with the petroleum sector to ensure that all operators of offshore units within Lebanon's area of jurisdiction prepare or update their oil pollution emergency plans for each facility, in accordance with Article 3(2) of the OPRC Convention. Such emergency plans must be compatible with Lebanon's National Contingency Plan and consequently will be subject to inspection by and the approval of MoEW.

Responsibility for responding to oil pollution originating from an offshore facility rests with the operator concerned who must immediately notify MoEW of the circumstances of the incident and the action taken in accordance with the agreed notification procedures (Section 3). Such notification is additional to any notification requirements which may be agreed within the petroleum sector.

Depending on the circumstances, e.g. size of the spill and resources at risk, MoEW will either:

- leave control of the response action to the operator concerned, or
- In exceptional circumstances, will itself assume command of the response action.

(Further advice on the policy for initial response to a Tier Two incident in the petroleum sector is contained below).

The appropriate response action will, to the greatest extent possible, be elaborated in advance in the context of the facility's own oil pollution emergency plan.

4.2.2 Onshore oil handling facilities

Onshore oil handling facilities fall into various categories: pipeline operators, oil terminals, refineries. The risk of oil pollution varies according to the activity. In the case of pipeline operators and oil terminals, the major risk will be from mistakes in oil handling operations or ruptures of the equipment. In the case of refineries, oily discharges may occur as a result of poor controls and inadequate environmental management procedures. Generally speaking, such incidents will result in small spills.

Responsibility for responding to oil pollution incidents at onshore oil handling facilities will rest with the operators concerned, who must immediately notify MoEW of the circumstances of any incident and the action taken in accordance with the agreed notification procedures (see Section 3). Such notification is additional to any notification requirements which may be agreed within the petroleum sector.

4.2.3 Sea ports

Sea ports represent an oil pollution risk from the various shipping related activities which take place within the approaches to and the confines of a port. Oil pollution may arise following collisions, cargo transfer activities, deballasting operations, or illegal discharges. By the nature of their activities, ports frequently suffer from pollution events. However, in most incidents, the quantity of the oil spilled is relatively small (less than 7 tonnes).

The MoEW will work closely with the Ministry of Public Works and Transport (MoPWT) and port authorities to ensure that all necessary facilities within Lebanon prepare or update their oil pollution emergency plans, in accordance with Article 3(3) of the OPRC Convention. Such emergency plans must be compatible with Lebanon's National Contingency Plan and will be subject to inspection by and the approval of MoEW.

Responsibility for responding to oil pollution within the jurisdiction of a port authority will rest with that authority. The port authority must immediately notify MoEW of the circumstances of the incident and the action taken in accordance with the agreed notification procedures (see Section 3).

In most cases (because of the small spill size), MoEW will leave control of the response action to the port authority concerned. However, if the size of the spill is sufficiently large to require external assistance, the port authority should request MoEW to assume command of the coordinated response required. The conditions under which responsibility is transferred from the port authority to MoEW will be described in detail in each port's own oil pollution emergency plan.

4.2.4 Shipping

The majority of ship-generated oil pollution is small scale. Apart from operations in ports (covered above), there are illegal discharges of bunker oil from all kinds of vessels and illegal cleaning of the cargo tanks of oil tankers. Occasionally such discharges may be accidental in origin.

The appropriate response to such incidents will depend on the location of the spill (e.g. whether environmentally sensitive resources are at risk) and its size. Responsibility for surveillance of the spill will, in most cases, rest with the nearest port authority or the nearest petroleum sector production unit. The results of the surveillance will be reported to the MoEW (see Section 3) who will determine the appropriate response action.

The costs of any combating or clean-up action will, in the first instance, be paid out of the Environmental Protection Fund. Where evidence is available, action will be taken by the Government of Lebanon to prosecute the offender to apply penalties and recover the costs of clean-up action and any other claims that may arise.

MoEW, in co-operation with the Ministry of Public Works and Transport, will take action to require that:

- all ships entitled to fly the flag of the Arab Republic of Lebanon and
- all ships in Lebanese ports or at an offshore terminal under the jurisdiction of the Government of Lebanon shall have on board a shipboard oil pollution emergency plan, in accordance with Article 6(3) of the OPRC Convention. Such shipboard oil pollution emergency plans shall be as required by and in accordance with the provisions adopted by IMO for this purpose (this refers to regulation 26 of Annex I of MARPOL 73/78, as amended). Such ships will be subject to inspections by officers duly authorised for that purpose in accordance with procedures to be determined by the Government of Lebanon.

4.3. Tier Two contingency plans

4.2.5 Local Contingency Plans

It is evident that, although many oil pollution incidents in Lebanon will be source-related and will therefore be governed by the responsibilities for initial response and subsequent change of command described in Section 5, there will be occasions when the source of the incident is not identified or when the geographical location of the observed oil spill is outside the defined area of responsibility of the port authorities or the petroleum sector.

In such cases - when there is no authority charged with initial response under site specific oil pollution emergency plans - responsibility for mounting surveillance of and response to an oil pollution incident will rest with MoEW, or other authorities designated to act on MoEW's behalf. In such circumstances, MoEW will be responsible, both for directing at sea operations and coordinating the shoreline response. In fulfilling this role, MoEW is likely to call upon the assistance of neighbouring facilities with oil spill combating equipment and strike teams. In some circumstances, MoEW may delegate its authority for mounting the at-sea response operation to a nearby facility. In such cases, the costs of mounting surveillance or response action will be reimbursed by MoEW out of the Environmental Protection Fund whenever such action has been specifically authorised and requested by MoEW.

In the longer term, it is the intention of MoEW to elaborate Local Contingency Plans to supplement the NCP and to provide more detailed policy and guidelines for coordinating response action in pre-defined geographical regions.

4.4. Tier Three: National Oil Spill Contingency Plan

Responsibility for coordinating the response to a major oil spill - in excess of 1,000 tonnes - will always fall to the MoEW. In most cases, oil spills of this size arise from accidents involving laden oil tankers.

Governments generally have recognised that it is not reasonably practical for owners of deep sea tankers - which voyage world-wide - to make contingency arrangements for dealing with oil spills wherever they may occur. Consequently, the Government of Lebanon has decided to accept the responsibility for dealing with spillages of oil at sea from shipping casualties which pose, or may pose, a threat to the marine environment, the Lebanese coastline or related interests. MoEW will coordinate the response action in such an incident, advised by experts on the Emergency Response Committee.

Compensation for the costs of combating and clean-up following such incidents will be reclaimed from the polluter either through the vessel's insurers or through Lebanon's present and intended membership of the relevant international conventions.

4.5. Transfer Of Incident Command

Guidance on when responsibility for coordinating the response action shall pass from an oil handling company or a port authority to MoEW is contained above.

5. INCIDENT COMMAND PROCEDURES

All reports of oil pollution should be notified to the MoEW using the standard OILPOL format (Appendix A.1).

The MoEW has established an Oil Spill Response and Communications Centre at XXXX which is manned on a 24-hours basis. The MoEW as established Internal Response Procedures which will be activated in the event of an incident.

MoEW's functions of overall command in a Tier Two or Tier Three oil pollution incident will normally be exercised from MoEW's Central Oil Spill Response and Communications Centre. When information is received of a major incident, the MoEW staff (which are on 24-hour duty) will arrange with the MoEW switchboard for all telephone calls relating to the incident to be transferred to the Oil Spill Response and Communications Centre.

5.1. Tier One Incident Command

The Incident Commander in a Tier One oil pollution incident will be the On Scene Commander designated in the local oil pollution emergency plan of the respective port authority, oil handling facility or offshore installation at which the incident originates.

They will be responsible for managing the response to the incident, and reporting to MoEW, in accordance with the Initial Response Procedures of this Contingency Plan (Section 4).

5.2. Tier Two Incident Command

The Incident Commander in a Tier Two oil pollution incident will be the Chief Executive of MoEW's designated representative (DR).

The DR will coordinate the national response to the incident from the MoEW headquarters. He will designate an On Scene Commander (OSC) to take charge of the response actions at the scene of the incident. The DR may request public and private authorities to provide prompt assistance and support in order to combat the oil pollution incident.

In the case of an incident which has originated within the area of responsibility of a local oil pollution emergency plan but has escalated beyond the capability of that facility to respond from its own resources, the DR will normally designate the local OSC to continue to direct operations for combating the pollution at sea and preparing shoreline protection. The DR will be responsible for mobilising additional resources from within Lebanon to be placed at the disposal of the OSC.

In the case of an oil pollution incident of unknown origin which has been reported to MoEW, the DR will normally designate the facility nearest the scene of the observed pollution to respond to the spill and nominate its local OSC to direct counter pollution operations.

5.3. Tier Three Incident Command

The Incident Commander in a Tier Three oil pollution incident will be the Chief Executive of MoEW or, his designated representative.

In particular, the Incident Commander will be responsible for taking the decisions to mobilise resources (personnel and equipment) from outside Lebanon, either from neighbouring

countries in the context of Lebanon's membership of international co-operation agreements or, in close consultation with the petroleum sector in Lebanon, from the oil industry's stockpile of equipment based at Southampton, UK.

The Incident Commander will be responsible for briefing the Minister of Energy and Water and the Minister of Environment for all political ramifications of the incident. Ministers will not have an operational role.

The Incident Commander will chair the meetings of the Emergency Response Committee which will always be convened in the event of a Tier Three oil pollution incident.

5.4. MoEW Liaison Officer

A major incident (Tier Two or Tier Three) may require a professional member of MoEW's staff to locate to the scene of the incident and act as a liaison officer. The function of this liaison officer will be to advise the OSC and act as MoEW's representative at the scene of the incident. It will **not** be the duty of this liaison officer to usurp the role and responsibilities of the OSC; nor, unless specifically designated to do so, to act as the DR.

6. NATIONAL COMBAT STRATEGY

6.1. The Fate Of Oil Spilled At Sea

When oil is spilt on the surface of the sea it undergoes a series of changes which are collectively known as weathering. The following summarise the characteristics of weathering for the purposes of defining the national combat strategy. (For further information refer to Appendix B).

Most oils will initially spread rapidly. The rate of spread will be determined by the volume of oil spilt and the rate of its release. A large, sudden release of oil will spread more rapidly than a slow seepage. In the longer term, the rate of spread and the thickness of the oil film will be determined by the type of oil. The area of sea affected can be considerable as theoretically the oil will spread until its thickness is about 0.1 mm or less, depending on the pour point and viscosity of the weathered oil. This means that a spill of 1 tonne of oil will eventually result in a slick covering 14,000 m2 (equivalent to a circle with a diameter of 130 m). In contrast, some oils which are carried in tankers as heated cargoes or waxy crude oils may solidify in contact with the sea and relatively thick layers of oil, or even lumps, may occur.

As the oil spreads, the lighter fractions evaporate, causing the viscosity of the oil to increase. During the process of evaporation and spreading, many oils will absorb sea water and, through wave action, this forms a viscous water-in-oil emulsion known as “chocolate mousse”.

Some of the spilt oil will disperse naturally and the rate at which this occurs will depend on the oil type and the sea state. For example, light oils in heavy seas may disperse completely in a few days. Conversely, viscous oils, or those which form viscous emulsions when weathered, will not disperse to any great extent and may persist on the sea surface for weeks.

Evaluation of these factors, and in particular the properties of the oil which has been spilled, will all have to be taken into account by the On-Scene Commander when deciding the most appropriate response action in an individual case. Nevertheless, certain broad statements concerning Lebanon’s national combat strategy can be made.

6.2. Combat Strategy

The national combat strategy will be based on the following principles:

1. Terminate or reduce the outflow of oil from the source.
2. Where marine or coastal resources are not threatened, monitor the oil slick.
3. Attempt control and recovery of the oil at sea by use of mechanical means.
4. Apply dispersants only in accordance with the national policy for dispersant use.
5. Protect sensitive areas according to the priority ranking of the NCP.
6. Shoreline clean-up.

6.2.6 Action to terminate or reduce the outflow of oil from the source

The first priority of a ship's captain or the operator of an offshore or onshore oil handling facility must be to terminate the outflow of oil as rapidly as possible. In the case of offshore installations or oil terminals, it is the responsibility of operators:

- to identify the likely sources of oil pollution incidents in their operations and quantify the "most likely" and "worst case" spill scenarios in their Tier One oil pollution emergency plans;
- to ensure that the most efficient equipment is installed and environmental management systems are in place to minimise the likelihood of incidents occurring and in order to reduce their impact if they do occur.

The objective must be to recover the oil as close to the discharge source as possible in order to prevent widespread dispersal and to ensure maximum recovery.

6.2.7 Monitoring the oil slick where marine or coastal resources are not threatened

If no marine or coastal resources are threatened, the decision may be taken to leave the oil to disperse naturally. This is only an option where vessel-source pollution is involved or an oil slick is observed where the pollution source is unknown. Responsibility for monitoring and coordinating the response to such incidents rests with MoEW.

6.2.8 Mechanical recovery of oil at sea

As a general principle, the mechanical recovery of oil at sea is the most favoured response action on the grounds that it causes the least damage to the environment. However, the feasibility of recovering oil by mechanical means will depend on the type and amount of recovery equipment available, weather conditions, the nature of the oil (e.g. its viscosity), as well as local conditions such as ease of access or the presence of debris. In practice, mechanical recovery will only be worthwhile if the depth of the oil layer can be increased by containing the spillage by the use of booms, thereby allowing equipment to operate at acceptable recovery rates.

6.2.9 Application of dispersants

Natural dispersion is a slow process and cannot be relied upon to remove the threat from large oil slicks. The process can, however, be accelerated by the addition of certain chemicals (dispersants) to the oil. The dispersants work in two ways: they speed up the rate at which small droplets are formed in the water column and they reduce the tendency for the droplets to re-combine and rejoin the slick.

The process of weathering affects both the ability of oil to disperse naturally into the sea and the effectiveness of dispersants. The onset of resistance to dispersion could appear within hours of release or could be delayed by one or more days. As a general rule, fresh, free-flowing crude oils disperse most easily. However, chemical dispersion becomes increasingly difficult, if not impossible, with weathering. (Colour can be a useful indicator of weathering: fresh oil is black whereas emulsions are usually brown, orange or yellow). Most oils form emulsions which are not amenable to dispersants after about 48 hours.

It is often not possible to apply dispersants to some of the medium grades or any of the heavy grades of fuel oils. Such oils are viscous even when fresh and dispersants will have no

effect. These oils will not spread over the surface of the sea but will form sharply defined patches or lumps.

Attempts should not be made to use dispersants on irridescent oil sheens. Such slicks are extremely thin and attempts to apply dispersants will result in excessive overdosing. Although a nuisance because of their appearance and smell, such slicks are harmless and will disappear rapidly in moderate to rough weather. In ports and harbours they will be broken up by normal shipping activity.

Because dispersing oil plumes are hazardous to marine life, and dispersants can themselves damage marine organisms if not used appropriately, the use of dispersants will be strictly controlled by MoEW under the NCP. The approved policy governing the use of dispersants in Lebanese waters is contained in Section 7 and prior approval will have to be obtained from MoEW for their use either as a "standing approval" issued to a port authority or operator or on a case by case basis.

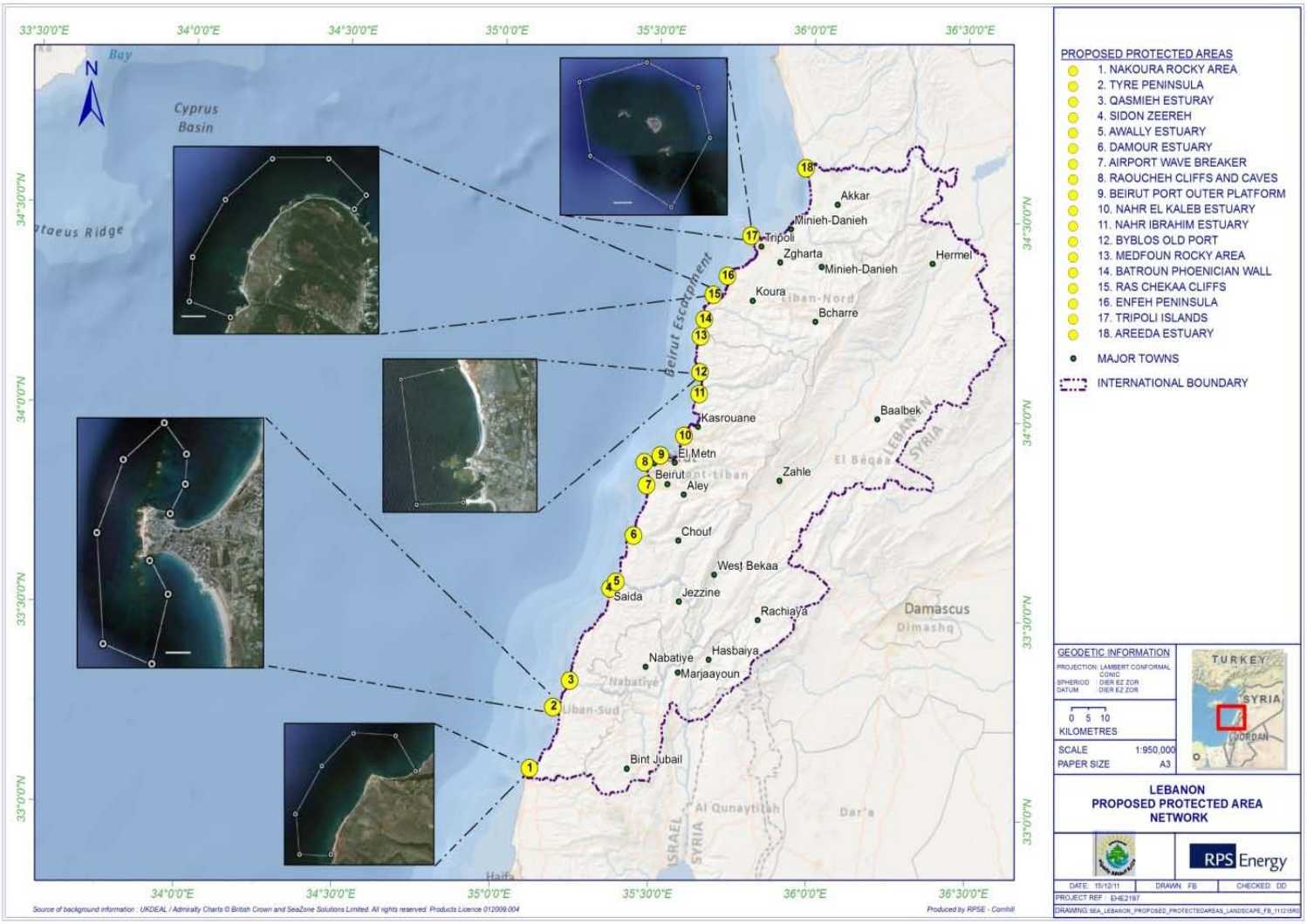
6.2.10 Protection of sensitive areas and species

Surveys of the entire Lebanese coastline have been carried out with the purpose of identifying areas of ecological sensitivity that should become official Marine Protected Areas (MPAs). The locations of these near shore and estuarine habitats are indicated on the map below (Figure 6.1). Areas of economic importance should also be identified and coastline categorised into areas of high, medium and low sensitivity as an aid to contingency planning.

Such a ranking system should be used as the basis for identifying appropriate protection strategies, including the provision of adequate and appropriate equipment and trained personnel. Further work may then be needed to identify those areas where floating booms or shoreline barriers could be used to good effect. This is likely to involve detailed current studies. Where it can be shown that booms can be deployed successfully, consideration could be given to installing fixed boom mooring points in order to protect highly sensitive areas.

Detailed work on biodiversity and protected species will be a component of the Environmental and Social Impact Assessments carried out during the development of oil and gas activities, and this data should be incorporated into the contingency planning.

Figure 6.1 Ecologically sensitive areas and potential Marine Protected Areas (MPAs).



6.2.11 *Shoreline Clean-Up Resources*

The priority of the national combat strategy is to deal with the oil at sea, preferably by mechanical recovery means but, where appropriate, by the use of chemical dispersants. The cost and length of time taken to complete beach cleaning and the time for recovery of the coastal environment will all be lessened if the spillage can be dealt with while still on the water.

Nevertheless, it is inevitable that in many cases oil spills will reach the shore. In such cases, it is highly desirable to minimise the amount of oil that reaches the shore and to limit the area of coastline affected. Where feasible, floating oil will be deflected to parts of the coastline where beach clean-up activities can be managed more successfully in order to protect more sensitive resources.

Responsibility for dealing with oil pollution when it reaches the shoreline will rest primarily with MoEW, assisted by the coastal governorates. The basis for MoEW's leading role is the Ministry's overall responsibility for Energy and Water plus its authority to mobilise the

necessary clean-up resources. In conjunction with the MoE the MoEW will determine the appropriate beach clean-up action, depending on factors such as the beach type, its ecological sensitivity, means of access, etc. The governorates will assist to the greatest extent possible in allocating manpower, vehicles and beach clean-up equipment. The governorates will also be responsible for determining the sites for disposal of used oil which is not capable of being delivered to a refinery for treatment.

When the arrangements for drawing upon the Environmental Protection Fund have been established, all oil pollution reaching the shore will be cleaned up and the costs reimbursed from the Fund in the first instance. Where appropriate, the Government will recover the costs from the polluter or through the mechanism of the international compensation funds. MoEW will be responsible for controlling access to the Fund's resources.

6.2.12 Policy Towards Clean-Up Of Existing Oil Polluted Coastline

Site surveys have shown that there are extensive stretches of the Lebanon coastline which have been adversely affected by long-term oil pollution. It will be MoEW's intention to initiate an action plan, in cooperation with the petroleum sector, to remediate the affected coastline.

6.2.13 Response Times

All owners of oil spill combating equipment, vessels and strike teams should have the capability to mobilise such resources within one hour.

It is the intention of MoEW to ensure that an appropriate level of response systems are in place in order to mount an effective response to an oil pollution incident commensurate with the risk. For high risk areas, the aim will be to establish a response time (= mobilisation time + sailing time) of 3 hours. For low risk areas, lower response times will be aimed for. All parts of the Lebanese coastline should be accessible within a response time of 24 hours.

7. POLICY ON THE USE OF DISPERSANTS

7.1. National Combat Strategy

As a general principle, mechanical containment and recovery of oil at sea is the most favoured response action on the grounds that it causes the least damage to the environment. However, it is also the option most limited by wind, current and sea conditions. In some cases, therefore, the application of dispersants may be a viable response option. The following paragraphs define those circumstances and conditions under which the use of dispersants will be allowed in Lebanese coastal waters and clarifies those situations when dispersant use will be prohibited.

Table 7.1 Advantages and Disadvantages of Using Dispersants

Some of the advantages and disadvantages of using dispersants in oil spill response are listed below.

ADVANTAGES	DISADVANTAGES
In contrast to containment and mechanical recovery, dispersants can be used in stronger currents and greater sea states.	By introducing the oil into the water column, the process may adversely affect some marine organisms which would not otherwise be reached by oil.
Dispersants are often the quickest response method.	If dispersion of oil is not achieved, the effectiveness of other response methods on oil treated by dispersants *may* decrease.
By removing the oil from the surface, dispersants help to stop the wind effect on the oil slick's movement that may otherwise push the surface slick towards the shoreline.	Dispersants are not effective on all types of oil under all conditions.
Use of dispersants reduces the possibility of contamination of sea birds and mammals.	There is a limited time window when dispersants can be used effectively.
Dispersants inhibit the formation of water-in-oil emulsions ("chocolate mousse").	If used on shore, dispersants may increase the penetration of oil into the sediments.
Dispersants increase the surface area of oil that is available for natural degradation.	Use of dispersants introduces an additional quantity of extraneous substances into the marine environment.

7.2. Net Environmental Benefit

MoEW needs to be satisfied that the use of dispersants will give the greatest overall benefit to the environment compared with other response options. In order to carry out such a net environmental benefit analysis.

The environmental effects of dispersed oil versus untreated oil for each area have been analysed on the basis of recorded international field experiments comparing chemically dispersed and untreated oil. The conclusions which form the basis of MoEW's policy on dispersant use are summarised below for each ecological resource and economic activity (listed in alphabetical order).

Aquaculture

It is undesirable for either untreated oil or dispersed oil to enter aquaculture ponds because of the risk of tainting fish products which can result in serious economic consequences. Access can be temporarily shut off by closing pipes or sluice gates and the oil spill response should concentrate on removing oil from near the water intakes as quickly as possible.

The priority should be for mechanical recovery but dispersant spraying may be an option provided that there is good potential for rapid dilution and removal of dispersed oil by water movements.

Birds

It is clear that the oiling of birds is disastrous for them, either because the oil destroys the insulating and water repelling properties of their plumage, or because of the toxic effects of the ingestion of oil, or because of the indirect effects of the destruction of habitats or food resources. However, the susceptibility of various groups of birds differs considerably. It is generally assumed that dispersion of oil slicks must be beneficial because it reduces the risk of direct fouling and the risk of birds ingesting oil. However, it is also known that dispersants increase the “wettability” of feathers which can lead to death by hypothermia. This suggests that direct accidental spraying of wildlife with undiluted dispersants will be harmful.

As a general rule, dispersant spraying will not be allowed in areas of national and international importance for birds. However, decisions will be taken by MoEW on a case by case basis taking into account all the relevant factors including the season of the year.

Deepwater Coral

Coral reefs are highly productive areas which support a diverse group of organisms, including many commercial fish species. They can be associated with commercially important dive sites. Coral reefs are easily damaged if oiled, may take several decades to recover if killed, and are difficult or impossible to clean.

The susceptibility of coral reefs to oil damage depends on a number of factors: e.g. size of spill, type of oil, type and depth of coral reef, the local wave energy, the current stress of the corals, etc. In many cases oil slicks will float over reefs without causing damage to the submerged corals and associated organisms.

The use of dispersants will not be allowed in shallow water over and near coral reefs because this would increase the exposure of the corals to oil droplets in the water column.

Fish

There is no evidence that oil slicks floating in the open sea above free-swimming fish have ever caused declines in fish populations. The net environmental benefit of using dispersants in open water conditions is neutral: dispersant spraying will not provide any advantages for the fish but neither are there likely to be harmful effects if the dispersed oil is rapidly diluted in deep water. In shallow water, however, dispersed oil in the water column is more likely to reach concentrations where it may harm or taint fish, particularly young ones. Spawning areas are also vulnerable.

Dispersant spraying may be an option in open sea conditions. Dispersant spraying will not be allowed in shallow-water spawning and nursery areas.

Marine Mammals and Turtles

Turtles are vulnerable to oil, eggs laid in sandy beaches and juveniles swimming in surface waters being their most sensitive stages. Pinnipeds are vulnerable at their haul out and breeding sites.

Depending on the season and circumstances, dispersants will not be allowed close to known turtle nesting beaches because of the increased likelihood of oil being incorporated in sediments.

Ports and Harbours

Sea conditions in ports, harbours and docks in industrial areas are generally calm. Conditions are therefore relatively good for containment and physical removal of the oil. Furthermore, most oil spills in port areas will be of marine diesel (gas/oil), heavy fuel oil (e.g. bunker 6) or intermediates. Spills of gas/oil (commonly used in new vessels) will evaporate or disperse naturally; heavy fuel oils cannot be dispersed; and intermediate products will either evaporate or are not amenable to dispersion.

Dispersants will not usually be allowed within the confines of port areas. Dispersants should only be used in port areas subject to approval by MoEW, either on a "standing approval" or on a case by case basis. Consideration will be given to the use of dispersants in anchorage areas on a case by case basis.

Seagrass beds

Seagrass beds (Posidonia beds) are important nursery areas for reef fish and shrimps and are also feeding grounds for many fish. The Green Turtle (an species classified as Endangered) feeds mainly on seagrass. Seagrass beds occur both inter tidally and in shallow sub-tidal areas. Seagrass beds have not been mapped in Lebanon but the occurrence of seagrass beds has been noted.

There is a possibility that dispersed oil in the water column could affect submerged seagrasses more than oil slicks floating on the surface above.

Dispersants will not be allowed in the vicinity of seagrass beds in shallow waters.

Shellfish

Oil slicks floating above shellfish areas are unlikely to harm them but exposure to oil - and possible tainting - are likely to increase if dispersed oil enters the water column.

Dispersant application will not be allowed for the treatment of oil slicks in near-shore waters with shellfishery activities.

Tourist resources and amenity areas

Recreational areas, such as bathing beaches and boat marinas, are important economically. Such areas are usually of low importance from the biological point of view.

The appropriate response option, including the use of dispersants, will be evaluated by MoEW on a case by case basis.

Water intakes

Water intakes for desalination plants or cooling systems for power stations or refineries may be damaged by the intake of oil-contaminated water. The use of dispersants close to water intakes of industrial facilities will increase the risk of oil passing under protective booms and entering the water intakes.

The use of dispersants will not be allowed within the vicinity of water intakes.

Summary

A summary of MoEW's policy on the use of dispersants, based on its net environmental benefit analysis, is set out in Table 7.2. All those responsible for preparing Tier One Oil Pollution Emergency Plans must take this policy and the Guidelines for the Use of Dispersants in Lebanon's Marine Waters into account in preparing or revising their own Tier One plans.

Table 7.2: Summary of the acceptability of the use of dispersants

Resource at risk	Acceptability of dispersants	Resource at risk	Acceptability of dispersants
Aquaculture	Case by case	Ports and harbours Anchorage areas	Generally no but case by case basis Case by case
Bird areas	Generally no but case by case basis	Seagrass beds	No
Coral reefs	No	Shellfish beds	No
Fishing grounds Spawning grounds	Open sea: case by case No	Tourist resources	Case by case
Turtles and Marine mammal breeding sites	No	Water intakes	No

7.3. Prior Approval By MoEW For the Use of Dispersants

The guidelines described above set out MoEW's policy governing the use of dispersants in specific situations. In some cases, it will still be necessary for MoEW to take a specific decision in each case depending on the actual circumstances. There will also be other occasions - not covered by the above guidelines or by specific derogations for Tier One Oil Pollution Emergency Plans - where it will be necessary for MoEW to give specific approval before dispersants may be used.

A decision tree which MoEW will follow when assessing whether dispersants may be used on a case by case basis can be found in Appendix C.3. The same decision tree should be used by operators when assessing whether to use dispersants in a particular spill, **even when** MoEW has given a "standing approval" for dispersant use in a Tier One Oil Pollution Emergency Plan (see below).

The aim of MoEW's spill response strategy as regards the use of dispersants is to reduce the overall environmental impact on both natural and economic resources. Despite the principles outlined above, several elements of the net environmental benefit analysis for a particular area are spill-specific and can only be assessed at the time of the spill. Factors such as the predicted trajectory of the slick, the corresponding fate of the spill, and an assessment of the comparative effects of untreated versus dispersed oil will all need to be taken into account in order to identify which spill response method will minimise the overall environmental impact.

A decision checklist which MoEW will follow is at Appendix C.9.

7.4. Water Depth Limits And Distance From the Shoreline

In addition to the areas where dispersants will not be allowed as a response option (Table 7.2), MoEW will also impose a general depth limit.

A number of field studies on the fate of oil and dispersed oil have been carried out internationally. These indicate that hydrocarbon concentrations beneath **untreated** oil slicks measure in the ppb (parts per billion). Under **dispersed** oil slicks, concentrations can be 20 - 50 ppm (parts per million) in the top 5 metres and at depths below approximately 10 metres hydrocarbon concentrations are < 1 ppm.

Mesocosm experiments indicate that the most significant effect of dispersants is an immediate increase in the hydrocarbon exposure to plankton. Acute effects have been observed, but many experiments involved long exposure times. In the open sea, dispersed oil would be diluted much more rapidly than it was in these experiments.

The most useful field experiments on the consequences of dispersant use in intertidal and nearshore areas were three experiments performed in the early 1980s: on Baffin Island in the Canadian Arctic; at a small bay in Maine, USA; and in a tropical bay containing mangroves, seagrass beds and corals in Panama. In all three locations, both dispersed and untreated crude oils were released slightly offshore or intertidally and allowed to strand on the intertidal zone.

This is not the place for a full evaluation of these studies. However, as regards the impact of dispersed oil, in Maine and the Canadian Arctic initial impacts were higher in the presence of dispersed oil, but the effect was temporary and conditions returned to normal within one year. In the Panama experiment, the study concluded that there was little or no damage to the mangrove trees from dispersed oil after two years. However, corals, seagrasses and invertebrates were significantly affected by dispersed oil. After 10 years, the corals affected by dispersed oil had fully recovered.

In conclusion, it can be assumed that the use of dispersants will alter the fate of oil so that there is a greater initial effect in the water column than leaving the oil alone, and dispersed oil will also induce impacts in the nearshore subtidal zone.

In order to minimise environmental damage in shallow waters and the nearshore zone, MoEW will not generally allow the use of dispersants:

- in water depths less than 20 metres;
- within 1 nautical mile (1.852 km) of the coastline or an area where the use of dispersants is prohibited (excluding the 10 or 20 metre water depth limit).

However, MoEW reserves the right to assess each application to use dispersants on its merits.

Dispersant prohibition zones

All “dispersant prohibition zones” will be marked on maps as required.

7.5. Standing Approvals

Due to weathering of the oil, there is a short “window of opportunity” for effective dispersant spraying. Its duration depends on a number of factors, notably the oil type, but is generally in the order of 24 hours and rarely lasts beyond 2 or 3 days. Most oils (with the important exception of heavy crude oils and fuel oil) can be successfully treated with dispersants in the first 4 to 6 hours of a spill. In order that dispersant spraying can begin as

soon as possible, it is essential that the dispersant response option is decided quickly. In the case of On Scene Commanders acting within a Tier One Oil Pollution Emergency Plan, this means obtaining a pre-approval from MoEW.

MoEW will grant “standing approvals” to those responsible for preparing Tier One Oil Pollution Emergency Plans where it can be shown to the satisfaction of MoEW that dispersant spraying is a viable response option for the facility concerned. In considering applications for standing approvals, MoEW will take into account such factors as:

- the circumstances when dispersants will be used instead of the preferred option of containment and mechanical recovery;
- the environmental and economic resources which are threatened;
- the facility’s own risk assessment of the “most likely” and “worst case” scenarios;
- the type of oil likely to be spilled and its characteristics (especially its viscosity and pour point);
- the adequacy of approved dispersant stocks at the site and the means of delivery within the time frame for the anticipated spill scenario.

When MoEW is satisfied that the use of dispersants will be a viable response option within the context of a Tier One Oil Pollution Emergency Plan, it will issue a standing approval in writing to the facility concerned, including any conditions or limitations on the use of dispersants. This approval will specify the named dispersant which has been approved. All standing approvals will be valid for 5 years unless circumstances make a shorter period appropriate.

The assessment of applications for standing approvals will take into account any mutual assistance agreements, where such agreements exist. However, in such cases, all partners to the mutual assistance agreement must have individual standing approvals for named products. Furthermore, any response where dispersants may be used under a mutual assistance agreement must specify a single point of control (On Scene Commander) or have clearly defined procedures for nominating such a single point of control.

There must be a commitment to contact the MoEW as soon as possible during the incident, and to report back to them on the extent and efficacy of dispersant use once it is over. A typical report will include the following information (see Appendix A.3).

- name of organisation
- incident number
- date
- nature of spill
- location
- remedial action taken
- dispersant used (including volume)
- date of manufacture of the dispersant used
- when efficacy last tested (if applicable)

- comments on efficacy relating to incident
- other comments
- date of report
- time of report
- name of person making report.

If a facility has not received a standing approval from MoEW, it must apply to MoEW for specific permission in each case where it proposes to use dispersants.

The terms of MoEW's standing approval, or the absence of an approval, does not prevent the use of dispersants in *force* majeure situations where there is an immediate threat to human life or the safety of an offshore installation or vessel from, for example, fire or explosion.

7.6. Approval System for Dispersants

Only named products which have been specifically approved by MoEW may be used as dispersants in Lebanese waters.

MoEW intends to develop its own procedures for the testing of dispersants which will be approved for use in Lebanese waters. Subject to further development, these will be:

- an effectiveness test: a laboratory test to determine the proportion (or percentage) of test oil that is dispersed and retained in a water sample under carefully specified conditions;
- a toxicity test: a laboratory test focusing on the effects of the chemically dispersed oil compared with the effects of untreated or physically dispersed oil, ie in order to ensure that the relative toxicity of an oil: dispersant mixture is no greater than the toxicity of the oil alone.

Until such time as national test procedures are developed, or until internationally recognised test protocols are developed, MoEW will normally accept documentary evidence to show that a named product has passed a recognised test procedure for both effectiveness and toxicity in another country.

8. SENSITIVE AREAS: PRIORITIES FOR PROTECTION

8.1. Coral Reefs

Coral reefs are considered as priority areas for protection due to their very high species diversity, their uniqueness and their considerable economic importance for the tourist industry and fisheries.

Coral reefs are threatened by small chronic oil spills in particular, but larger acute oil spills may also affect coral reefs. Observed biological impacts of oil spills in reef areas range from mass mortality of fish and invertebrates to apparently no effects.

Generally oil floats over the reef. However oil components may come in contact with corals in a number of ways:

- Some reefs are periodically exposed to the air. Oil can come in contact with corals and cause severe damage on such reefs.
- Waves breaking on the reefs may create droplets of oil that are distributed into the water-column.
- Weathering processes cause oil to sink.
- Oil components can dissolve in water to some extent which exposes the corals to potentially toxic compounds. However, toxic concentrations are only encountered in the uppermost part of the water-column.
- Sand landing on an oil slick during sand storms can cause the oil to sink.
- The use of chemical oil dispersants will increase the dispersion of the oil into the water, thus increasing the potential for contact with the corals.

Coral in the East Mediterranean has not been adequately researched or mapped, although the indications are that deepwater coral is extensive and supports high biodiversity. Data will become available from the future baseline surveys that will be carried out during the Environmental and Social Impact Assessment Reports prior to oil and gas activities.

Table 8.1 Coral Reefs ranked with respect to sensitivity to Oil spills.

Degree of vulnerability	Reef Type
Very vulnerable reefs	A. Reefs on very shallow water where the reef edge and reef flats may be exposed to air during low tide. There is a high risk of direct contact between corals and oil and the reef can be severely damaged.
	B: Reefs in sheltered shallow waters where high concentrations of dissolved oil may persist for quite a long time.
	C. Reefs on shallow waters which are already stressed by pollution, sedimentation, tourism etc
Reefs of medium vulnerability	Reefs on shallow water. High concentrations of dissolved toxic oil components may be encountered in the water around the corals beneath large fresh oil slicks on such reefs.
Reefs of low vulnerability	Reefs on deeper waters. Oil floats over the reef and dilution reduces oil concentrations around the corals to below acute toxic levels.

8.2. Vemetid Reefs

Vermetid reefs are biogenic platforms situated at intertidal level and built by attached marine snails. They are critically endangered structures in the Mediterranean, being found almost exclusively on the Levant coast and in very few other localities. These platforms often run parallel to the coast and have an important role in protecting the coast from erosion. Vermetid reefs are vulnerable to pollution events such as oil spills.

Their location should be mapped and included in the Sensitive Area map of the National Contingency Plan.

8.3. Seagrass Beds

Seagrass beds, or meadows, (Cymodocea nodosa and Posidonia oceanica) provide important habitat, especially as breeding, feeding, and resting areas for numerous marine species, particularly fish, crustaceans, and marine turtles. They are an essential food source for the Endangered Green Turtle. These beds produce more than 80% of the annual fish yield in the Mediterranean; the grasses also stabilise the seashore and maintain water quality, particularly through oxygen production.

Seagrass beds are typically nearshore habitats, and as such are vulnerable to degradation from anthropogenic activity. The use of chemical oil dispersants will increase the dispersion of the oil into the water, thus increasing the potential for contact with the seagrass beds. There has been no distribution mapping of seagrass beds in Lebanese waters; however, data will become available from the future baseline surveys that will be carried out during the Environmental and Social Impact Assessment Reports prior to oil and gas activities.

8.4. Bird Sites

Water-birds are perhaps the most prominent victims of oil spills at sea. There are three types of effects:

- Effects caused by the sticky nature of oil. Stains of oil on the plumage may destroy the insulating and water repelling property which may ultimately cause the death of the bird.
- Toxic effects after the ingestion of oil during preening, ingestion of oiled prey, inhalation of oil fumes or absorption of oil through skin or eggs.
- Indirect effects resulting from destruction of bird habitats or food resources.

The sensitivity to oil for various groups of birds differs considerably. Table 8.2 gives a ranking of the vulnerability to oil spills of various groups of water birds.

The risk of oil pollution to bird species not normally associated with water is, of course, much lower than that of water-birds. However, certain migrating non-water birds, such as birds of prey and storks, can be affected. During migration birds often land to rest along the shoreline or to soak their feet in the tidal zone to cool down.

There is no recorded data on habitat use, habitat location or seasonal sensitivity for the birds known to use Lebanese waters, nor are the precise migratory routes mapped. Data will become available from the future baseline surveys that will be carried out during the

Environmental and Social Impact Assessment Reports prior to oil and gas activities and it is essential that this information is fed back into the National Contingency Plan.

Table 8.2 Water Birds ranked with respect to sensitivity to Oil spills

Vulnerability to oil	Group	Remarks
High vulnerability	**Diving coastal birds** Diving ducks, Petrels, Shearwaters, Grebes	These birds stay on the water most of the time. The risk of contact with oil-slicks is high and the birds do not avoid oiled areas. Direct mortality from oil slicks can be very high.
	Waterfowl Dabbling ducks	Dabbling ducks also stay on the water and are therefore highly at risk but they are less vulnerable than diving birds because they prefer shallow habitats with a reduced risk of spill occurrence (Such as the Mediterranean coastal lakes which are only connected to the sea via a few very narrow gaps.)
Moderate vulnerability	**Diving pelagic seabirds** Skuas	These birds do not spend much time on the water surface. Risk of direct mortality due to exposure to oil is therefore smaller. Effects on reproduction from oiling and ingestion of oil has occurred.
	Shorebirds	Shorebirds rarely enter the water. Risk of direct mortality during an oil spill is therefore generally low. Indirect effects from either reduced or contaminated prey are more likely because they feed in intertidal habitats where oil strands.
	Wading birds Herons	Do not immerse into the oil. However, wading birds feed in shallow areas which are usually oiled during a spill. Therefore indirect effects can occur from ingestion of oiled prey and from loss of food sources.
	Birds of Prey Eagles, ospreys, falcons	Birds of prey may become oiled via consumption of oiled prey.
Low vulnerability	**Gulls and terns**	Gulls and tern are able to readily avoid oil spills.

8.5. Turtles

Sea turtles are listed as globally threatened species and they are very sensitive to oil pollution. Nesting sites are particularly vulnerable and are therefore considered to be priority areas for protection.

Three species are known to breed in Lebanon: the Green Turtle (*Chelonia mydas*, the Leatherback Turtle *(Dermochelys coriacea)* and the Loggerhead Turtle (*Caretta caretta*). The status for these species is indicated in Table 8.3.

Table 8.3: Status of Sea Turtles in Lebanon

Species	IUCN Status*	Areas of importance to species
Green Turtle (*Chelona mydas*)	Endangered	Mediterranean
Loggerhead Turtle (*Caretta caretta*)	Endangered	Mediterranean
Leatherback Turtle *(Dermochelys coriacea)*	Critically Endangered	Mediterranean

* Globally threatened status as specified by the 1990 IUCN Red Data Book (WCMC 1990)

Endangered: Species in danger of extinction and whose survival is unlikely if the causal factors continue operating.

Critically Endangered: Extremely high risk of extinction in the wild.

Turtles lay their eggs on sandy beaches during summer. The peak nesting period is June-July. The females bury the eggs in the sand. The nests are normally located above the high tide level and the turtles prefer nesting on isolated beaches.

After a 50-70 day incubation period, hatchlings emerge and move rapidly to the sea. In the first period at sea, the juveniles stay in the pelagic zone where they are carried by the currents. Later the juveniles leave the pelagic and move to benthic foraging grounds.

Green turtles feed on sea-grasses and are consequently mainly found at sea-grass beds. Loggerheads are carnivorous, feeding on benthic species.

Turtles are vulnerable to oil, eggs and juveniles being the most sensitive stages.

The hatchlings are especially at risk when they dig their way out of the nest and enter the water. If oil is stranded on a nesting beach the juveniles inevitably have to cross an oiled part of the beach and they become smeared in oil. This may cause skin irritation and surface lesions which may weaken them. In severe cases they may die.

During their first period in the sea the young juveniles stay in surface waters and the risk of encounter with oil slicks is therefore high. Young turtles which have been exposed to oil in water may suffer from a wide number of injuries (disturbed diving and respiratory patterns, decreased blood glucose levels, reddening and sloughing off of the skin and dysfunctioning of the salt glands). These injuries may eventually cause the death of the animal.

The eggs are also very vulnerable to oil when buried in the sand. Fresh crude oil on the sand surface significantly affects the hatching success of eggs. If eggs are exposed to a light dosage of oil mixed in sand, the hatchlings become considerably smaller in terms of weight and size than normal. Fortunately, in cases of stranding of oil on the beach, direct oiling of eggs is not likely except during storms because the eggs are usually laid above the high tide mark.

Adults may experience skin irritation or surface lesions if coated with oil. They may also consume tar balls which coat their mouth hampering feeding ability.

Initial surveys along the Lebanese coast have shown that nesting was sparsely distributed along parts of the northern coast and scattered on several developed beaches, but the southern nesting sites were found to be more important both nationally and regionally. Loggerhead turtles (*Caretta caretta*) are widespread along the coast of Lebanon and high-density nesting can be observed at specific sites throughout the Lebanese coastal belt. The green turtle (*Chelonia mydas*) is far less common and nesting is confined to the less developed areas of the south.

It is expected that more detailed information on the location and migratory routes between nesting and feeding grounds will become available through detailed baseline surveys that will take place prior to oil and gas activities.

8.6. Marine Mammals

The east Mediterranean supports a diverse marine mammal fauna, including several species listed by the International Union for Conservation of Nature (IUCN) as endangered (e.g., Fin Whale) and vulnerable (e.g., Sperm Whale). Common species are likely to include the Bottlenose Dolphin, Common Dolphin, Risso's dolphin, and Striped Dolphin. The rare, critically endangered Mediterranean Monk Seal has been recorded in Lebanese waters.

Marine mammals are generally less affected by oil spills directly, however contamination and destruction of habitat and prey species leads to loss of weight, gut ulceration and a compromised immune system. Oil can disguise scent that seal pups and mothers rely on to identify each other, leading to rejection, abandonment and starvation of seal pups.

More detailed information on the presence, location and habitat use of marine mammals in Lebanese waters will be generated through detailed baseline surveys that will take place prior to oil and gas activities.

8.7. Fish

Oil components are toxic to fish. However, the toxicity varies a great deal with the life-stage of the fish:

- larvae are by far the most vulnerable;
- eggs are less sensitive and
- adults are the least vulnerable. In addition, adults are able to actively avoid oil slicks.

Generally, toxic concentrations of oil components are confined to the uppermost parts of the water column beneath an oil slick. Larvae, eggs, juveniles and adults at risk are those

encountered in the upper water masses. However, in cases where oil is actively dispersed by the application of dispersants, the risk of toxic effects in deeper water increases. In addition the toxicity increases.

8.8. Human Use Resources

8.8.1 Tourism

The tourism industry plays a vital role in the national economy of Lebanon and is planned to be significantly further developed.

An oil spill may cause economic loss to the tourism industry. Tourist areas have been given a high priority in the priority ranking for protection and clean-up, due to the great importance for the Lebanese economy.

Fortunately tourist beaches are usually easy to clean; they are generally composed of fine grained sand and good access roads to the beaches are available.

8.8.2 Aquaculture and fisheries

Information provided by the Ministry of Agriculture, indicates that there are approximately 2,662 marine fishing vessels, 44 fishing ports and landing sites and approximately 6,500 fishermen represented by 35 Cooperatives and seven syndicates.

There are no exact figures on seafood production in Lebanon, being approximately 8,000 tons from marine fishery, 1,000 tons from aquaculture, 19,337 tons imported, 109 tons exported. There are no regulations on offshore aquaculture.

Currently the only marine aquaculture farm is a shrimp, *Litopenaeus vannamei, farm* in Aabde: it produces 25 t/years with high potential and good quality.

Marine aquaculture is a promising endeavour. It continues to expand more rapidly than other sectors producing foods of animal origin. There are however major constraints and real threats to the development of aquaculture in Lebanon. These include competition for space with other coastal users; no organized planning of coastal zones; low level of production experience; and strong competition from imported fish and other food products.

In addition, on a marine ecosystem made already fragile by pollution and overfishing, climate changes could negatively impact both ecosystems and their resources.

8.8.3 Other Human Uses

An oil spill may cause damage in urban areas, harbours and ports. Oiling of seawater intakes of desalination plants will especially cause severe problems.

9. MEDIA RELATIONS PLAN

9.1. Objectives For Relations With The Media

MoEW recognises that in the event of a major (Tier Two or Tier Three) oil pollution incident there will be a lot of media interest, particularly if touristic or ecological resources are threatened. Environmental pressure groups may also be concerned.

MoEW 's policy aim is:

- to provide the media (radio, TV, newspapers) with honest and accurate information at regular intervals throughout the incident;
- to establish good relations with the media in order to ensure that the flow of information is controlled and the presentation of facts is not distorted.
- MoEW 's objectives for dealing with the media during an oil pollution incident will be:
- to establish the competent authorities as a helpful, reliable and knowledgeable source of information
- to present an efficient and environmentally caring face to the media
- to demonstrate a responsible approach and show that an efficient response strategy has been set in place
- to influence what the media write or say.

9.2. Appointment Of MoEW Media Liaison Officer

The Media Liaison Officer (MELO) will have important functions during an incident since, in most cases, he will be the "public face" of MoEW. It is recognised that responsibility for dealing with the media during a Tier Two or Tier Three incident should be managed by a separate officer as the Incident Commander will be too busily concerned with the practical arrangements of responding to the incident.

During an incident, the MELO will have:

- sole responsibility for handling the relations with the media;
- no responsibility for combat operations.

However, in order that he can fulfil his task effectively, it will be important that the MELO is closely involved with, and fully informed about, the combat response decisions. The MELO will therefore be a member of the core Incident Management Team.

APPOINTMENT OF A MEDIA LIAISON OFFICER AT THE SCENE OF THE INCIDENT

In the event of a major oil pollution incident, there will be a lot of pressure from the media on the authorities who are leading the response action at the scene of the incident to make statements about the reasons for the spill, the combat measures, etc. In order to ensure that conflicting views are not presented to the media, it will be important to present a unified approach, whether it is from MoEW or the authority on scene.

It is therefore essential that the locally appointed Media Liaison Officer should establish contact with the MELO at MoEW in order to ensure a consistency of approach before issuing press releases or conducting interviews with the media.

Further guidelines on the role and responsibilities of the Media Liaison Officer are given in Section 11.8.

Guidelines on how to handle publicity and relations with the media are given in Appendix G.

10. TRAINING AND EXERCISES

To meet its obligations under the OPRC Convention, Lebanon is obliged to establish a programme of training and exercises. Article 6(2) of OPRC states that "... each Party, within its capabilities either individually or through bilateral or multilateral co-operation and, as appropriate, in co-operation with the oil and shipping industries, port authorities and other relevant entities, shall establish a programme of exercises for oil pollution response organizations and training of relevant personnel."

10.1. Training

Training is an essential activity of MoEW's national contingency plan in order to enhance the capabilities of personnel working at different levels and in different organisations - both in the public and private sector - within Lebanon.

All personnel designated within the NCP must be trained to a minimum level of IMO Level II and must undertake refresher courses at periods of 3 years from the date of their original certificate. Such refresher courses shall be for the duration of 1 day, and will be held through an accredited training centre.

All courses will include the following oil spill response subjects at an appropriate level:-

- Assess situation
- Activate Contingency plan
- Develop a response action plan (Strategy)
- Assist in establishing & organising a response structure
- Assist in activating an operational response
- Activate an Operational Response
- Manage and control ongoing response
- Assist in the decisions to deactivate a response
- Debrief & report

10.2. Exercises

The ultimate test of any contingency plan is measured by its performance in a real oil pollution incident. It is vital that a programme for developing and strengthening the NCP should include an annual exercise programme to test the national contingency plan through realistic exercises. Those responsible for Tier One and Tier Two oil pollution emergency plans should also regularly conduct exercises for ensuring that personnel understand their responsibilities and that the operational procedures of the plan are effective and workable in a real emergency.

There are many benefits from conducting exercises regularly. Response teams are provided with the opportunity to practice skills that will be required in an oil pollution incident, to work together closely and develop personal relationships (sometimes with colleagues from different companies and organisations), and to make complex decisions under stressful circumstances. Contingency plans, equipment and operational procedures will be tested

and, with proper feedback, lessons will be learned and recommendations will be made for improvements to the oil spill response systems. This applies both to the national contingency plan and local (Tier One) oil pollution emergency plans.

Four different types of exercise can be identified: notification exercises, tabletop exercises, equipment deployment exercises and incident management exercises.

Notification exercises

Notification exercises test the procedures to alert and call out the response teams and are conducted through telephone, fax and other means of communication. They can be used to test communications systems, check the availability of personnel and the agreed emergency (24 hour) notification arrangements, and assess the ability to transmit information quickly and accurately. Such an exercise will typically last one or two hours and may be held at any time, day or night, and either announced in advance or held unannounced.

Tabletop exercises

Tabletop exercises normally consist of interactive discussions based on a simulated exercise scenario among the members of a response team, but they do not necessarily involve the mobilisation of personnel or equipment. They are usually conducted in a conference room or series of rooms connected by telephone lines. Tabletop exercises focus on the roles and actions of the individuals with specific tasks as defined in the contingency plan or local oil pollution emergency plan, the interactions between the various parties, and the development of response strategies. A tabletop exercise might typically last between half a day and a full day and should be organised in advance in order to ensure the availability of personnel.

Equipment deployment exercises

Equipment deployment exercises involve the deployment of oil spill response equipment at particular locations in response to an exercise scenario. Among other things, the aim is to test the response strategies in the plan for a particular oil spill scenario. These exercises test the capability of a local team to respond to a Tier One or Tier Two type incident. They provide experience of local conditions and of different spill scenarios, and they enhance individual skills and teamwork. It is important that all the parties who would normally be part of such a response, such as providers of boats, barges and trucks, should be involved so that their availabilities and capabilities can be assessed as a contribution to the effectiveness of the plan.

Equipment deployment exercises typically last for a whole day. Such exercises should be repeated frequently to ensure that response teams are familiar with the equipment and to ensure that practical skills are not forgotten. Equipment deployment exercises also provide a good opportunity to check that the condition and maintenance of equipment is in good working order. In some cases an equipment deployment exercise might be run in conjunction with a tabletop exercise or incident management exercise.

Incident management exercises

Incident management exercises are more complex in that they simulate several different aspects of an oil spill incident simultaneously and usually involve third parties outside the organisation which is being tested. Such an exercise may be of "limited scope" with organisations using their own personnel to role-play the main external parties. However, it is more beneficial for such exercises to be "full scope" when outside agencies and organisations are invited to play their own roles within the exercise. Although "limited scope" exercises are beneficial in the early stages of team development, it is only by exercising with the actual people who would be involved in a real emergency that a response team can be properly tested and trained.

Incident management exercises require significant planning in terms of availability of personnel, the development of an appropriate exercise scenario and the physical arrangements for staging such events, especially when combined with an equipment deployment exercise. Incident management exercises usually last one long day (typically 10 - 14 hours), followed by a debriefing session on the second day.

10.2.1 Planning Exercises

The National Contingency Planning Committee has agreed that MoEW should organise notification exercises at least every 3 months in order to ensure that the alert procedures of the NCP are understood and followed by all concerned parties.

The Committee has also agreed that, in addition to testing notification procedures, the readiness of parties to respond to an oil spill and mobilise equipment should also be tested on a regular basis. The Committee therefore agreed that MoEW should organise a national exercise every year and that each party playing a role in the exercise will bear its own costs. The national exercise will be a combination of an incident management exercise and an equipment deployment exercise.

All exercise communications shall carry the heading:

EXERCISE - EXERCISE - EXERCISE

to avoid any confusion with a real pollution incident.

All exercise communications must be acknowledged by the recipient.

Part B: Operational Procedures

11. RESPONSIBILITIES OF THE MEMBERS OF THE OIL SPILL RESPONSE TEAM

The following is a checklist of duties required of the MoEW oil spill response team. For ease of reference, it recalls the responsibilities of the Designated Representative in the event of a Tier Two or Tier Three oil pollution incident, as set out in Section 4. It also constitutes a checklist for organisations establishing their own local oil pollution emergency plans.

11.1. MoEW's Designated Representative

The MoEW's Designated Representative (DR) is the person may be appointed by MoEW to be the Incident Commander in a Tier Two oil pollution incident and to assist the Chief Executive of MoEW in a Tier Three oil pollution incident. He is responsible for nominating an On Scene Commander (OSC) to take command of response actions at the scene of the incident. The DR will coordinate the activities of the various organisations involved in the response action including the subsequent clean-up operations. The DR has overall decision making responsibility in a Tier Two incident and will be supported by appropriate operational, administrative and scientific personnel. Where necessary, the DR will convene the Emergency Response Committee to assist him in the decision making process.

The duties of the DR include:

MoEW DESIGNATED REPRESENTATIVE	
INITIAL ACTIONS	
❒	Assess the spill in the light of information received by telephone or the OILPOL reporting format, and define its potential impact and the probable spill area.
❒	Commence a chronological log of events
❒	Nominate an On Scene Commander to take command of response actions at the scene in a Tier Two or Tier Three incident.
	Activate the procedures for mobilising MoEW's resources and the Oil Spill Response Operations Room.
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	Consider requests for assistance from the OSC and to coordinate the mobilisation of additional resources (personnel and equipment) in accordance with the NCP.
❒	convene the Emergency Response Committee, if required
❒	Liaise with the OSC and take decisions which fall to MoEW to decide.
CLOSE-OUT ACTIONS	
❒	To decide when to scale down and/or terminate the response activity in consultation with the OSC. These decisions may be different for the marine and shoreline operations
❒	Request copies of all logs, reports and communications from all parties

❒	Prepare a report covering all aspects of the spill and response operation and submit to MoEW

11.2. On Scene Commander

The On Scene Commander (OSC) is the person named in the local oil pollution emergency plan, or is nominated by the NCP in the event of a Tier Two or Tier Three spill, to direct the overall response operation both at sea and on land. The OSC has overall decision making responsibility for the tactical response to an oil pollution incident and should be supported by appropriate operational, scientific and administrative personnel. The duties of the OSC are:

ON SCENE COMMANDER	
INITIAL ACTIONS	
❒	Obtain all available information regarding the spillage / pollution incident to assess the incident and define its potential impact and the probable spill area
❒	Commence a chronological log of events
❒	To determine the level of response and the scale of the response team required (the potential explosive and fire hazard should also be considered).
❒	To notify MoEW by telephone or fax in accordance with the NCP notification procedures and to keep MoEW informed of developments.
❒	If the origin of the spill is unknown, to arrange for the collection of samples for identification
❒	To appoint Team Leaders to take command of the response actions at sea and for shoreline protection respectively
❒	To set up an Emergency Operations Centre (EOC)
	Brief the team on the incident and their roles and responsibilities
❒	To initiate and direct response measures to stop and contain the spill and to recover oil (both within and outside containment areas).
❒	Mobilise & Assemble response equipment as required
❒	Ensure that all relevant initial notifications to statutory bodies have been or are being made.
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	To determine whether to use dispersants in accordance with the approved oil pollution emergency plan. If it is decided to use dispersants, and if prior approval has not been obtained from MoEW, it will be necessary to obtain MoEW's approval through the DR
❒	To activate the aerial application of dispersants if this is part of the response strategy.

❒	To arrange for shoreline protection measures if the spill is likely to impact the coastline.
❒	To ensure that the original spill area is recorded on a marine survey chart with date, time, wind velocity and direction, tides, and equipment mobilised (booms, vessels, etc). This chart should be updated as required.
❒	To arrange for survey of the spill area by marine or aerial observations, including photographic or video records.
❒	To arrange for a photographic record of: • the origin of the spill • the spill area • property damaged through the spill (boats, fishing nets, tourist amenities, etc) • impacted shorelines (beaches, rocks, walls, etc) • the EOC action boards • spill clean-up equipment in use This record may be needed as evidence in support of claims for compensation
❒	To initiate the appropriate level of documentation needed for effective cost recovery action. This will include the accurate logging of quantities of recovered oil and removed oily sand and beach material. The condition of all oil spill combating equipment should be known and recorded before the spill; the condition of the equipment on completion of the recovery operations should be recorded.
❒	To organise daily debriefing sessions with all key members of the response team.
❒	To ensure that situation reports (SITREPs) are provided at regular intervals (at least every 24 hours during response actions) and are transmitted by fax to MoEW.
❒	To ensure timely release of press notices through the Media Liaison Officer
❒	To prepare daily work plans, shift rosters for personnel, etc with the Team Leaders.
❒	Monitor the performance of the Team and identify the need for relief or additional personnel
❒	Review and approve all information for use by media response and human resources teams prior to external use.
CLOSE-OUT ACTIONS	
❒	To decide when to scale down and/or terminate the response activity. These decisions may be different for the marine and shoreline operations
❒	Request return of all logs, reports and communications from all parties
❒	To ensure cleaning up and return of equipment in good order.
❒	Notify all involved organisations of de-brief meeting time and location.
❒	To prepare a report covering all aspects of the spill and response operation and submit a copy to MoEW

11.3. Marine Team Leader

The Marine Team Leader (MTL) is responsible for all waterborne activities undertaken in connection with the spill. His tasks will be related to the containment of the oil at sea, the spraying of dispersants from vessels where this has been approved by MoEW, and the protection of the coastline by the deployment of booms. The duties of the MTL are:

MARINE TEAM LEADER	
INITIAL ACTIONS	
❒	Obtain all available information regarding the spillage / pollution incident to assess the incident and define its potential impact and the probable spill area
❒	Commence a chronological log of events
❒	To determine the level of response and the scale of the response team required (the potential explosive and fire hazard should also be considered).
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	To provide advice and recommendations to the OSC on offshore response tactics within the spill area.
❒	To make recommendations to the OSC on the appropriate vessels and offshore oil spill response equipment needed. This may require the OSC or the DR seeking assistance from other equipment stockpiles.
❒	To allocate boat crews and ensure the safety of personnel.
❒	To advise the OSC regularly on the progress of the offshore operations and make recommendations on developments as they occur.
❒	To ensure that adequate information is provided to the Administrative Supervisor who will maintain a documentary record of the spill.
❒	To prepare for refueling and servicing of equipment throughout the day and, after use, at night.
❒	To regularly check that the deployment of vessels and equipment is being used to best possible effect.
❒	To participate in the daily debriefing sessions
CLOSE-OUT ACTIONS	
❒	Initiate stand down of marine response when Instructed
❒	Request return of all logs, reports and communications from all marine parties
❒	Ensure incident report is prepared

11.4. Shore Team Leader

The Shore Team Leader (STL) is responsible for all activities undertaken on the foreshore for the protection of sensitive resources. He is also responsible for the coordination of shoreline

clean-up activities, including the temporary and ultimate disposal of collected oil and waste materials. The duties of the STL are:

SHORE TEAM LEADER	
INITIAL ACTIONS	
❒	Obtain all available information regarding the spillage / pollution incident to assess the incident and define its potential impact and the probable spill area
❒	Commence a chronological log of events
❒	To determine the level of response and the scale of the response team required (the potential explosive and fire hazard should also be considered).
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	To provide advice and recommendations to the OSC on foreshore response tactics within the area affected by the spill
❒	To make recommendations to the OSC on the appropriate shoreline clean-up equipment needed, including manpower resources. This may require the OSC or the DR seeking assistance from other equipment stockpiles and response teams.
❒	To organise shoreline clean-up teams and ensure the safety of personnel.
❒	To ensure that all clean-up measures are undertaken with environmental considerations in mind. This means taking into account any clean-up guidelines (including prohibited techniques) issued by MoEW.
❒	To ensure that temporary arrangements are made for the separate collection of oil which may be reprocessed and oil contaminated material.
❒	To arrange for the transfer of oil to a refinery for processing.
❒	To arrange for the final disposal of any oil contaminated material in consultation with MoEW and the coastal Governorate.
❒	To advise the OSC regularly on the progress of clean-up operations and make recommendations on developments as they occur.
❒	To ensure that adequate information is provided to the Administrative Supervisor who will maintain a documentary record of the spill.
❒	To prepare for refuelling and servicing of equipment throughout the day and, after use, at night.
❒	To regularly check that the deployment of personnel and equipment is being used to best possible effect.
❒	To participate in the daily debriefing sessions
CLOSE-OUT ACTIONS	
❒	Initiate stand down of Shoreline response when instructed
❒	Request return of all logs, reports and communications from all parties

❒	Ensure incident report is prepared

11.5. Administrative Supervisor

The Administrative Supervisor (AS) is responsible to the OSC for the provision of financial, record keeping, procurement and clerical services required in connection with the oil spill response. The AS will direct a team specifically tasked to provide clerical and administrative support. The size and complexity of the team will depend on the size and complexity of the spill. The AS will be required to set up an office with adequate staff and equipment at the EOC. In the event of a Tier Two or Tier Three spill which is under the overall command of the DR, the on-scene AS will need to liaise closely with the Finance Group at the Central Operations Room (COR) at MoEW. The duties of the AS are:

ADMINISTRATIVE SUPERVISOR	
ON-GOING ACTIONS	
❒	Maintain a chronological log of events. Record all details of incident, conversations and all incoming information. Ensure detailed documentation of all stages of the incident is maintained.
❒	Co-ordinate information flow within the team
❒	Maintain account of all manpower, equipment and materials used in the response.
❒	Receive all necessary information for record keeping purposes from the MTL and the STL
❒	Compile daily record sheets of the manpower resources and equipment used at **each** separate location where personnel and equipment are deployed.
❒	maintain the action boards in the EOC with updated information on personnel and equipment deployed, etc
❒	Consult the NCP for information on additional equipment and resources which may be available if requested.
❒	Arrange the delivery point for equipment and manpower resources brought in from outside.
❒	Arrange for the issue of all security passes and accommodation for assisting external personnel.
❒	Check the condition of equipment brought in from outside on arrival and arrange storage area.
❒	Arrange security protection for all equipment overnight where necessary.
❒	Ensure that all business agreements are formalised (purchases, hiring, leases, etc).
❒	Set up a system for processing claims for damages, taking account of any advice from MoEW.
❒	Obtain names and addresses of property owners affected by the spill (water frontages, boat owners, etc) and details of the damage incurred.

❒	Arrange entry to private or military property if required for shoreline protection or clean-up purposes.
❒	Ensure that adequate medical resources are on hand and that the locations of the nearest hospital and ambulance station are known.
❒	Arrange fresh water supplies, food and drink facilities for all combating personnel.
❒	Participate in the daily debriefing sessions.
CLOSE-OUT ACTIONS	
❒	Ensure that "lessons learned" profile is available quickly to allow for any necessary upgrade of procedures
❒	Request return of all personnel logs, incident reports, communications copies etc. This may be in the form of a collated report. All original documentation from all working location must be preserved.
❒	Ensure that a comprehensive report of the incident with chronological log of events, persons notified and all supporting documentation is prepared.

11.6. Communications Supervisor

The Communications Supervisor (CS) is responsible for the coordination of all communications aspects connected with the spill. The duties of the CS are:

COMMUNICATIONS SUPERVISOR	
ON-GOING ACTIONS	
❒	Obtain adequate communications equipment for distribution to personnel at sea and on shore and ensure that personnel know how to use them.
❒	appoint a VHF radio operator(s) at the EOC
❒	Ensure that effective communications links are maintained between the EOC and the on-scene coordination units.
❒	Transmit and receive all radio messages as required by EOC personnel.
❒	Ensure that all information is being logged.
❒	Set up a communications network board.
❒	Arrange radio battery replacement and overnight charging and repairs.
❒	Ensure that the EOC radio is manned during all marine and onshore operations.
❒	Participate in the daily debriefing sessions.
CLOSE-OUT ACTIONS	
❒	Ensure that "lessons learned" profile is available quickly to allow for any necessary upgrade of procedures
❒	Request return of all personnel logs, incident reports, communications copies etc. This may be in the form of a collated report. All original documentation from all working location must be preserved.

❒	Ensure that a comprehensive report of the incident with chronological log of events, persons notified and all supporting documentation is prepared.

11.7. Scientific Adviser

The Scientific Adviser (SA) is responsible for providing the OSC with scientific expertise in respect of environmental issues and priorities. The duties of the SA are:

SCIENTIFIC ADVISOR	
INITIAL ACTIONS	
❒	Obtain all available information regarding the spillage / pollution incident to assess the incident and define its potential impact and the probable spill area
❒	Commence a chronological log of events
❒	Assess the spill's potential impact on environmental resources.
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	Provide the OSC with a balanced assessment of environmental priorities within the area under threat, taking account of the priority ranking of the sensitivity analysis carried out under the NCP.
❒	Coordinate any external information received from outside scientific and environmental interests.
❒	Assist in the designation of suitable disposal sites, taking account of environmental considerations.
❒	Coordinate the cleaning of any birds and wildlife that are injured by the spill.
❒	Identify environmental sensitivities and prioritise clean up areas throughout the course of the incident.
❒	Participate in the daily debriefing sessions.
CLOSE-OUT ACTIONS	
❒	Compile a report on the environmental implications of the spill for inclusion in the spill report to be compiled by the OSC.
❒	Coordinate any post-spill environmental monitoring studies that are required.

11.8. Media Liaison Officer

In the case of a large oil spill where public interest will be aroused, it will be necessary to appoint a Media Liaison Officer (MELO) to act as the focal point for all communications with the media. He will be responsible for coordinating all media statements and the issue of press releases. The duties of the MELO are:

MEDIA LIAISON OFFICER	
INITIAL ACTIONS	
❒	Obtain all available information regarding the spillage / pollution incident to assess the incident and define its potential impact and the probable spill area
❒	Commence a chronological log of events
❒	To obtain SITREPs from the OSC and prepare a draft press release
❒	Establish contact with the MELO at MoEW in order to ensure a consistency of approach as required.
ON-GOING ACTIONS	
❒	Ensure chronological log of events is kept
❒	Ensure details of all conversations are kept and document all stages of incident
❒	Arrange a press room for media representatives to work equipped with tables, telephones, fax machines and support information.
❒	Ensure with the site security staff that the arrival of media representatives is reported to the MELO and that they are escorted to the press room.
❒	Prepare material for press conference listing: a) all desirable points for publication b) points of doubtful value (note positive aspects) c) undesirable points (questions to be avoided)
❒	Arrange participants for press conference.
❒	Keep OSC informed of scope of press briefings and report back on questions raised.
❒	Arrange personal contact with and the release of information to private organisations (e.g. hotels threatened by the incident) and public bodies concerned (e.g. the Governorate).
❒	Arrange for recorded copies of radio and television bulletins or comments on the incident.
❒	Keep a press record book of all published reports on the incident in newspapers' or journals.
❒	Ensure that public warning notices are erected where necessary
CLOSE-OUT ACTIONS	
❒	
❒	

12. TIER ASSESSMENT

The severity of the spill depends on its size, the complexity of the response and the potential consequences for people, environment, assets, reputation, and for the economy. By identifying the tier level, the appropriate resources can be mobilized to combat the spill.

The DR / OSC should use the table below to help assign an appropriate Tier Level to the incident.

TICK ALL BOXES THAT APPLY: ☑ IF YOU ARE UNSURE, ASSUME WORST CASE	
TIER 1 – LESS THAN 25 m^3	
Small oil spills, or those which can be quickly and easily cleaned up using on-site resources or local contractors	
☐ Oil is contained within the incident site ☐ Spill occurs within immediate site proximity ☐ Day time release ☐ Able to respond to the spill immediately	☐ Source of spill has been contained ☐ Oil is evaporating quickly and no danger of explosive vapours (e.g. diesel) ☐ Spill likely to naturally dissipate ☐ No media interest
TIER 2 – 25 m^3 TO 500 m^3	
Oil spills which pose a threat of significant pollution resulting in the activation of the local authorities' emergency response plans, and the mobilisation of external oil spill response resources	
☐ Danger of fire or explosion ☐ Possible continuous release ☐ Concentrated oil accumulating in close proximity to the site / vessel, etc ☐ Spill occurs within the vicinity of the operational site	☐ Not able to respond to the spill immediately ☐ Potential to impact other installations ☐ Tier 1 resources overwhelmed, requiring additional regional resources ☐ Potential impact to sensitive areas and/or local communities ☐ Local / national media attention
TIER 3 – MORE THAN 500 m^3	
Catastrophic spills, which require the mobilisation of international support	
☐ UNCONTROLLED WELL BLOW OUT ☐ Actual or potentially serious threat to life, property, industry ☐ Major spill beyond site vicinity ☐ Significant shoreline impact	☐ Tier 2 resources overwhelmed, requiring international Tier 3 resources to be mobilised ☐ Oil migrating towards neighbouring countries ☐ Significant impact on local communities ☐ International media attention

Please note when using the Tier Assessment guide;- if one box has been ticked in a higher tier (e.g. for a Tier ! incident most ticks are in the Tier 1 assessment box but maybe you are unable to respond immediately so have also ticked the box in Tier 2) then the higher level should take precedence.

13. OIL SPILL RESPONSE OPTIONS

All oil spills must be monitored until they have completely dispersed. The four key oil spill response options available are:

- Monitor the state of the oil using the safety standby vessel and aerial monitoring as a standby if oil persists on the surface of the sea;
- To allow the oil to disperse naturally;
- To apply chemical dispersant.
- Mechanical Recovery

The appropriate response will depend not only on the potential limitations of each of the possible response options but also on the type of oil spilt and the environmental sensitivities that are threatened by the spill (table 13.1). Mechanical recovery is possible offshore, but only under excellent weather conditions and with heavy oils.

TABLE 13.1 POTENTIAL RESPONSE OPTIONS ACCORDING TO OIL TYPE AND ENVIRONMENTAL SENSITIVITIES

Option	Oil type		Limitations
	Non-persistent (Diesel/ Condensate/ aviation fuel)	Persistent (Lube / hydraulic oil)	
Monitoring	✓	✓	The oil must be monitored (from the standby vessel or by aerial monitoring if necessary) and the strategy reviewed if surface sensitive features, seabirds or installations are threatened.
Natural Dispersion	✓	×	This is the only option in rough weather and is the preferred option for small offshore oil spills, particularly diesel and condensate spills offshore. It leaves the oil on the surface to be moved by the wind.
Chemical Dispersion	×	✓	Only required when oil presents a risk to the safety of the rig or vessels, could potentially impact "rafts" of flightless seabirds (particularly auks) or when oil may reach the shoreline. Requires the agreement of MoEW prior to use. Only approved products may be used. Needs good weather, nominally less than Force 4-5 (Beaufort scale). Preferable that is it used quickly (<1 hour) following a spill, while the oil is still amenable to dispersion. *Efficacy in the field must be tested by mixing dispersant, oil and seawater, in the ratio of 1 part (dispersant): 20 parts (oil): 400 parts (seawater), shaking then observing whether the oil disperses and remains dispersed in the water column.
Mechanical	×	✓	Needs good weather, nominally less than Force 4-5 (Beaufort

Recovery			scale). Often only a low recovery of oil is achieved. Logistics and final disposal need to be considered carefully. Not usually considered a practical option offshore in the North Sea, particularly not applicable to diesel/condensate spills.

Surveillance and Monitoring

For light oils, response to small spills is to allow biological and physical processes to disperse oil naturally. Propeller action by infield standby vessels and vessels of opportunity will accelerate the rate of dispersion. The physical appearance of the slick should be monitored closely and if there are changes in the oil or conditions, which may influence the perceived impact, an alternative response should be considered, and response resources prepared for mobilisation.

Chemical Dispersant Spraying

Option to apply dispersant by sea and/or air to aid and accelerate natural processes dispersing the oil, thus removing it from the sea surface.

Mechanical Containment and Recovery

For large spills in environmentally sensitive areas or oils that are not amenable to dispersion an at sea and/or shoreline response would be initiated to mobilise containment booms and Oleophilic/weir recovery skimmers.

With a spill of diesel or condensate, mechanical recovery is not recommended.

More detailed response guidance notes are provided in Appendix C.

14. COMMUNICATIONS PLAN

14.1. Routine Exchange of Information

For routine communications, the **public switched networks** should normally be used. The use of **telefax** should be given preference as this provides a permanent record of the communication. However, **telephone** and **mobile phones** (when in range) provide a more rapid and effective two-way means of communication.

The use of **e-mail** can be helpful to transmit digital information, e.g. images of an incident recorded with a digital camera. It should be remembered that an e-mail mail box may not be accessed for some time and therefore e-mail should not be used for transmitting urgent information without warning the recipient by some other means of communication.

14.2. Operational Communications During Response Operations

Efficient communications and smooth message traffic during response operations should facilitate effective performance of functions related to the operational command of the incident. The following definitions may help to clarify what is meant by this.

Incident command means the overall coordination of all involved personnel and equipment means and will be exercised by the Incident Commander.

Operational control means direct control over personnel, means and units performing response operations at the scene of the oil pollution incident and will be exercised by the On Scene Commander (OSC).

Tactical command means directing and supervising the execution of specific tasks by work teams and units and will be exercised by Marine Team Leaders and Shoreline Team Leaders.

14.3. Incident Command

The overall command of a Tier Two or Tier Three incident will normally be exercised by the Incident Commander at MoEW (see Section 11), however, in the case of a Tier One and possibly Tier Two oil pollution incidents, the On Scene Commander is also likely to be the Incident Commander and the following procedures should be adapted accordingly.

For transmission of his orders, the MoEW Incident Commander will use:

1. **Public switched networks (telephone and fax)** for all shore-to-shore communications including communication with the OSC and other parties. All phone conversations should be recorded in the personal log sheet for subsequent record keeping, especially in the event of claims for compensation and clean-up costs.
2. **Mobile phones** only when it is not possible to use the public switched network and provided there is coverage. Again, ensure that all phone conversations should be recorded in the personal log sheet for subsequent record keeping, especially in the event of claims for compensation and clean-up costs.
3. **Satellite Communications** only when it is not possible to use the public switched network or mobile phones.

4. **VHF radio** for use on shorelines (during cleanup) and, for shore-to-sea communications – be aware that this means of communication is unsecure and that anyone can listen in to standard marine frequencies
5. **E-mail** for the transmission of digital information, e.g. images of an incident, reports, etc. It should be remembered that an e-mail mail box may not be accessed for some time and therefore e-mail should not be used for transmitting urgent information

14.3.1 Operational Control

Instructions for conducting response operations and for transmitting other relevant information will be communicated to marine response units and shoreline teams by the On Scene Commander.

For transmission of his orders, the OSC should use:

1. **Public switched networks (telephone and fax)** for all shore-to-shore communications including communication with MoEW and other parties.
2. **VHF radio stations** (mobile or installed on board vessels and aircraft) for sea-shore and sea-to-sea communications between vessels.
3. **Mobile phones**, where their coverage is sufficient, for shore-shore and shore-sea communications.
4. **Coastal radio stations** on MF frequencies when communicating to vessels outside the VHF range.

14.3.2 Tactical Command

Communications at the scene of response operations between vessels, aircraft and response personnel on the ground should be maintained using:

1. **VHF radio** (portable/mobile or installed on board vessels and aircraft) for shore-shore, shore-sea, sea-sea, sea-air and air-air traffic.
2. **Mobile phones**, where their coverage is sufficient, for shore-shore and shore-sea traffic.

14.3.3 Specific Advice For Aircraft

For communications between sea or shore, on the one hand, and aircraft used for either surveillance or dispersant spraying, on the other, **marine band VHF** communication should be used. For this purpose, observers on board aircraft should be provided with portable VHF stations. These stations should be able to operate on all selected channels.

Maximum height for the use of marine band VHF equipment on board aircraft should not exceed 1,000 feet (300 metres). As a rule, mobile phones should not be used on board aircraft.

Part C: Data Directory

15. CONTACTS DIRECTORY

Organisation	Contact	Telephone	Faxsimile	24 Hr. Telephone	24 Hr. Faxsimile	Mobile/ Pager E-Mail / Telex

16. CONTROLLED COPY HOLDERS

Copy Number	Company	Position
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

17. MAPS

APPENDICES

APPENDIX A: FORMS

This section includes the proforma report forms which may be issued in the event of a spill and used to record events – see following pages.

A.1 Oil Pollution Report Format (OILPOL)

Identity code	Information to be provided	
A	CLASSIFICATION of Report: - Doubtful - Probable - Confirmed	
B	DATE & TIME IDENTITY	
C	POSITION & EXTENT OF POLLUTION	
D	TIDE & WIND	
E	WEATHER CONDITIONS & SEA STATE	
F	CHARACTERISTICS OF POLLUTION	
G	SOURCE & CAUSE OF POLLUTION	
H	VESSELS IN THE AREA	
J	PHOTOGRAPHS & SAMPLES	

K	REMEDIAL ACTION	
L	POLLUTION FORECAST	
M	OTHERS INFORMED	
N	OTHER INFORMATION	

EXPLANATORY NOTE

This format is to be used by the reporting agency to inform MOEW about an oil pollution incident, or the threat of an oil pollution incident. Every effort should be made to provide all the information requested. However, the notification of an incident to MOEW should not be delayed simply because not all information is immediately available.

Identity code	Information to be provided	Explanation
A	CLASSIFICATION of Report: -Doubtful -Probable -Confirmed	*Delete as appropriate*
B	DATE & TIME IDENTITY	*Date and time pollution observed.* *Identity of observer/reporter.*
C	POSITION & EXTENT OF POLLUTION	*If possible, state range and bearing of some prominent landmark or Decca position and estimated amount of pollution, e.g. size of polluted area; number of tonnes of oil spilled. When appropriate, give position of observer relative to pollution.*
D	TIDE & WIND	*Indicate speed and direction*
E	WEATHER CONDITIONS & SEA STATE	*Indicate as appropriate.*
F	CHARACTERISTICS OF POLLUTION	*Give type of pollution, e.g. crude oil or otherwise.* *Give visual appearance, e.g. liquid oil; semi-liquid sludge; tarry lumps; weathered oil; discolouration of sea.*
G	SOURCE & CAUSE OF POLLUTION	*e.g. from vessel, offshore platform or other oil handling facility.* *If from a vessel, say whether as a result of apparent deliberate discharge or a casualty. If the latter, give a brief description.* *Where possible, give name, type, size, nationality and Port of Registry of polluting vessel.* *If vessel is proceeding on its way, give course, speed and destination (if known).*
H	VESSELS IN THE AREA	*Details of vessels in the area to be given if the polluter cannot be identified and the spill is considered to be of recent origin.*
J	PHOTOGRAPHS & SAMPLES	*State whether photographs have been taken and/or samples for analysis.*
K	REMEDIAL ACTION	*State any remedial action taken, or intended, to deal with*

		the spillage.
L	POLLUTION FORECAST	*Forecast of likely effect of pollution, e.g. arrival on beach with estimated timing.*
M	OTHERS INFORMED	*Name other individuals or agencies informed other than EEAA.*
N	OTHER INFORMATION	*Give any other relevant information, e.g. names of other witnesses.*

A.2 Oil Spill Log

Name:	
Team:	
Role:	
Location:	
Date / Time	**Communication / Action Taken / Notes**

A.3 MOEW Notification Following Use of Dispersant

MOEW FAX. NUMBER XXXX (To be confirmed) **SENT BY:**
Incident no.
Volume and type of oil
Location
Remedial action taken
Name and type of oil treatment product
Date of manufacture
Efficacy last tested (if applicable)
Comments on effectiveness
Report made to MOEW by:
Other remarks

A.4 Aerial Surveillance Observers Log

Survey Details									
Incident		Date		Observers					
Aircraft Type		Call Sign		Area of Survey					
Survey Start Time		Survey End Time		Average Altitude		Remote Sensing Used			
Weather Conditions									
Wind Speed (knots)				Wind Direction					
Cloud Base (feet)				Visibility (nm)					
Time High Water				Time Low Water					
Current Speed (knots)				Current Direction					
Slick Details									
Slick Grid Parameters by Lat/Long				Slick Grid Parameters by Air Speed		Slick Grid Dimensions			
Length Axis		Width Axis		Length Axis	Width Axis	Length	Nm		
Start Latitude		Start Latitude		Time (seconds)	Time (seconds)	Width	Nm		
Start Longitude		Start Longitude				Length	Km		
End Latitude		End Latitude		Air Speed (knots)	Air Speed (knots)	Width	Km		
End Longitude		End Longitude				Length	Km		
						Total Grid Area	Km^2		
Oil code	**Colour**	**% cover observed**	**Total grid area**	**Area per oil code**	**Factor**	**Oil volume**			
						Min		Max	m^3
0	Clean		Km^2	Km^2	0 m^3 /km^2		-		m^3
1	Silver		Km^2	Km^2	0.04 - 0.3 m^3 /km^2		-		m^3
2	Rainbow		Km^2	Km^2	0.3 – 5 m^3 /km^2		-		m^3
3	Metallic		Km^2	Km^2	5 - 50 m^3 /km^2		-		m^3
4	Discontinuous True Colour		Km^2	Km^2	50 - 200 m^3 /km^2		-		m^3
5	Continuous True Colour		Km^2	Km^2	200 - <200 m^3 /km^2		-		m^3

APPENDIX B: GENERIC RISK ASSESSMENT

B.1 Risk Analysis

This section identifies the type and size of oil spill that the Republic of Lebanon oil spill response arrangements may have to cope with. It looks at the generic likelihood of spills that could occur from typical operations, gives an overview of the potential 'operational' and 'worst case' scenarios, the fate of the oils involved and the risk of this to the environment. The MoEW response arrangements are based on this information.

The severity of effects from an oil spill is dependent on a very wide range of factors including:

Volume of oil spilled;

Physical and chemical nature of the oil;

Location of spill and proximity of shoreline or other sensitivities;

Weather and sea state conditions during and following the spill;

Hydro graphic conditions;

Time of year;

Time of day.

Given this variety of factors accurate predictions of effects before a spill are difficult to make. However in spill contingency planning, consideration of environmental resources potentially affected by a spill in conjunction with the results of trajectory and stochastic modelling allows the identification of likely response options and resource needs. Rapid access to information on the environmental conditions and features is essential in actual or simulated oil spill response.

B.2 Fate of Split Oil

The International Tanker Owner Pollution Federation (ITOPF) have ranked oils according to their physical characteristics (API/SG) and likely spill behaviour.

ITOPF Categories

Group 1	SG <0.8	API >45	**Light**
Group 2	SG 0.8-0.85	API 35-45	
Group 3	SG 0.85-0.95	API 17.5-35	
Group 4	SG >0.95	API <17.5	**Heavy**

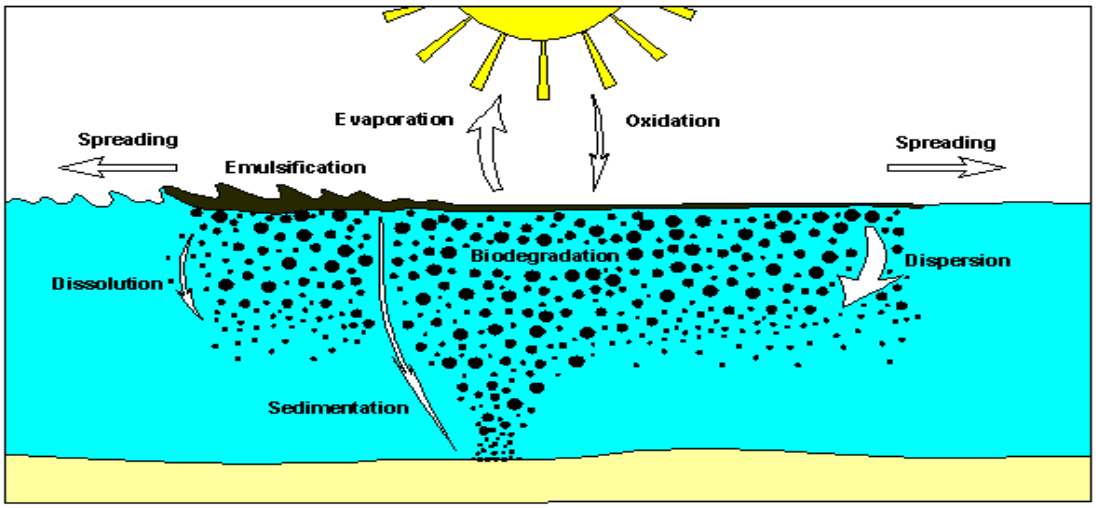
A typical light crude would be a Group 1 oil, under this classification. Diesel is a Group 1 oil. The expected removal rates of these oils from the sea surface are shown in Figure B.4. Group 1 oils are rapidly removed and Group 2 oils first undergo emulsification before being relatively quickly removed from the sea surface.

Note: Oils only behave as per their given group at ambient temperatures above their pour points. At temperatures lower than pour point they should be considered as Group 4.

Oil, spilled offshore, will normally break up and be dissipated into the marine environment over time. This dissipation is a result of several chemical and physical processes that progressively alter the make-up of the oil from when it was spilled. The processes are collectively known as weathering. Oils are termed persistent or non-persistent depending on how quickly an oil slick breaks up and dissipates. Light products such as diesel and kerosene under most conditions, evaporate and dissipate quickly and naturally, and rarely need cleaning-up. In contrast, persistent oils, such as many crude oils, break up and dissipate more slowly and may require a clean-up response. Physical properties such as the density, viscosity, wax content and pour point of the oil all affect its behavior.

As soon as oil is spilled, it starts to spread out over the sea surface, initially as a single slick. The speed at which this takes place depends largely on the viscosity of the oil. Fluid, low viscosity oils spread more quickly than those with a high viscosity. Normally, slicks quickly spread over the sea surface. Typically, spreading is not uniform with large variations in the thickness of the oil. After a few hours the slick will begin to break up and, because of wind and wave action, will form narrow bands or windrows in parallel to the wind direction. The rate at which the oil spreads is also determined by the prevailing conditions such as temperature, water currents, tidal streams and wind speeds.

Figure B.4. Fate of Spilled Oil After Spillage (ITOPF)



There are eight main oil weathering processes:

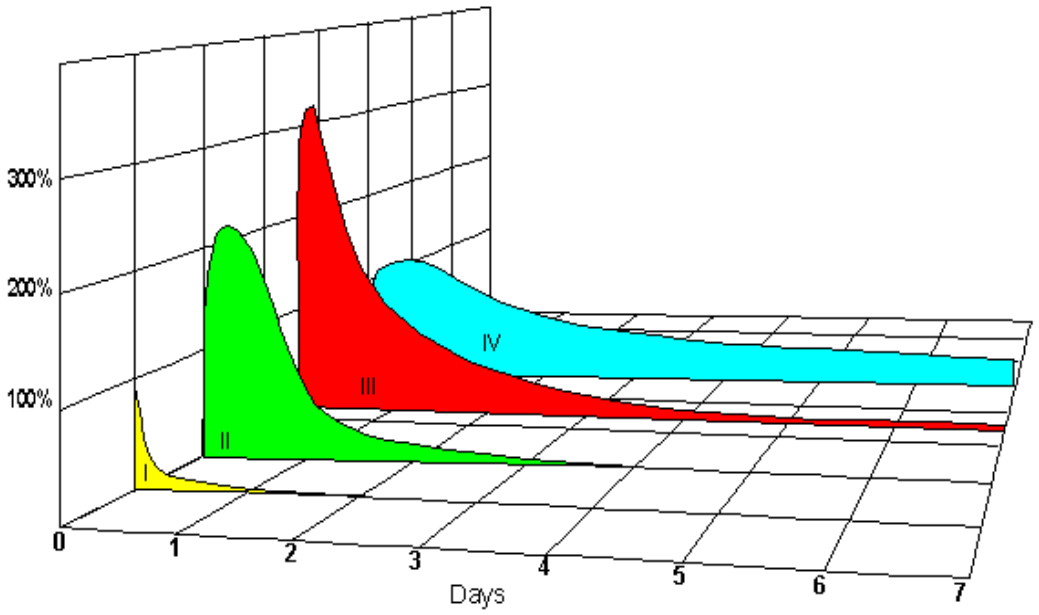
- **Evaporation** – Lighter components of an oil, evaporate to the atmosphere. The amount of evaporation and the speed at which it occurs depend upon the volatility of the oil and the ambient temperature. Oil with a large percentage of light and volatile compounds will evaporate more than one predominantly composed of heavier compounds. For example, kerosene and diesel oils tend to evaporate almost completely within hours to days while little evaporation occurs from a heavy fuel oil.

In general, in temperate conditions, those components of the oil with a boiling point under 200ºC tend to evaporate within the first 24 hours. Evaporation can increase as the oil spreads, due to the increased surface area of the slick. Rough seas, high wind speeds and high temperatures tend to increase the rate of evaporation and thus the proportion of an oil lost by this process.

- **Dispersion** – Waves and turbulence at the sea surface can cause a slick to break up into fragments and droplets of varying sizes which become mixed into the upper levels of the water column. Some of the smaller droplets will remain suspended in the sea water while the larger ones will tend to rise back to the surface, where they may either coalesce with other droplets to reform a slick or spread out to form a thin film. Small droplets have a greater surface area which facilitates other natural processes such as dissolution, biodegradation and sedimentation. The speed at which an oil disperses is largely dependent upon the nature of the oil and the sea state, and occurs most quickly if the oil is light and of low viscosity and if the sea is very rough. A combination of these factors led to the complete dispersion of the oil (a light Norwegian crude) spilled from the BRAER at the Shetland Islands in 1993. The use of chemical dispersants can accelerate the process of dispersion.
- **Emulsification** – An emulsion is formed when two liquids combine, with droplets of one becoming suspended in the other. In emulsification of crude oils sea water droplets become suspended in the crude. This occurs as a result of physical mixing promoted by wave action. The emulsion thus formed is usually very viscous and more persistent than the original oil and is often referred to as chocolate mousse because of its appearance. The formation of these emulsions causes the volume of the slick to increase between three and four times and slows and delays the other processes which cause the oil to dissipate. Emulsions are not normally amenable to chemical dispersants. Oils with an asphaltene content greater than 0.5% tend to form stable emulsions which may persist for many months after the initial spill has occurred. Oils with a lower asphaltene content are less likely to form emulsions and more likely to disperse. Emulsions may separate back into oil and water again if heated by sunlight under calm conditions or when stranded on shorelines.
- **Dissolution** – Some compounds in oil are water soluble and will dissolve into the surrounding water. The proportion dissolving depends on the composition and state of the oil, and occurs most quickly when the oil is finely dispersed in the water column. Components that are most soluble in sea water are the light aromatic hydrocarbons compounds such as benzene and naphthalene. However, these compounds are also those first to be lost through evaporation, a process which is 10-100 times faster than dissolution. In contrast to diesel, crude oil contains only small amounts of these compounds making dissolution one of the less important processes.
- **Oxidation** – Oils react chemically with oxygen either breaking down into soluble products or forming persistent tars. This process is promoted by sunlight. This process is very slow and even in strong sunlight, thin films of oil break down at no more than 0.1% per day. The formation of tars can form an outer protective coating of heavy compounds that results in the increased persistence of the oil as a whole. Tar balls, such as found on shorelines, have a solid outer crust surrounding a softer, less weathered interior and are a typical example of this process.

- **Sedimentation/Sinking** – Sea water has a density of approximately 1.025 and very few crudes are dense enough or weather sufficiently, so that their residues will sink in the sea. Sinking is usually caused by the adhesion of sediment particles or organic matter to the oil. In contrast to offshore, shallow waters are often laden with suspended solids providing favourable conditions for sedimentation. Oil stranded on sandy shorelines often becomes mixed with sand. If this mixture is then washed off the beach into the sea it is likely to sink. In addition, if the oil is burned after it has been spilled; the tarry residues may be sufficiently dense to sink.
- **Biodegradation** – Sea water contains a range of micro-organisms that can partially or completely breakdown the oil to water soluble compounds (and eventually to carbon dioxide and water). Many types of hydrocarbon bacteria exist and each tends to degrade a particular group of compounds in crude oil. However, some compounds in oil are very resistant to attack and may not degrade. The main factors affecting the efficiency of biodegradation are the levels of nutrients in the water, temperature and the level of oxygen present. The creation of oil droplets, either by natural or chemical dispersion, increases the surface area of the oil, and thus increases the area available for biodegradation to take place.
- **Combined processes** – The processes of spreading, evaporation, dispersion, emulsification and dissolution are most important early on in a spill whilst oxidation, sedimentation and biodegradation are more important later. To predict how different oils change over time whilst at sea, some simple models have been developed based on oil type. Oils have been classified into groups roughly according to their density as generally, oils with a lower density will be less persistent. However some apparently light oils can behave more like heavy ones due to the presence of waxes. One model uses the half-life (the time needed for 50% of the oil to disappear from the sea surface) for a group of oils to describe the persistence and the time needed for the oil to dissipate – see Figure B.5. After six half-lives have passed, about 1% of the oil will remain. Weather and climatic conditions will alter the rates shown e.g. in rough weather a group 3 oil may dissipate in a timescale similar to a group 2 oil.

Figure B.5. The rate of removal of oil from the sea surface according to type (the volume of oil and oil-in-water emulsion remaining on the sea surface is shown as a percentage of the volume spilled)



B.3 Effect of Spilt Oil and Environmental Risk

Effect of Spilt Oil

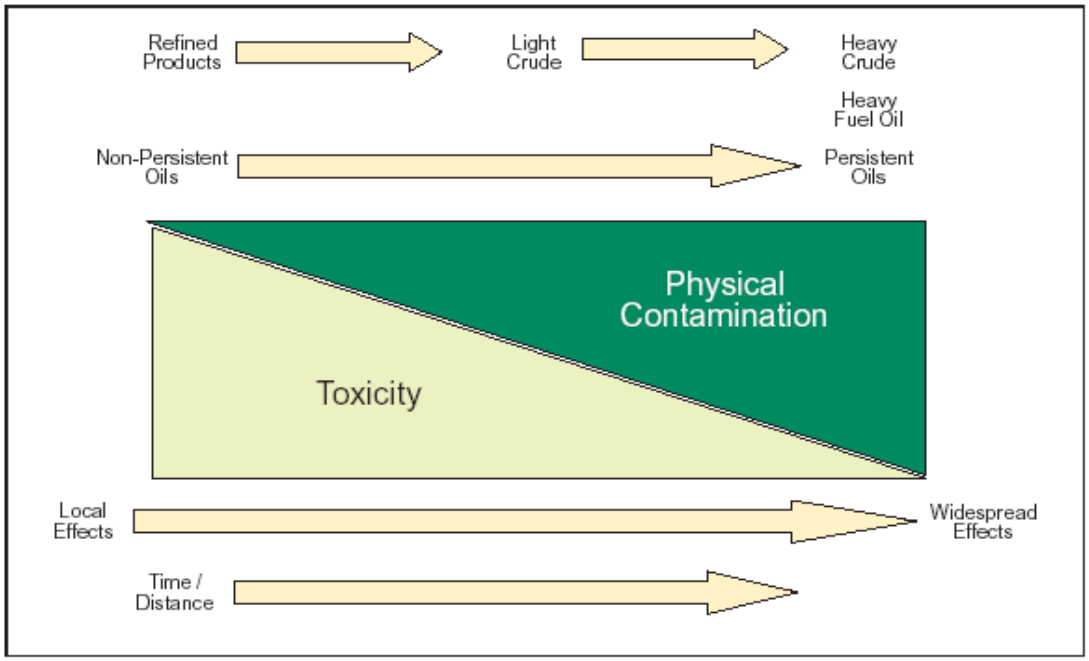
The risk to the environment is the result of the probability of a spill occurring multiplied by its consequences. The larger the spill, the greater it's potential to cause damage. The closer the environmental sensitivity to the oil, the greater its potential to be damaged.

The effects of oil in the environment are related to the following:

- toxicity; primarily the lighter more volatile fractions can kill or debilitate organisms.
- physical effects; smothering of plants and animals, preventing photosynthesis and respiration and causing loss of insulation to animals with fur or feathers.
- tainting; whereby the flavour of fish meat can be tainted with an 'oily' taste for a period following an oil spill.

The type of oil and its effects on the environment over time are shown in Figure B.6 below. From the point that oil is spilt at sea, its composition and location will change with time. The volume of the slick will tend to decrease rapidly due to weathering by the weathering agents. For a diesel or condensate spill the principal factor removing oil from the sea is evaporation. Light oils will spread rapidly on the sea surface and until dispersion has taken place, will move with the surface water currents and the prevailing wind.

Figure B.6. Illustration of the Effects of Oil (from Dicks 1992)



Environmental Risk

Guidelines have been created for the establishment of risk acceptance criteria for environmental risks posed by acute oil spills, based upon probability levels and consequence levels (*OLF, 1994*). According to these guidelines, frequency of occurrence data may be used in place of probability data. Table B.4 presents risk acceptance criteria as a matrix. Tables B.5 and B.6 define probability levels and consequence levels, respectively.

Table B.4 Environmental risk acceptance criteria presented in a matrix in relation to Probability levels and Consequence Levels (OLF, 1994)

PROBABILITY LEVELS						
	5	B	C	D	D	D
	4	B	B	C	D	D
	3	A	B	B	C	D
	2	A	A	B	B	C
	1	A	A	B	B	B
		1	**2**	**3**	**4**	**5**
				CONSEQUENCE LEVELS		

A= Acceptable Risk, B= Acceptable risk, but measures ought to be implemented, C= Unacceptable risk unless risk reducing measures are in place, D= Unacceptable risk

TABLE B.5 PROBABILITY LEVELS / FREQUENCY OF OCCURRENCE (OLF, 1994)	
Probability level	**Frequency of Occurrence**
Level 1	0 – 0.0001 (Less than one incident per 10,000 years)
Level 2	0.0001 – 0.01 (Incidents occur at a rate of one per 10,000 years to one per 100 years)
Level 3	0.01 – 0.1 (Incidents occur at a rate of one per 100 years to one per 10 years)
Level 4	0.1 – 1 (Incidents occur at a rate of one per 10 years to one per year)
Level 5	>1 (Incidents occur more often than once per year)

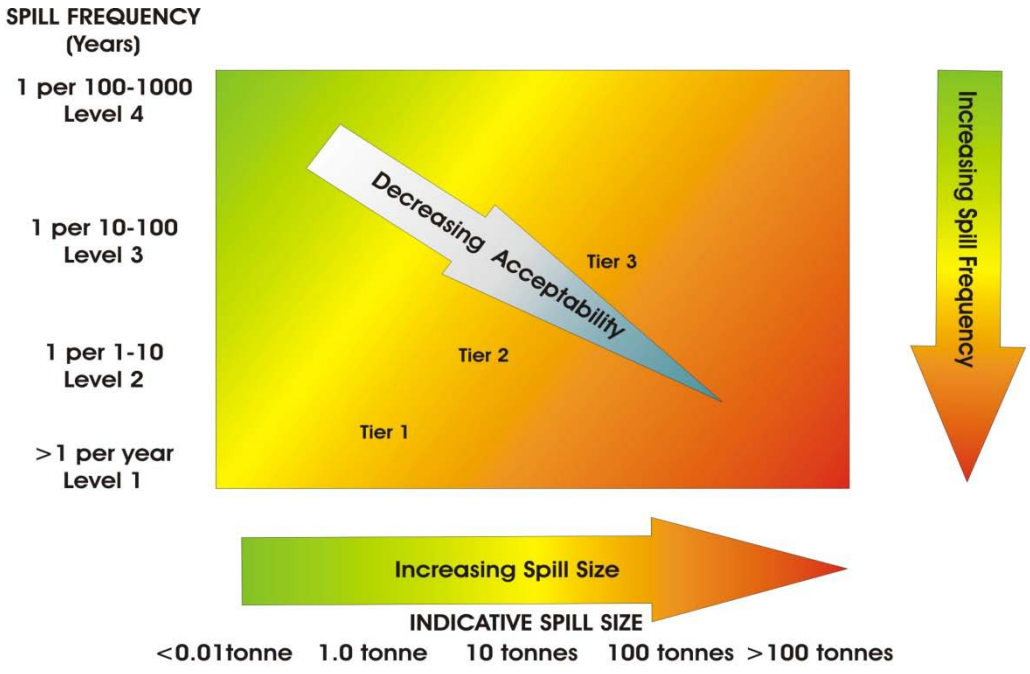
TABLE B.6 ENVIRONMENTAL CONSEQUENCE LEVELS (OLF, 1994)		
Consequence level	**Category of environmental damage**	**Description of environmental damage**
Level 1	Indemonstrable environmental damage	No demonstrable or measurable effect.
Level 2	Minor environmental damage	Few fish, birds and sea mammals affected; <1 kilometre of coastline affected.
Level 3	Moderate environmental damage	Some effect on fish, birds & sea mammals; restoration time <2 years; 1 to <10 kilometres of coastline affected.
Level 4	Significant environmental damage	Affects animal life which will threaten the multiplicity of fish, birds or sea mammals in the influence area; restoration time 2 - 5 years; 10 to <100 kilometres of coastline affected; affects areas of scientific interest.
Level 5	Serious environmental damage	Affects animal life which will threaten the multiplicity of fish, birds or sea mammals in the influence area; restoration time >5 years; >100 kilometres of coastline affected; significant effect on preservation areas.

Assessment of Environmental Risk and Risk Mitigation

Location and time to beaching can be estimated using slick trajectory analyses based on spill location and volume spilled. Utilising the OLF criteria, risk matrix methodology can be applied to give an assessment of overall environmental risk from a spill. The matrices are formed from a combination of probability of occurrence (plotted vertically down the matrix) and size of spill, equating to environmental consequence (plotted horizontally across the matrix) (Figure B.7).

The overall frequency of spills is low, however small diesel spills have a relatively high frequency of occurrence compared to other oil spill scenarios and therefore plot into the high probability level in the matrix. However, as consequence level 1 type spills, they will disperse rapidly and would normally result in minimal environmental damage. They therefore plot into the lowest matrices for environmental consequence. A diesel spill of greater than 50 tonnes has a lower frequency of occurrence but still plots into the high level of occurrence. These situations will both be classified as 'acceptable risk' (see Figure B.7) providing that precautions are taken to minimise the risk of these spills. Environmental effects are related to the presence of sensitive features at the time of the spill and are therefore likely to be limited to minor effects on small numbers of marine fauna such as seabirds and fish present in the immediate vicinity of the spill.

Figure B.7. Spill Size and Frequency versus Potential Effects



Diesel/LTOBM Spill	ENVIRONMENTAL CONSEQUENCE				
Level 1	Level 1-2	Level 2-3	Level 3	Level 3-4	
Light Crude Spill	Level 1	Level 2	Level 2-3	Level 3	Level 3-4

APPENDIX C: GUIDE TO OIL SPILL RESPONSE

C.1 Introduction

This guide provides supporting information to personnel involved in planning and executing oil spill response with Lebanese territorial waters. The document should be read and understood by all response organisation personnel as detailed in the NCP.

This guide gives information on each type of response available in the event of a spill at sea and provides details on factors affecting selection and deployment of response.

C.2 Response Options

The response strategy adopted will depend upon the spill details and the prevailing environmental conditions. The essential information required as a basis for decision making is:

Size and status of the oil spill (e.g. controlled or uncontrolled);

- Location of the oil slick;
- Type of oil and its characteristics;
- Meteorological information, current and predicted weather and sea state;
- Authorities informed;
- Action taken;
- Evidence gathered e.g. samples and photographs.

More information will be required, as the situation develops, for example as a part of the monitoring process, a survey of the location of seabirds might be carried out to determine the advisability of using dispersants. Aerial surveillance and monitoring will also form an integral part of the response, for example in the case of a large oil spill where the use of dispersant is being used.

Options Available

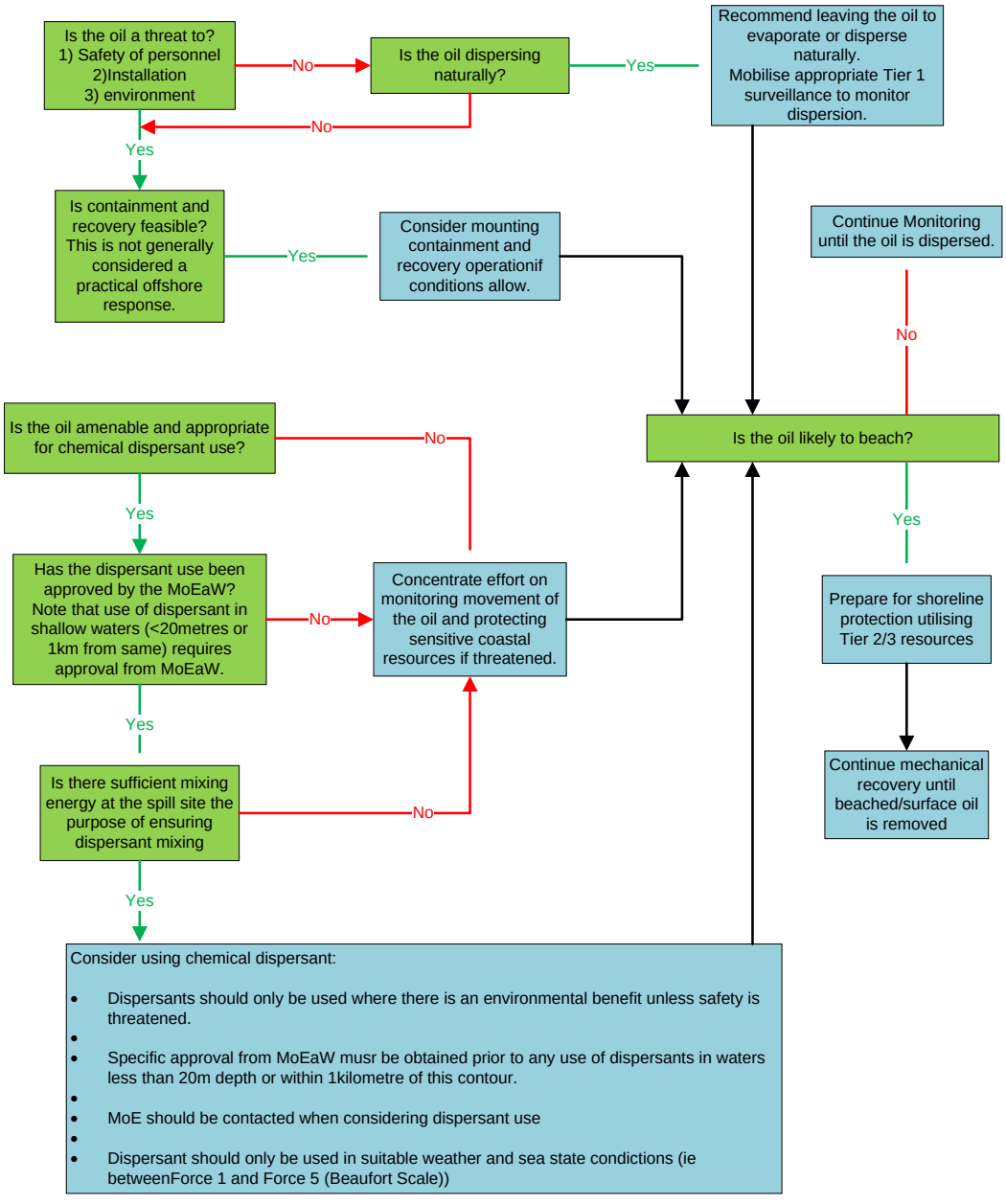
The main elements of response are outlined below:

- Monitoring.
- Natural dispersion – maintain the spill under observation but with no active intervention.
- Chemical dispersion of the oil spill.
- Mechanical containment and recovery of the spilt oil.
- On shore clean-up.

C.3 Response Option Section Decision Guide

All spills to be monitored and reported.

The slick must be monitored until completely dispersed. Small slicks may be monitored from a vessel. Large slicks will require aerial surveillance to monitor the spilt oil.



C.4 Oil Specific Response Guidance Notes

The following table is designed to provide response personnel with information and guidance when deciding upon the most effective response strategy for a spill within Lebanese marine waters.

Prior to selecting a response strategy details should be obtained regarding the characteristics of the hydrocarbon, its International Tanker Owners Pollution Federation (ITOPF) group and its anticipated behaviour upon release into the marine environment.

Early consultation with regulators and wildlife groups is essential prior to embarking upon a strategy.

Table C4.1: Oil Specific Response Guidance Notes

Strategy	Oil Type 1	Oil Type 2	Oil Type 3
Surveillance & Monitoring ***This strategy may only be employed for small spills of non-persistent hydrocarbon out with environmentally/ commercially sensitive areas.***	This oil will naturally disperse however some heavier ends may persist for a few hours following the spill. The speed of natural dispersion will be dependent on the wind speed and temperature. Natural dispersion will be more rapid under higher wind speeds and temperatures.	Natural dispersion will be controlled by the wind speed (and therefore sea state) and the viscosity of the oil residue or water-in-oil emulsion. In very calm seas there will be little natural dispersion into the water column. The rate of natural dispersion will increase with sea state, but will slow considerably with emulsification.	Natural dispersion will be controlled by the wind speed (and therefore sea state) and the viscosity of the oil residue or water-in-oil emulsion. In very calm seas there will be little natural dispersion into the water column. The rate of natural dispersion will increase with sea state, but will become slower with emulsification.
Chemical Dispersant Spraying *The approved or agreed use of dispersant for use (with MOEW approval prior to dispersant use) is one of the most effective means of dealing with a spill of crude oil in deep water which is likely to reach the shoreline if not dispersed. Type of oil and speed of response and supply chain logistics are issues to achieve the best effectiveness. The*	Type 1 oils should not be treated with dispersant.	<u>Summer Temperatures:</u> Weathered oil (i.e. oil which has lost light ends but not yet emulsified) will be amenable to dispersants. The water-in-oil emulsion is also likely to be amenable to dispersant use. The window of opportunity for dispersant spraying will range from several hours to several days depending on the wind and sea	<u>Summer Temperatures:</u> Spills may be amenable to dispersants if sprayed sufficiently quickly and before emulsions become very viscous. However, in higher sea states this is likely to occur within about 1 hour at sea (20-30 knot winds). The time window for spraying is therefore likely to be short. This may rule out a vessel-mounted dispersant

level of response will be dependent upon the size of spill, oil type and prevailing weather conditions.		state. Winter Temperatures: Application will depend on the rapidity of evaporation and emulsification. Under lower wind speeds the evaporation and emulsification processes may be slow therefore oils may be amenable to dispersants if sprayed swiftly. Chemical dispersant applied in these conditions will be effective but possibly at reduced efficiency. The use of a demulsifier treatment with subsequent dispersant treatments is likely to be effective and may extend the time window of effective dispersant use by up to 1 or 2 days.	spraying option. Winter Temperatures: Oils may not be amenable to dispersants.
Mechanical Containment & Recovery ***An offshore containment and recovery response is generally regarded as a less effective means of responding to an oil spill in open water environments compared to a dispersant based approach. This is because mobilisation time, encounter rate, weather and logistics all serve to reduce the efficiency of the strategy.***	Unlikely to be required.	Optimum recovery will occur when the oil is greater than 1000cp. Viscosity's of >10,000cp may require specialist recovery equipment. If the oil reduces to a semi-solid state in winter this is likely to require specialist equipment for recovery.	Viscosity's of >10,000cp may require specialist recovery equipment.

C.5 Monitoring

All spilt oil must be kept under observation until it has completely dispersed or been recovered. Sustained aerial observation and observation during the hours of darkness should only be carried out using specialised, multi-engine, fixed wing aircraft equipped for this. The observer for the flight must be experienced and be able to correctly identify surface and dispersed oil on the sea from amongst other 'phenomena' that have a similar appearance.

The slick should be monitored at least twice daily until dispersed or been recovered. The observations of the surveillance must be passed daily to the interested government bodies until the response is stood down. Normally these would be the MoEW and MoE, however others may be appropriate if the oil approaches to within 12 miles of the shore.

Aerial surveillance is the method of choice for observation. Height allows visibility over a wide area and, combined with the high speed of aircraft, allows a large area to be covered and the 'big picture' to be seen. Aerial observation allows response units to be co-ordinated and directed to great effect and allows detection of environmental sensitivities in the path of the oil slick in 'real time'.

Prior to the flight the observer and pilot must be briefed upon weather conditions, weather forecast, surface water currents and predicted position of the oil slick. A flight plan must be developed which will consist of a ladder search that will proceed across the expected track of the oil. The observer should be equipped with a suitable chart, already marked into grid sections and during the flight must communicate with the pilot to ensure that the aircraft's position at any time is known so that accurate references can be passed on. The search height will be determined by conditions on the day.

Guidelines for Detection, Investigation and Post flight Analysis/Evaluation for Volume Estimation (Bonn Agreement Oil Appearance Code (BAOAC) 2003

Detection

The main detection equipment is radar and / or visual look out. Most marine pollution aircraft have Side Looking Airborne Radar (SLAR).

After the initial detection where possible the aircrew should try to orientate the flight path so that all the oil passes down one side of the aircraft, parallel to the flight path, at a range of between 5 and 10 miles: this positioning optimises the radar performance and avoids the 'radar blind' area directly beneath the aircraft.

If time permits a 'radar' box should be flown around the slick at a range of between 5 and 10 miles. This ensures that at some stage the oil and sea will present the best aspect for data collection to the radar. The best SLAR image will normally be available when the surface wind is at 90^0 to the aircraft's flight path.

Investigation – Data Collection

Following the detection the slick should be thoroughly investigated using the vertical remote sensing instruments; IR, UV and Vertical Camera. The aircraft should be flown directly over the oil to enable the 'plan' view (the most accurate view) of the slick to be recorded.

The UV sensor may enable an accurate 'overall' area measurement. UV may also show the areas not covered with oil allowing the overall area measurement to be 'adjusted'. The vertical camera may provide area and appearance data of the oil. The IR data may give a 'relative' thickness of the slick, which can be used to supplement the UV, and Vertical Camera information.

It is suggested that the aircraft is flown 'up' the line of oil towards the 'polluter', ship or rig; this avoids the IR 'flaring out' because of the rapid increase in temperature associated with the vessel (engines) or installation (flare).

It is also suggested that the aircraft is flown at a height that allows as much of the slick as possible to fall within the field of view of the vertical sensors. In general terms it is understood that most IR sensors have a field of view of 300m (1000 feet) when the aircraft is at 300m; (1000 feet) so if the line of oil is considered to be 600m (2000 feet) wide to ensure that all the oil is scanned an aircraft height of 900m (3000 feet) is suggested. It may be necessary to 'map' large slicks.

Investigation – Visual Observation

Visual observation of the pollution and polluter provides essential information about the size, appearance and coverage of the slick that are used to calculate the initial estimate of volume. The visual form of an oil slick may also suggest the probable cause of pollution:

- A long thin slick of thin oil sheen suggests a possibly illegal discharge of oil from a ship. The cause is obvious if the ship is still discharging, as the slick will be connected to the ship, but the slick may persist for some time after discharge has stopped; it will subsequently be broken up and dispersed by wind and waves.
- A triangular slick with one side aligned with the wind and another aligned with the prevailing current suggests a sub-sea release, such as that from a sub-sea oil pipeline or oil slowly escaping from a sunken wreck.
- Slicks seen some distance 'down current' of oil installations, particularly in calm weather, may be caused by re-surfacing of dispersed oil from permitted discharges of produced water. The observation can be influenced by several factors, cloud, sunlight, weather, sea, and angle of view, height, speed and local features. The observer should be aware of these factors and try to make adjustments for as many as possible.

It is suggested that the ideal height to view the oil will vary from aircraft to aircraft. For example an Islander with its low speed allows observation at a lower level than a Merlin with its higher speed. For an aircraft with a speed of around 150 knots a height of around 210m – 300m (700 to 1000 feet) is suggested.

It is recommended that the slick should be viewed from all sides by flying a racetrack pattern around the oil. The best position to view the oil is considered to be with the sun behind the observer and the observer looking at the object / subject from an angle of 40^0 to 45^0 to the perpendicular.

The oil appearances will tend to follow a pattern. The thinner oils, sheen, rainbow and metallic, will normally be at the edges of the thicker oils, discontinuous true colour and true colour. It would be unusual to observe thick oil without the associated thinner oils; however, this can occur if the oil has aged and / or weathered.

During the observation the aircrew should estimate the areas within the overall area that have a specific oil appearance. The Bonn Agreement Oil Appearance Code (BAOAC).

Investigation – Photography

Photographs of the oil slick and polluter are probably the most easily understood data for a non-technical person. It is therefore essential to produce a complete set of pictures showing the required evidence.

The photographs can also confirm or amend the in-flight visual observation during the post flight analysis. The ideal set of photographs will show an overall, long range, view of the pollution and the polluter and a series of detailed close up, shots of the pollution and the polluter.

It is important, where possible; to show clear evidence of a connection between the polluter and the pollution, directly or indirectly, the camera data can provide this as can the IR and UV data. The data should also show 'clean' water ahead of the vessel so that the ship's crew cannot claim that the pollution was already there and they were 'just' sailing through it.

Volume Estimation – Overall Area Measurement

Trials have shown that both overall area and specific oil appearance area coverage measurement is the main source of error in volume estimation. Therefore observers should take particular care during this part of the volume estimation process.

Estimating or measuring the overall area can be done in several ways:

- Visual estimation
- Measurement of SLAR image
- Measurement of UV image

Estimations of overall slick area based on visual observations are likely to be less accurate than estimates based on measurements made of remote sensing images.

If possible, the whole slick should be visible in one image for ease of area measurement. Area calculations using accurate measurements of SLAR images will be more appropriate for large oil slicks, while measurements of UV images will be more suitable for smaller slicks.

Most modern SLAR systems incorporate electronic measuring devices; areas can be measured by drawing a polygon around the detected slick. It is recommended that these devices be used were at all possible as they are will provide the most accurate measurement within the confines of the aircraft during flight. Alternatively the overall length and width can be measured electronically and the overall coverage estimated visually.

It should be remembered that because of the resolution of the SLAR (generally 20 metres) small areas of less than 20 metres NOT covered with oil but within the overall area would not show on the SLAR. However, oil patches of less than 20 metres will show up as patches of 20 metres.

The recommended procedure for visual observation is to estimate the length and width of the slick by making time and speed calculations. This forms an imaginary rectangle that encloses the slick. The coverage of the oil slick (expressed as a percentage or proportion) within this imaginary rectangle is then used to calculate the overall area of the slick. Inevitable inaccuracies in dimension estimates and estimated coverage within these dimensions can give rise to high levels of error in area estimation.

Oil slicks frequently contain 'holes' of clear water within the main body of the slick, especially near the trailing edge of the slick. The proportion of the overall area that is covered by oil of any thickness needs to be estimated. For compact slicks, this proportion may be high at around 90% or more, but for more diffuse oil slicks a much lower proportion of the overall area will be covered in oil. More accurate assessments of overall slick area can be made by a more thorough analysis of the SLAR or UV images. The visual and SLAR overall area calculations should be 'adjusted' to take into account the 'holes' (areas) of clear water within the main body of the slick.

Volume Estimation – Specific Appearance Area Coverage Measurement

The 'adjusted' overall area covered with oil should be sub-divided into areas that relate to a specific oil appearance. This can be achieved using the recorded data from the vertical sensors and the noted visual observations.

This part of the volume estimation is mainly subjective so great care should be taken in the allocation of coverage to appearance, particularly the appearances that relate to higher thicknesses (discontinuous true colour and true colour). The vertical camera data (if available in flight) and the visual observations should be compared with the IR data, which will give an indication of the thickest part of the slick.

It is generally considered that 90% of the oil will be contained within 10% of the overall slick (normally the leading edge (up wind side) of the slick).

Thermal IR images give an indication of the relative thickness of oil layers within a slick. Relatively thin oil layers appear to be cooler than the sea and relatively thick oil layers appear to be warmer than the sea in an IR image. There is no absolute correlation between oil layer thickness and IR image because of the variable heating and cooling effects caused by sun, clouds and air temperature.

The presence of any area within the slick as warm in an IR image indicates that relative thick oil (Code 4 or 5 in the BAOAC) is present. Since these areas may only be small, but will contain a very high proportion of oil volume compared to the much thinner areas, their presence should be correlated with visual appearance in the BAOAC assessment.

The Volume Estimation Procedure is set out on Section C.6.

Post Flight Analysis

The aim of post-flight analysis / evaluation is to provide a more accurate estimate of spilled oil volume than can be made within the confines of the aircraft during flight. It is based on measured oil slick areas and the estimated oil layer thickness in various parts of the oil slick. It involves integrating the information from several different sources in a systematic way.

Electronic methods or the use of grid overlays should be used to obtain accurate measurements of overall slick area from the recorded images. Where several images have been obtained during a period of time, the area should be calculated for each one.

The next stage in post-flight analysis is to calculate oil coverage within the overall area estimated from visual observation or measured from the remote sensing images.

The photographs and Bonn Agreement Pollution Observation Log should be re-examined and the proportions of slick area of different BAOAC codes should be re-calculated. Any assessment of the appearance of different areas of oil within a slick will be somewhat subjective. Nevertheless, the BAOAC provides a standard classification system to allow at least semi-quantitative thickness (and subsequently, volume) estimation, particularly at lower oil thickness (Codes 1 to 3).

It is particularly important that areas of any thick oil (Codes 4 or 5 in the BAOAC) – if present – be confirmed as accurate or correlated with the thicker areas shown on the IR image, since these will have a very large influence on estimated volumes

The final stage of post flight analysis is to calculate the estimated volume by totalling the volume contributions of the different areas of the slick.

Volume estimations made by analysis of different sensors and methods should be compared. Similarly, volume estimates made from data obtained at different times should be compared to ensure that it is consistent; spilled oil volume would not normally change over a short time, so very different estimates obtained only a few minutes apart will be a signal of problems.

Oil Volume Estimate Usage

Using the BAOAC to estimate oil volume gives a maximum and minimum quantity. It is suggested that in general terms the maximum quantity should be used together with other essential information such as location to determine any required response action. It is suggested that the minimum volume estimate should be used for legal purposes

The appearances described cannot be related to one thickness; they are optic effects (codes 1 – 3) or true colours (codes 4 – 5) that appear over a range of layer thickness. There is no sharp delineation between the different codes; one effect becomes more diffuse as the other strengthens. A certain degree of subjective interpretation is necessary when using the code *and any choice for a specific thickness within the layer interval MUST be explained on the Bonn Agreement Pollution Observation Log*.

Description of the Appearances

Code 1 – Sheen (< 0.3 µm)

The very thin films of oil reflect the incoming light slightly better than the surrounding water and can therefore be observed as a silvery or grey sheen. All oils in these thin layers can be observed due to this effect and not the oil colour itself. Oil films below approximately 0.04 µm thickness are invisible. In poor viewing conditions even thicker films may not be observed. Above a certain height or angle of view the observed film may disappear.

Code 2 – Rainbow (0.3 µm – 5.0 µm)

Rainbow oil appearance represents a range of colours, yellow, pink, purple, green, blue, and red, copper, orange; this is caused by an optical effect and independent of oil type. Depending on angle of view and layer thickness, the distinctive colours will be diffuse or very bright.

Oil films with thicknesses near the wavelength of different coloured light, 0.2 µm – 1.5 µm (blue, 400nm or 0.4 µm, through to red, 700nm or 0.7 µm) exhibit the most distinct rainbow effect. This effect will occur up to a layer thickness of 5.0 µm. Bad light conditions may cause the colours to appear duller. A level layer of oil in the rainbow region will show different colours through the slick because of the change in angle of view. Therefore if rainbow is present, a range of colours will be visible.

Code 3 – Metallic (5.0µm – 50 µm)

The appearance of the oil in this region cannot be described as a general colour and is oil type dependent. Although a range of colours can be observed, blue, purple, red and greenish the apparent colour is not caused by interference of light or by the true colour of the oil. The colours will not be similar to 'rainbow'. Where a range of colours can be observed within a rainbow area, metallic will appear as a quite homogeneous colour that can be either blue, brown, purple or another colour. The 'metallic' appearance is the common factor and has been identified as a mirror effect, dependent on light and sky conditions. For example blue can be observed in blue-sky conditions.

Code 4 – Discontinuous True Colours (50 µm – 200 µm)

For oil slicks thicker than 50 µm the true colour will gradually dominate the colour that is observed. Brown oils will appear brown, black oils will appear black. The broken nature of the colour, due to thinner areas within the slick, is described as discontinuous. This is caused by the spreading behaviour under the effects of wind and current.

'Discontinuous' should not be mistaken for 'coverage'. Discontinuous implies true colour variations and not non-polluted areas.

Code 5 – True Colours (>200 µm)

The true colour of the specific oil is the dominant effect in this category. A more homogenous colour can be observed with no discontinuity as described in Code 4.

This category is strongly oil type dependent and colours may be more diffuse in overcast conditions.

TABLE C.1. THICKNESS BAND FOR ALLOCATION APPEARANCE

Code	Appearance	Approximate Thickness (µm)		Litres per km^2
		Minimum	Maximum	
1	Sheen (silver/grey)	0.04	0.3	40 – 300
2	Rainbow	0.3	5.0	300 – 5000
3	Metallic	5.0	50	5000 – 50,000
4	Discontinuous true colours	50	200	50,000 – 200,000
5	Continuous True Colour	200	> 200	200,000 - > 200,000

Source- the Bonn Agreement – Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances 1983 (updated September 2003).

By remote sensing – Alternatively, slick sizes can be estimated by deploying a dedicated oil spill surveillance aircraft fitted with remote sensing equipment. While some remote sensing techniques can be used at night, the aircraft operations are still weather dependant.

C.6 Volume Estimation Procedure

1. Overall Area Measurement

SLAR Polygon

Overall Area from SLAR Data 12 km^2

Length and Width (SLAR Image or Time and Distance)

Length – 12 km x Width – 2 km (Imaginary Rectangle)

Area Covered (within Imaginary Rectangle) – 50%

Overall Area 12 x 2 x 50% 12 km^2

2. Overall Area Covered With Oil Calculation

Percentage of Overall Area covered with oil 90%

Using UV imagery and Visual Observation

Overall Area Covered With Oil – 12 km^2 x 90% 10.8 km^2

3. Appearance Coverage Allocation

Appearance Code 1 (Sheen) 50%

Appearance 2 (Rainbow) 30%

Appearance 3 (Metallic) 15%

Appearance 5 (True Colour) 5%

4. Thickness Band for Allocated Appearance

Sheen 0.04 µm – 0.3 µm

Rainbow 0.3 µm – 5.0µm

Metallic5.0 µm – 50 µm

True Colour More than 200 µm

5. Minimum Volume Calculation

Overall Area x Area Covered with Specific Appearance x Minimum Thickness

Appearance 1 (Sheen)

10.8 km^2 x 50% x 0.04 µm = 0.216 m^3

Appearance 2 (Rainbow)

10.8 km^2 x 30% x 0.3 µm = 0.972 m^3

Appearance 3 (Metallic)

10.8 km^3 x 15% x 5.0 µm = 8.10 m^3

Appearance 5 (True Colour)

10.8 km^2 x 5% x 200 µm = 108.0 m^3

Minimum Volume = 0.216 + 0.972 + 8.10 + 108.0 = 117.288 m^3

6. Maximum Volume Calculation

Overall Area x Area Covered with Specific Appearance x Maximum Thickness

Appearance 1 (Sheen)

10.8 km^2 x 50% x 0.3 µm = 1.62 m^3

Appearance 2 (Rainbow)

10.8 km^2 x 30% x 5 µm = 2.7 m^3

Appearance 3 (Metallic)

10.8 km^3 x 15% x 50 µm = 81.0 m^3

Appearance 5 (True Colour)

10.8 km^2 x 5% x (more than) > 200 µm = > 108.0 m^3

Maximum Volume = 1.62 + 2.7 + 81.0 + > 108 = > 193.32 m^3

***Typical Conversions**

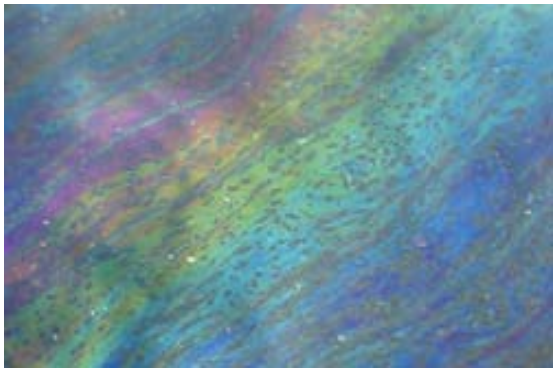
1 tonne = 7.45 bbls	**1 bbl = 42 US gallons**	**1 m^3 = 0.85 tonnes**

The amount of oil spilt should be estimated. If the source of the spill is known, then it may be possible to have a measure of the spill volume, depending upon the source characteristics (e.g. size of tank). If this is not possible then a rough estimate of the volume of oil in a slick may be judged by its size and appearance.

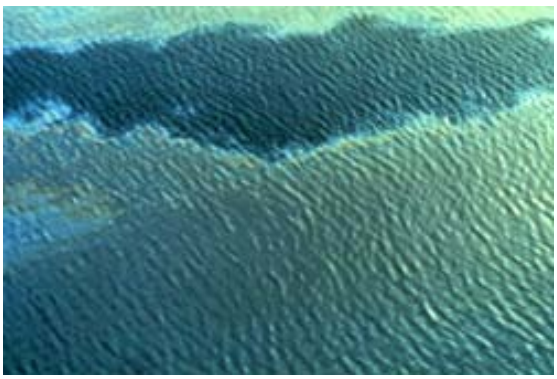
The oil, once positively identified, should be described and quantified. This is done by determining the area covered by the whole slick and by estimating the different thicknesses of oil from its colour and the area covered by each (sea Figure C.4 and Table C.1).

Figure C.6.1. Appearance of Oil

Code - 1 Silver sheen



Code 2 - Rainbow sheen



Code 3 - -Metallic

Code 4 – Discontinuous True Colour

The area covered by the slick is estimated from the time taken to travel over it at a given (ground) speed and the area of each colour in the slick estimated as a percentage cover.

Predicting Slick Movement

Computer Prediction of Slick Movement

Computer based slick predictions can be undertaken by the oil spill contractor (OSR). The computer model requires essential information that is entered into the Oil Spill Report Form (PON 1).

Manual Calculation of Slick Movement

Slick movement can be predicted manually to provide a rough guide to possible direction and speed of slick movement, which may assist in developing an appropriate response strategy. It should not be considered a substitute for visual monitoring of slick movement throughout the oil spill response in the field.

- The oil slick will move at approximately 3 percent of the wind speed and 100 percent of the current speed. Estimating slick movement and direction may be done manually by vector addition using an estimate of current speed and wind speed as indicated in the diagram and explained in the worked example.

Requirements

A protractor, a ruler, a sheet of graph paper, appropriate Admiralty chart for the relevant part of the North Sea.

Data:

- Wind speed and wind direction;
- Current speed and direction (use Admiralty Chart);
- Latitude and longitude of the spill location (use project co-ordinates provided in the summary sheet).

Construction of a Vector Diagram

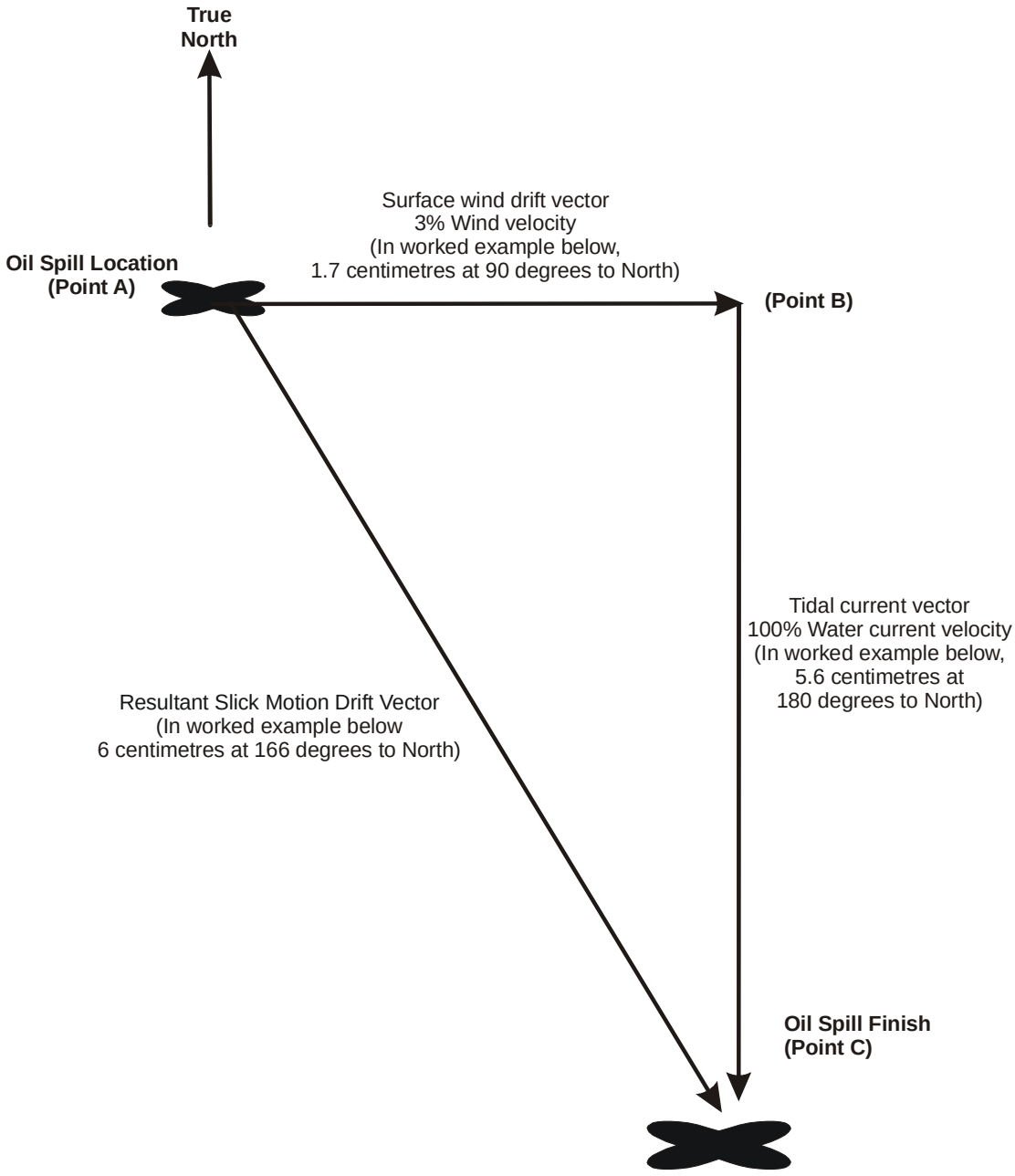
Use the same units and scale for the X axis (horizontal) and Y axis (vertical).

Units can be knots or kilometres per hour. (1 knot = 1.85 kilometres per hour)

Suggested Scale: 1 centimetre to 1 knot for high wind speeds or 10 centimetres to 1 knot for lower wind speeds (less than 20 knot).

- Plot the spill location on the graph paper (point A).
- On one axis, draw a line from A in the direction of the wind to represent the distance travelled by the slick in 1 hour at 3 percent of the wind speed (multiply the speed by 0.03 to give 3 percent of the wind speed) to point B. This is the Surface Wind Drift Vector.
- On the other axis draw a line from point B, the end of the Surface Wind Drift Vector in the direction of the current to represent the distance travelled by the slick in 1 hour at 100 percent of the current speed to point C. This is the Tidal Current Vector.
- Draw a line from A to where it intersects the Tidal Current Vector (point C). This is the Resultant Slick Motion Drift Vector.
- The length of the Resultant Slick Motion Drift Vector provides a value for the speed at which the slick is moving (or the distance moved in 1 hour). The angle of this line with the vertical axis of the graph, representing true north, (measured using the protractor) indicates the direction in which the slick is travelling.

Figure C.6.2. Movement of Spilt Oil at Sea



Plotting Slick Movement on the Admiralty Chart

The progressive movement of the oil slick should be plotted upon a chart.

- Mark the co-ordinates of the rig on the chart (54° 26.10’ North, 01°39’11.10”East).
- Convert the distance moved in one hour (obtained from the Resultant Slick Motion Drift Vector) to the same scale as the Admiralty chart.

- Draw a line (to scale) from the marked rig location at an angle equivalent to the direction of slick movement. Note the resultant co-ordinates of the slick, these represent the predicted position of the slick after one hour.
- A 24 hour prediction can be achieved by repeating steps 1 and 2 above for each hour, using the co-ordinates for the slick location as the starting point for the next iteration. The direction of the tidal current will need to be adjusted for each iteration.

Example

The wind speed is 30 knots and is blowing from the West.

A West wind blows from 270 degrees

The slick moves towards 270 degrees – 180 degrees = 90 degrees

30 knots = 30 x 1.85 kilometres per hour

= 55.5 kilometres per hour

Adjusted for 3 percent of the wind speed = 55.5 x 0.03

= 1.7 kilometres per hour

On a scale of 1 centimetre to 1 kilometre per hour plotted for a 1 hour period:

1 centimetre represents 1 kilometre.

1 x 1.7 = 1.7 centimetre represents 1.7 kilometre

The Surface Wind Drift Vector is drawn as a 1.7 centimetre line at an angle of 90 to the vertical axis.

The current speed is 3 knots and is flowing to the South.

A southerly current moves towards 180 degrees

3 knots = 3 x 1.85 kilometres per hour

= 5.6 kilometres per hour

On a scale of 1 centimetre to 1 kilometre per hour, plotted for a 1 hour period:

1 centimetre represents 1 kilometre.

1 x 5.6 = 5.6 centimetre represents 5.6 kilometres.

The Tidal Current Vector is drawn from the end of the Surface Wind Drift Vector as a 5.6 centimetres line at an angle of 180 degrees to the vertical axis.

From a vector diagram of the above:

The length of the Resultant Slick Motion Drift Vector = 6.0 centimetres and is at angle of 166 degrees to the vertical axis.

Therefore it is predicted that in 1 hour the slick will move 6.0 kilometres in a South South-East direction (towards 166 degrees).

The Admiralty chart has a scale of 1:200,000.

1 centimetre on the chart represents 200,000 centimetres = 2 kilometres.

The line drawn on the chart will be 1 centimetre x (6.0 kilometres / 2 kilometres) = 3.0 centimetres at an angle of 166 degrees.

Oil Spill Movement

Oil spill movement can be modelled to predict the movement and fate of spilt oil and to 'monitor' the slick when not under direct observation. This can be done by the oil spill contractor, OSR, using the OSIS and/or the Oil Map models.

For this purpose, the following **essential information** is required;

- the date and time of the spill;
- the type of oil;
- amount of oil;
- spill location (latitude and longitude);
- current and forecast weather;
- air and water temperature (if available) and;
- location of environmental sensitivities.

The models contain the relevant tidal data and a database of the characteristics of different oils. The output from the model will be a map showing the location of the slick at any desired time and data about the oil indicating the rate of oil dispersion and oil viscosity. This can also indicate the likelihood of the oil being amenable to chemical dispersion.

C.7 Natural Dispersion

If the oil slick does not immediately threaten any sensitivity or resource and prediction methods show that the oil will disperse by itself, then a valid response strategy is to monitor the oil slick until it disperses naturally. The future movement and behaviour of the oil should be predicted, as far as possible, using weather forecasts and computer modelling, until it has completely dispersed. Oil on the sea should be monitored by direct observation.

Weathering

As soon as oil is spilt to the sea, it is subject to a number of weathering processes which act simultaneously. Their relative importance varies with the properties of the oil and the prevailing environmental conditions. Its ultimate fate is to be biodegraded/oxidised, chiefly into carbon dioxide and water. The weathering agents are spreading, evaporation, dissolution, dispersion, emulsification, sedimentation, photo-oxidation and bio-degradation (Figure C.6). For diesel and

condensate the most important of these are **spreading** on the sea surface, **evaporation** and **dispersion** (see Table C.2).

Figure C.7.1. Fate of Oil Spilt at Sea (ITOPF)

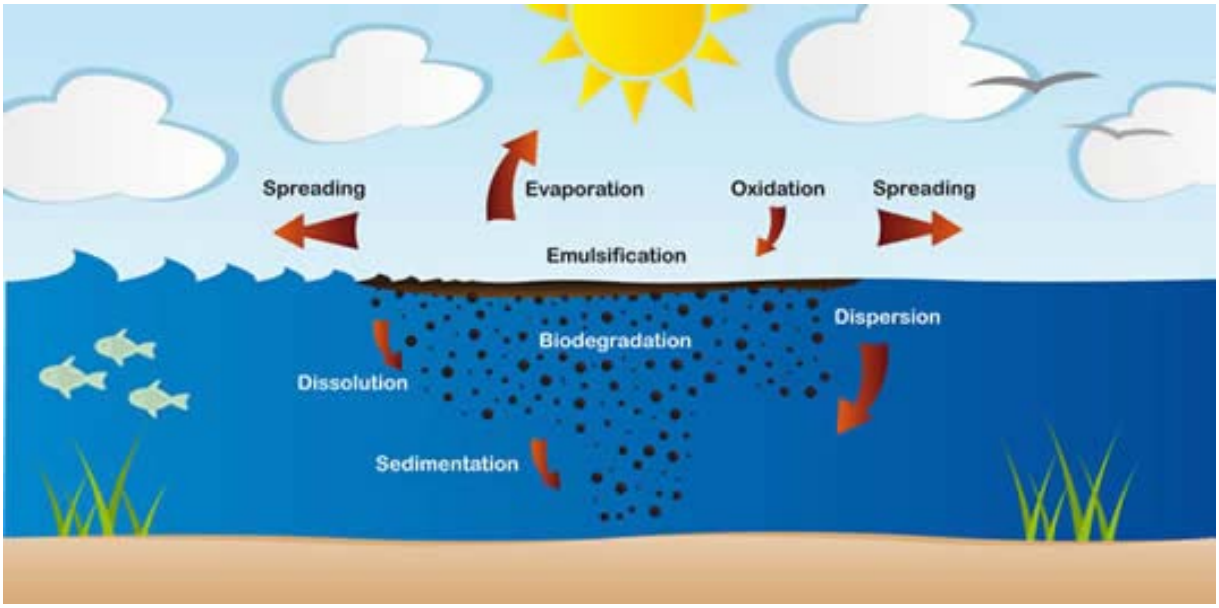


TABLE C.2. FATE OF SPILT OIL IN THE MARINE ENVIRONMENT				
Weathering Agent	**Description**	**Rate and contribution to slick removal**	**DIESEL**	**CRUDE**
Spreading	Oil will tend to spread out on the surface of the water. The rate and degree to which it does it will depend upon the viscosity of the oil and the surface tension between the oil and the water. The higher the temperature, the lower the viscosity and the greater the degree and speed of spreading. Under the influence of wind the oil will become unevenly distributed. It will tend to break up into patches or ribbons, thickest in the leading edge and thinnest at the trailing edge.	Rapid cover of large areas.	Very rapid spreading.	Rapid spreading.
Evaporation	Evaporation will remove the more volatile molecules from the surface of the oil slick into the atmosphere. It will act fastest when there is a large surface area of oil exposed to the air and will increase with temperature. It will be more predominant when the proportion of lighter to heavier molecules in the oil is high and the energy in the sea and atmosphere is high (rough conditions).	Rapid, particularly for lighter oils. It may account for 10 – 75% of removal of oil from the sea surface depending upon the initial type.	Major means of removal.	Initially dominant means of removal.
Dissolution	The soluble elements of the oil (the lighter molecules) will preferentially be removed from the slick into the water column and they will subsequently be diluted by dispersion. Aided by high energy in the sea.	Active soon after a spill occurs, but overall it is a relatively minor pathway.	Can be important.	Can be important.
Dispersion	The oil layer on the surface of the sea is broken into small droplets which then disperse into the water column. The rate at which this occurs and the degree to which it occurs will depend upon the composition of the oil. Aided by high energy in the sea.	An important process for removing oil from the surface and facilitating bio-degradation. Most important for the less viscous oils.	Important.	Important.
Photolysis	Light energy acting upon oil breaks chemical bonds in the hydrocarbon chains and allows it to slowly oxidise. Aided by high levels of irradiation.	Negligible over the short term in high northern latitudes however important in the long term and lower latitudes.	Important.	Important.

Bio-degradation	Biodegradation is the ultimate means of removal of free oil from the environment. Aided by ample nutrient supply, dispersion of oil, moderate temperatures high energy environment.	Minor importance in the short term but very important in the long term.	Not important.	Important in long term.
Drift	Drift of the oil slick is facilitated by wind, waves and surface water currents.	Important in distributing oil and moving it into or out of sensitive areas.	Can be important.	Important.

Diesel is a low viscosity distillate fuel made from light gas oil. Typically it has a density of 0.846 kilograms per litre and a gravity of 38° API. It contains a high proportion of light ends and so evaporation will play an important part in the removal of the oil from the surface of the sea. Spill evaporation rate will depend on the volume and rate of spill.

Crude (e.g. 39° API), accompanied by associated gas comprises the reservoir fluids; this is an ITOPF, Group 2 crude with limited persistence. All slicks would be expected to have a limited duration however modelling indicates that spills of 10 tonnes or more could reach the shore with persistent, strong onshore winds.

Lube and hydraulic oils are refined products. They have no light ends and behave as viscous oil. Evaporation will be limited and spreading relatively slow however they are dispersed rapidly by natural wave action. Aviation fuel is a refined distillate hydrocarbon fuel and more volatile than diesel. It will evaporate quickly.

C.8 Chemical Dispersion

Chemical dispersants are applied as a spray to floating oil to speed up the breakup of surface oil slicks into small droplets that disperse into the water column. The amenability of the oil to dispersion should be tested by shaking a sample of oil and water in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample is effectively dispersed. MoEW, have issued the following guidance on their use:

Shallow Water

Approval from MOEW must be obtained prior to any use of dispersants or other oil treatment products in an area of sea which is less than 20 metres deep or within 1 kilometre of any such area or the shoreline. It is not sufficient to advise MoEW after use or consult MoEW about use - **MoEW approval must be received before such products are used in such shallow water.** The only exception is *force majeure* circumstances where it is necessary to use dispersants to protect the installation, vessels, or personnel who are at risk from the spill.

Deep Water (i.e.: at least 1 kilometre outwards from the 20 metre contour or the shoreline)

It is the policy of the MoEW that they should be consulted in advance on all proposals to use oil dispersants except in circumstances where a spill poses an immediate threat to human health or the safety of an installation." MoEW therefore request to be consulted before dispersants are used unless there are *force majeure* circumstances.

Spills of Gasoline, Kerosene and Diesel

The general view of the MoEW is that chemical dispersants should **not** be used on spilled gas oil or diesel fuel, for two reasons. Firstly, the natural processes of evaporation and dispersion will usually rapidly remove these oils from the sea surface without the need for chemical treatment. Secondly, chemical dispersion of these light oils will result in increased concentrations of toxic components within the upper water column.

Sometimes it is suggested that chemical dispersion of diesel, which is observed not to be dispersing naturally, might be necessary in order to protect seabirds. It is agreed that this may be an appropriate response, but, as always, it is a question of balancing one outcome against another. Many spawning species have pelagic eggs and/or larvae which are vulnerable to oil which is chemically dispersed into the water column. Inevitably they would become exposed to higher oil concentrations if dispersants were used than would be the case if the oil had been allowed to disperse naturally.

In the unlikely event that any spilled diesel oil does not disperse naturally, chemical dispersion can be considered, but this should only take place with the agreement of MoEW. MoEW will consult with their own scientific advisors and the relevant staff within MoE before making a decision. This will ensure that any decision on the use of dispersant is based on the most up-to-

date information on both spawning fish populations and seabirds, thereby minimising any environmental impact.

Once in the form of small droplets, the surface area of oil open to attack by biodegrading agents is vastly increased. Dispersants work as wetting agents whose molecules are part hydrophilic and part oleophilic. On amenable oils (of viscosity of less than 2000 centistokes or so) this has the effect of reducing the surface tension in the oil and makes it more amenable to breaking up into small droplets. The hydrophilic nature of the molecules makes the oil droplets more likely to disperse in to the water column and less likely to float. The lowering of the surface tension in the oil also makes it less likely that the oil will form an emulsion with water. In its turn this can reduce the time that oil will take to naturally disperse and can therefore reduce the threat to the environment. In order to function, the dispersant must be delivered onto the surface of the oil and the oil must then be subjected to a degree of natural or artificial agitation, to break the oil film up.

Dispersants must be delivered onto the surface of the oil as droplets, which will mix with the oil for long enough for them to take effect. This can be achieved from surface vessels equipped with a dispersant application system, or by an aerial delivery system, helicopter or borne by aeroplane. Specialist equipment for this function is commercially available for hire or direct purchase.

To function effectively the dispersant must be applied to the oil in the correct ratio of dispersant to oil. Normally the ratio used is 1:20, that is one volume of dispersant to twenty volumes of oil. The ratio chosen will depend upon the technical details of the dispersant being used (see manufacturer's recommendations), the amount and type of oil to be dispersed and its state of weathering. For example during the Sea Empress incident in the UK, following close monitoring of the response and its effectiveness, it emerged that the dispersant was effectively dispersing the oil at a ratio of 1:60. This high rate efficacy demonstrates the benefits that can accrue with a combination of favourable environmental conditions and a well conducted operation. The key points being:

- Using dispersant upon an oil on which it is effective;
- Treating freshly spilt, un-weathered oil;
- Accurate targeting of the oil slicks for treatment;
- Optimal wind speed for enhanced dispersion of oil.

Dispersed oil in the water column increases the amount of oil, in droplets, in the first few metres below the surface. Sometimes this is visible as a characteristic plume spreading from the surface downwards. Studies have shown that despite the absence of the visible plume there may still be elevated oil concentrations below the surface following the use of dispersants, indicating that they are working. The toxic exposure of marine organisms to this oil has been demonstrated to have an effect at a concentration of more than 10 parts per million of dispersed oil with an exposure time of from two to four hours. Where rapid dilution of the dispersed oil is not

possible then dispersant should not be used, for example in sheltered bays shallow water. In open water dilution normally ensures that this toxic concentration is rarely exceeded for any significant length of time.

The relatively high toxicity of dispersed diesel in the water column means that there is no net environmental benefit to be achieved by the use of chemical dispersant on it. Chemical dispersant would therefore only be used on diesel if life or the installation was threatened. Dispersant use is therefore subject to certain limitations imposed by the nature of the oil to be dispersed, the delivery system and the weather conditions (Table C.4):

TABLE C.4. LIMITING FACTORS FOR DISPERSANT APPLICATION

Constraint	Limits	Reference
Visibility (for aircraft delivery)	daylight hours (visibility > 5 nm)	IOE 1991,
Wind speed	Beaufort Force 4-5 (22 – 33 knots)	CONCAWE 1988, IP 1987, Mackay et al 1986, IOE 1991
Wave height	0.5-2.5 m	Kvam 1986, IOE 1991
Oil viscosity	<2000 mPa	CONCAWE 1988, IP 1987, MPCU personal communication

The amenability of the oil to dispersion should be tested by shaking a sample of oil and water in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample is effectively dispersed.

C.9 Dispersant Operations Evaluation Checklist

1 Do you expect the use of dispersants in this case to provide an environmental benefit?

Review trajectory and environmental fate analysis.

YES ( ) GO TO SECTION 2 BELOW

NO ( ) GO TO SECTION 11 BELOW

2 Plot the position of the spill on the appropriate nautical chart; draw a circle about the spill source with a 10 nautical mile radius as a worst-case scenario for surface movement. Hash mark any area within the circle that is in waters less than 20 meters deep or 1 nautical mile from shore.

What is left is considered the dispersant operational area.

Is the dispersant operational area to be in offshore water that is no less than 20 meters deep and at least 1 nautical mile from the nearest shoreline?

YES ( ) GO TO SECTION 3 BELOW

NO ( ) GO TO SECTION 9 BELOW

3 Was a contractual relationship with a dispersant spray contractor established prior to the spill?

YES ( ) GO TO SECTION 4 BELOW

NO ( ) GO TO SECTION 9 BELOW

4 Dispersant Platform

Considering the amount of oil spilled, the location of the operational area, volume of available dispersants to be used, and the timeframe in which the required equipment can be on-scene, what is the most effective application platform? More than one platform type may be considered.

If Aerial GO TO SECTION 5 BELOW

If Boat GO TO SECTION 6 BELOW

If Other GO TO SECTION 7 BELOW

5 Aerial Application Operational Conditions

5-A If on-scene weather was available from the spiller on initial telephone contact use that information to complete this section and assume for planning purposes that it

will remain the same during the timeframe in which this decision is operating. At the earliest opportunity, obtain a detailed weather forecast, but do not delay this decision process for the weather input (Note: All dispersant operations are carried out during daylight hours only).

Winds less than or equal to 25 knots, and

Visibility greater than or equal to 3 nautical miles, and

Ceiling greater than or equal to 1,000 feet?

YES ( ) GO TO SECTION 8 BELOW

NO ( ) GO TO [5-B] IN THIS SECTION BELOW

5-B Notify the spiller's representative that the dispersant use decision has been delayed until the weather improves, and that the Dispersant Spray Operation is to be placed on a standby status. When the sea state is beginning to improve:

BEGIN AGAIN IN SECTION 2 ABOVE

6 Boat Application Operational Conditions

6-A If on-scene weather was available from the spiller on initial telephone contact use that information to complete this section and assume for planning purposes that it will remain the same during the timeframe in which this decision is operating. At the earliest opportunity, obtain a detailed weather forecast, but do not delay this decision process for the weather input (Note: All dispersant operations are carried out during daylight hours only).

Wave height such that the boats to be used for the dispersant application can conduct an effective and safe spray operation?

YES ( ) GO TO SECTION 8 BELOW

NO ( ) GO TO [6-B] IN THIS SECTION BELOW

6-B Notify the spiller's representative that the dispersant use decision has been delayed until the sea state improves, and that the Dispersant Spray Operation is to be placed on a standby status. When the sea state is beginning to improve:

BEGIN AGAIN IN SECTION 2 ABOVE

7 Immediately consult with the Scientific / Environmental Advisor to evaluate potential alternatives to the Aircraft and Boat Platforms.

7-A After a briefing on the spill response situation from the OSC, does the Scientific / Environmental Advisor recommend aerial application of Dispersants?

YES ( ) GO TO SECTION 5 ABOVE

NO ( ) GO TO [B] IN THIS SECTION BELOW

7-B After a briefing on the spill response situation from the OSC, does the Scientific / Environmental Advisor recommend boat application of Dispersants?

YES ( ) GO TO SECTION 6 ABOVE

NO ( ) GO TO [C] IN THIS SECTION BELOW

7-C After a briefing on the spill response situation from the OSC, does the Scientific / Environmental Advisor an alternative platform?

YES ( ) DEVELOP A PLAN AND GO TO SECTION 8 BELOW

NO ( ) GO TO SECTION 11 BELOW

8 Is the dispersant to be used approved for use in Lebanese waters and considered appropriate for existing environmental and physical conditions?

YES ( ) GO TO SECTION 10

NO ( ) GO TO SECTION 9

9 **GO NO FURTHER IN THIS DISPERSANT USE CHECKLIST**. The request for dispersant use does not qualify under the guidelines for pre-approval use of dispersants in Lebanon.

10 Dispersibility

Does the available technical information suggest that dispersion is likely given the spilled oil, anticipated oil weathering, and selected dispersant?

YES ( ) GO TO 12 BELOW

NO ( ) GO TO 11 BELOW

11 **GO NO FURTHER IN THIS DISPERSANT USE CHECKLIST.** In this case dispersant use is either inappropriate for this response or will probably not be considered to be effective relative to the effort required.

Concentrate your efforts on Mechanical and/or in-situ burn operations

Note: You may want to consider dispersant pre-approval use at a later time if the field situation changes (i.e., becomes a continuous spill or has a new instantaneous

release.) In such an event, return to the start of this checklist.

12 **INITIATE APPLICATION OF DISPERSANTS WITHIN THESE GUIDELINES**.

- Water depth ≥ 20 meters and no less than 1 nautical mile from nearest shoreline.
- The dispersant spray controller/observer should be over the spray site before the start of the operation. If possible, an approved marine mammal/turtle and pelagic/migratory birds survey specialist will accompany the observer, but the operation will not be delayed for that individual.
- Personal protective equipment for personnel on-site will conform to the appropriate dispersant's MSDS
- If dispersant platform is an aircraft, spray aircraft will maintain a minimum 1000-foot horizontal separation from rafting flocks of birds. Caution will be taken to avoid spraying over marine mammals and marine turtles.
- If dispersant platform is a boat:
- If the system involves spray arms or booms that extend out over the edge of the boat and have fan type nozzles that spray a fixed pattern of dispersant, the following ASTM standards apply:
- **ASTM F 1413-92** Standard Guide for Oil Spill Dispersant Application Equipment: Boom and Nozzle Systems.
- **ASTM F 1460-93** Standard Practice for Calibrating Oil Spill Dispersant Application Equipment Boom and Nozzle Systems.
- **ASTM F 1737-96** Standard Guide for Use of Oil Spill Dispersant Application Equipment During Spill Response: Boom and Nozzle Systems.
- If the system involves the use of a fire monitor and or fire nozzle to apply the dispersants, a straight and narrow "firestream" flow of dispersant directly into the oil is to be avoided.

If an alternative dispersant platform is used, the Operation Plan should include dispersant application guidelines

GO TO SECTION 13 BELOW

13 The MOEW must be kept informed on the status of the dispersant application throughout the operation. Provided the dispersant application is successful and operational results are positive, no MOEW approval will be required for additional sorties and passes

GO TO SECTION 14 BELOW

14 At the completion of the dispersant operation, send the following to the MOEW representative:

- This completed Checklist
- A one page summary of the operation to date
- Other information as necessary

Provide the MoEW post-application information/results within 24 hours of the dispersant application.

Follow-up operation by insuring that flight logs and observer logs are secured should MoEW request additional documentation.

C.10 Mechanical Containment and Recovery

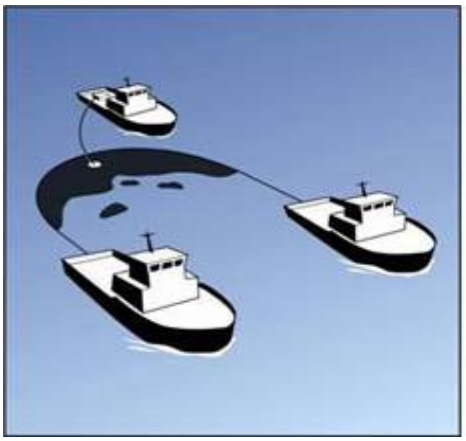
Mechanical containment and recovery is made up of a chain of operations consisting of:

- Containment with some form of boom;
- Mechanical recovery with a skimming device or adsorbent;
- Temporary storage and transport of recovered oil;
- Treatment, disposal or use of recovered oil.

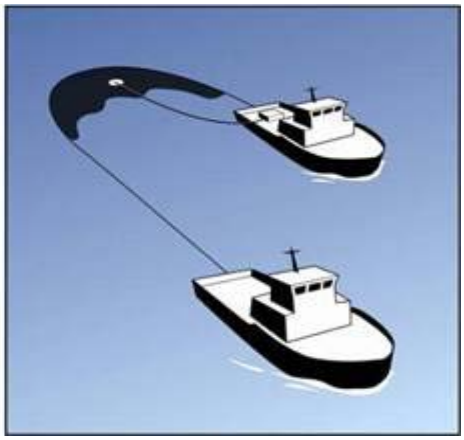
Mechanical containment of oils involves containing all or part of the oil slick by deploying a boom from the response craft. The boom will form a barrier containing the oil floating on the surface of the water against the tendency of oil to spread and to drift. The boom must be attached at each end to a vessel or anchored. There are a variety of different booms available for use in different circumstances, each being designed, as far as possible, to overcome the problems associated with a particular environment. The physical factors limiting the use of booms are that they cannot be deployed when wind and sea conditions are too rough and they cannot be held against a water current of more than 0.7 metres per second. The physical barrier of the boom will fail to hold oil if waves are too high, allowing oil to escape over the top or by entrainment if the current is too strong, allowing oil to escape beneath.

Offshore recovery, typically requires two or more vessels to which are attached the ends of the boom to hold it stationary or tow it into the wind in either a U or J configuration (Figure C.7) The oil is recovered using a skimmer deployed by a third vessel, or by the vessel at the ‘base of the J’, where the oil will tend to accumulate at its thickest. There are a variety of different types and models of skimmers, each of which will function best in a certain set of conditions (see Table C.6). The recovered oil, normally mixed with some water, is then pumped to some form of tank for storage and transport.

Figure C.8 Offshore recovery boom and vessel 'U' and 'J' configurations (OSR/EARL, 2006)



U configuration – 2 x towing vessels, 1 x recovery vessel



J configuration – 1 x towing vessel, 1 x towing and recovery vessel

The oil must then be transported to shore for final use or disposal. To prevent a recurrence of the pollution the storage location must be robust enough to allow transport ashore for disposal. There are a variety of temporary storage systems available, pillow tanks, or tankers. These must be appropriately rated for the job in hand and must be used within their limitations. Tankers used for storing oil must be rated according to Merchant Shipping notes M1663. In practice the amount of oil which is generally recovered at sea is only a small percentage of the amount spilled. This is due to the great physical difficulties of carrying out a difficult operation in an uncontrolled environment and due to the limits of the containment and the recovery systems. Acknowledging this, any oil that can be recovered, will reduce the potential for the oil slick to cause damage to the environment and is therefore useful.

TABLE C.5. PHYSICAL LIMITATIONS OF BOOMS FOR CONTAINMENT		
Constraint	**Limits**	**Reference**
Visibility	Daylight hours	IOE, 1991
Wave Height	< 2.0m (conservatively)	IOE, 1991, Schulze, 1993; BMES/OSR Personal communication
Water Current	Daylight hours < 0.7m/s (1.35 kt) normal to the boom	CONCAWE, 1981; Schulze, 1993; OSR Personal communication

TABLE C.6. PHYSICAL LIMITATIONS OF SKIMMERS				
Skimmer	**Type of Oil**	**Capacity**	**Weather**	**Observations**
Disc skimmers	All kinds of oil, poor efficiency in emulsions	10-400m^3/h collect 10-60% water with the oil	Claimed up to Beaufort Force 4-5 (1-3m waves)	Installed on board ship or a floating unit, best used with booms
Band skimmers	Work in non viscous oils	10-300m^3/h 10-50% water with the oil	Efficient in calm water, low efficiency in waves	Tow speed is 1-2 knots max. The band can suffer from tearing with the presence of solids and too high towing speed
Vortex skimmers	All oils except viscous oil and emulsion	10-700m^3/h 20-60% of water is recovered	Used with waves up to 1.5m	Must be towed by ship or fixed to the boats hull. To be efficient the apparatus must be towed at 1-8 kts.
Skimming barrier	All oils except highly viscous emulsions	100-2700m^3/day	Efficiency reduces with waves >0.5m	Must be towed at speed sufficient to ensure adequate thickness of oil reaches pump

C.11 Onshore Oil Spill Clean-up

If sea conditions prevent intervention at sea and the oil reaches the coast, the principal factors to consider during an onshore clean-up operation are:

- Environmental sensitivity;
- Good communications and planning;
- A suitable clean-up method for each length of coast;
- The length of contaminated coast line;
- The volume of oil to clean-up;
- The access route to the areas to be cleaned and

- Temporary storage of contaminated materials and liquid oil.

Shorelines have varying degrees of vulnerability to oil spills and the clean-up techniques must be selected accordingly.

Where clean-up or coastal protection is recommended, the following options are available:

- Booms to protect specific areas or to contain oil;
- Skimmers to remove oil from the water near the shore;
- Cold/hot water hoses to wash down beaches;
- Dispersant treatment of beached oil at low tide (only with MMO approval);
- Bioremediation in situ (only with MMO approval);
- Physical removal of oil and contaminated debris; or
- Natural degradation of oil.

The clean-up option should be chosen in relation to shore type (Table C.7). Advice should be sought from experts and conservation agencies. Environmental sensitivities may vary throughout the year and change accordingly. Particular attention needs to be paid to these together with organisation of teams, temporary storage of oil and debris and access routes to shore. Local authority Plans should include the following:

- The areas where the oil should be left and monitored;
- The areas or conditions under which the oil should be dispersed;
- The areas where the spill should be recovered mechanically;
- The areas which should be given priority for protection by booms;
- The location of temporary storage pits and treatment areas for oiled debris and oily water.

In practice, any inshore clean-up operations will be conducted in close consultation with the appropriate local authority, to ensure that existing priorities can be met and an effective clean-up operation executed.

C.12 Mechanical Containment and Recovery

Mechanical containment and recovery is made up of a chain of operations consisting of:

- Containment with some form of boom;
- Mechanical recovery with a skimming device or adsorbent;
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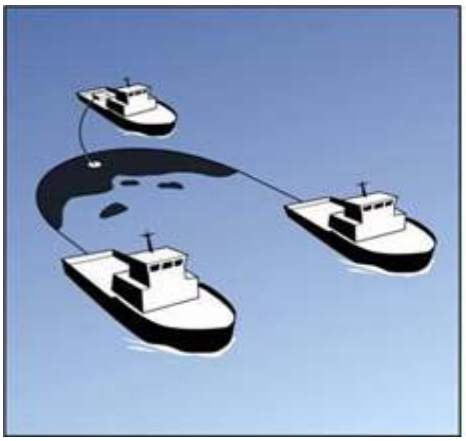
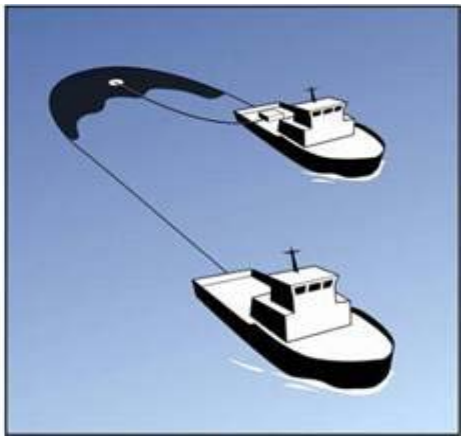


U configuration – 2 x towing vessels, 1 x recovery vessel



J configuration – 1 x towing vessel, 1 x towing and recovery vessel

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- Booms to protect specific areas or to contain oil;
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- Bioremediation in situ (only with MMO approval);
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The clean-up option should be chosen in relation to shore type (Table C.7). Advice should be sought from experts and conservation agencies. Environmental sensitivities may vary throughout the year and change accordingly. Particular attention needs to be paid to these together with organisation of teams, temporary storage of oil and debris and access routes to shore. Local authority Plans should include the following:

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- The areas where the spill should be recovered mechanically;
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- The location of temporary storage pits and treatment areas for oiled debris and oily water.

In practice, any inshore clean-up operations will be conducted in close consultation with the appropriate local authority, to ensure that existing priorities can be met and an effective clean-up operation executed.

TABLE C.7. LIMITING FACTORS FOR DISPERSANT APPLICATION

Vulnerability Index	Shoreline type	Comments
1	Exposed rocky shores	Wave reflection keeps most of the oil offshore. No cleaning necessary.
2	Eroding wave cut platforms	Wave swept. Most oil removed by natural processes within weeks.
3	Fine grained sand beaches	Oil does not usually penetrate far into the sediment, facilitating mechanical removal if necessary. Oil may persist for several months.
4	Coarse grained sand beaches	Oil may sink or may be buried rapidly, making clean-up difficult. Under moderate to high energy (> sea state 4 or 5) conditions the oil will be removed naturally within months from most of the beach face.
5	Exposed compacted tidal flats	Most oil will not adhere to or penetrate into the compacted tidal flat; clean-up usually unnecessary.
6	Mixed sand and gravel	Oil may undergo rapid penetration and burial; under moderate to low energy conditions oil may persist for years.

7	Gravel beaches	As for 6. A solid asphalt pavement may form under heavy oil accumulations.
8	Sheltered rocky coast	Areas of reduced wave action; oil may persist for many years. Clean-up is not recommended unless oil accumulation is very heavy.
9	Sheltered tidal flat	Areas of low wave energy and high biological productivity; oil may persist for many years. Clean-up is not recommended unless oil accumulation is very heavy. These areas should receive priority protection by using booms or oil-adsorbent materials.
10	Salt marsh.	Most productive of aquatic environments; oil may persist for many years. These areas should receive priority protection by using booms or oil-adsorbent materials. Seek advice from appropriate conservation organisations.

APPENDIX D: RESOURCES

APPENDIX E: LEGAL

E.1 Barcelona Convention

Convention for the Protection Of The Mediterranean Sea Against Pollution

Signed 16 February 1976, in force 12 February 1978 (revised in Barcelona, Spain, on 10 June 1995 as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean)

Revised text

The Contracting Parties,

Conscious of the economic, social, health and cultural value of the marine environment of the Mediterranean Sea area,

Fully aware of their responsibility to preserve this common heritage for the benefit and enjoyment of present and future generations,

Recognizing the threat posed by pollution to the marine environment, its ecological equilibrium, resources and legitimate uses,

Mindful of the special hydrographic and ecological characteristics of the Mediterranean Sea area and its particular vulnerability to pollution,

Noting that existing international conventions on the subject do not cover, in spite of the progress achieved, all aspects and sources of marine pollution and do not entirely meet the special requirements of the Mediterranean Sea area,

Realizing fully the need for close co-operation among the States and international organizations concerned in a co-ordinated and comprehensive regional approach for the protection and enhancement of the marine environment in the Mediterranean Sea area,

Have agreed as follows:

Article 1

GEOGRAPHICAL COVERAGE

1. For the purposes of this Convention, the Mediterranean Sea area shall mean the maritime waters of the Mediterranean Sea proper, including its gulfs and seas, bounded to the west by the meridian passing through Cape Spartel lighthouse, at the entrance of the Straits of Gibraltar, and to the east by the southern limits of the Straits of the Dardanelles between the Mehmetcik and Kumkale lighthouses.
2. Except as may be otherwise provided in any Protocol to this Convention, the Mediterranean Sea area shall not include internal waters of the Contracting Parties.

Article 2

DEFINITIONS

For the purposes of this Convention:

a) 'Pollution' means the introduction by man, directly or indirectly, of substances or energy into the marine environment resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities.

b) 'Organization' means the body designated as responsible for carrying out secretariat functions pursuant to Article 13 of this Convention.

Article 3

GENERAL PROVISIONS

1. The Contracting Parties may enter into bilateral or multilateral agreements, including regional or sub-regional agreements, for the protection of the marine environment of the Mediterranean Sea against pollution, provided that such agreements are consistent with this Convention and conform to international law. Copies of such agreements between Contracting Parties to this Convention shall be communicated to the Organization.

2. Nothing in this Convention shall prejudice the codification and development of the law of the sea by the United Nations Conference on the Law of the Sea convened pursuant to resolution 2750 C (XXV) of the General Assembly of the United Nations, nor the present or future claims and legal views of any State concerning the law of the sea and the nature and extent of coastal and flag State jurisdiction.

Article 4

GENERAL UNDERTAKINGS

1. The Contracting Parties shall individually or jointly take all appropriate measures in accordance with the provisions of this Convention and those Protocols in force to which they are party, to prevent, abate and combat pollution of the Mediterranean Sea area and to protect and enhance the marine environment in that area.

2. The Contracting Parties shall cooperate in the formulation and adoption of Protocols, in addition to the protocols opened for signature at the same time as this Convention, prescribing agreed measures, procedures and standards for the implementations of this Convention.

3. The Contracting Parties further pledge themselves to promote, within the international bodies considered to be competent by the Contracting Parties, measures concerning the protection of the marine environment in the Mediterranean Sea area from all types and sources of pollution.

Article 5

POLLUTION CAUSED BY DUMPING FROM SHIPS AND AIRCRAFT

The Contracting Parties shall take all appropriate measures to prevent and abate pollution of the Mediterranean Sea area caused by dumping from ships and aircraft.

Article 6

POLLUTION FROM SHIPS

The Contracting Parties shall take all measures in conformity with international law to prevent abate and combat pollution of the Mediterranean Sea area caused by discharges from ships, and to ensure the effective implementation in that area of the rules which are generally recognized at the international level relating to the control of this type of pollution.

Article 7

POLLUTION RESULTING FROM EXPLORATION AND EXPLOITATION OF THE CONTINENTAL SHELF AND THE SEABED AND ITS SUBSOIL

The Contracting Parties shall take all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea area resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil.

Article 8

POLLUTION FROM LAND-BASED SOURCES

The Contracting Parties shall take all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea area caused by discharges from rivers, coastal establishments or outfalls, or emanating from any other land-based sources within their territories.

Article 9

COOPERATION IN DEALING WITH POLLUTION EMERGENCIES

1. The Contracting Parties shall co-operate in taking the necessary measures for dealing with pollution emergencies in the Mediterranean Sea area, whatever the causes of such emergencies and reducing or eliminating damage resulting therefrom.
2. Any Contracting Party which becomes aware of any pollution emergency in the Mediterranean Sea area shall without delay notify the Organization and, either through the Organization or directly, any Contracting Party likely to be affected by such emergency.

Article 10

MONITORING

1. The Contracting Parties shall endeavour to establish, in close co-operation with the international bodies which they consider competent, complementary or joint programmes, Including, as appropriate, programmes at the bilateral or multilateral levels, for pollution monitoring in the Mediterranean Sea area and shall endeavour to establish a pollution monitoring system for that area.
2. For this purpose, the Contracting Parties shall designate the competent authorities responsible for pollution monitoring within areas under their national jurisdiction and

shall participate as far as practicable in international arrangements for pollution monitoring in areas beyond national jurisdiction.

3. The Contracting Parties undertake to cooperate in the formulation, adoption and implementation of such Annexes to this Convention as may be required to prescribe common procedures and standards for pollution monitoring.

Article 11

SCIENTIFIC AND TECHNOLOGICAL CO-OPERATION

1. The Contracting Parties undertake as far as possible to co-operate directly, or when appropriate through competent regional or other international organizations, in the fields of science and technology and to exchange data as well as other scientific information for the purpose of this Convention.

2. The Contracting Parties undertake as far as possible to develop and co-ordinate their national research programmes relating to all types of marine pollution in the Mediterranean Sea area and to co-operate in the establishment and implementation of regional and other international research programmes for the purposes of this Convention.

3. The Contracting Parties undertake to co-operate in the provision of technical and other possible assistance in fields relating to marine pollution, with priority to be given to the special needs of developing countries in the Mediterranean region.

Article 12

LIABILITY AND COMPENSATION

The Contracting Parties undertake to cooperate as soon as possible in the formulation and adoption of appropriate procedures for the determination of liability and compensation for damage resulting from the pollution of the marine environment deriving from violations of the provisions of this Convention and applicable Protocols.

Article 13

INSTITUTIONAL ARRANGEMENTS

The Contracting Parties designate the United Nations Environment Programme as responsible for carrying out the following secretariat functions:

i. to convene and prepare the meetings of Contracting Parties and conferences provided for in Articles 14, 15 and 16;

ii. to transmit to the Contracting Parties notifications, reports and other information received in accordance with Articles 3, 9 and 20;

iii. to consider inquiries by, and information from, the Contracting Parties, and to consult with them on questions relating to this Convention and the Protocols and Annexes thereto;

iv. to perform the functions assigned to it by the Protocols to this Convention;

v. to perform such other functions as may be assigned to it by the Contracting Parties;

vi. to ensure the necessary co-ordination with other international bodies which the Contracting Parties consider competent, and in particular, to enter into such administrative arrangements as may be required for the effective discharge of the secretariat functions.

Article 14

MEETINGS OF THE CONTRACTING PARTIES

1. The Contracting Parties shall hold ordinary meetings once every two years and extraordinary meetings at any other time deemed necessary, upon the request of the Organization or at the request of any Contracting Party, provided that such requests are supported by at least two Contracting Parties;

2. It shall be the function of the meetings of the Contracting Parties to keep under review the implementation of this Convention and the Protocols and, in particular: (i) to review gradually the inventories carried out by Contracting Parties and competent international organizations on the state of marine pollution and its effects in the Mediterranean Sea area;

a. to consider reports submitted by the Contracting Parties under Article 20;

b. to adopt, review and amend as required the Annexes to this Convention and to the Protocols in accordance with the procedure established in Article 17;

c. to make recommendations regarding the adoption of any Additional Protocols or any amendments to this Convention or the Protocols in accordance with the provisions of Articles 15 and 16;

d. to establish working groups as required to consider any matters related to this Convention and the Protocols and Annexes;

e. to consider and undertake any additional action that may be required for the achievement of the purposes of this Convention and the Protocols.

Article 15

ADOPTION OF ADDITIONAL PROTOCOLS

1. The Contracting Parties, at a diplomatic conference, may adopt Additional Protocols to his Convention pursuant to paragraph 2 of Article 4.

2. A diplomatic conference for the purpose of adopting Additional Protocols shall be convened by the Organization at the request of two thirds of the Contracting Parties.

3. Pending the entry into force of this Convention the Organization may, after consulting with the signatories to this Convention, convene a diplomatic conference for the purpose of adopting Additional Protocols.

Article 16

AMENDMENT OF THE CONVENTION OR PROTOCOLS

1. Any Contracting Party to this Convention may propose amendments to the Convention. Amendments shall be adopted by a diplomatic conference which shall be convened by the Organization at the request of two thirds of the Contracting Parties.

2. Any Contracting Party to this Convention may propose amendments to any Protocol. Such amendments shall be adopted by a diplomatic conference which shall be convened by the Organization at the request of two thirds of the Contracting Parties to the Protocol concerned.

3. Amendments to this Convention shall be adopted by a three-fourths majority vote of the Contracting Parties to the Convention which are represented at the diplomatic conference and shall be submitted by the Depositary for acceptance by all Contracting Parties to the Convention. Amendments to any Protocol shall be adopted by a three-fourths majority vote of the Contracting Parties to such Protocol which are represented at the diplomatic conference and shall be submitted by the Depositary for acceptance by all Contracting Parties to such Protocol.

a. Acceptance of amendments shall be notified to the Depositary in writing. Amendments adopted in accordance with paragraph 3 of this Article shall enter into force between Contracting Parties having accepted such amendments on the 30th day following the receipt by the Depositary of notification of their acceptance by at least three-fourths of the Contracting Parties to this Convention or to the Protocol concerned, as the case may be.

b. After the entry into force of an amendment to this Convention or to a Protocol, any new Contracting Party to this Convention or such Protocol shall become a Contracting Party to the instrument as amended.

Article 17

ANNEXES AND AMENDMENTS TO ANNEXES

i. Annexes to this Convention or to any Protocol shall form an integral part of the Convention or such Protocol, as the case may be.

ii. Except as may be otherwise provided in any Protocol, the following procedure shall apply to the adoption and entry into force of any amendments to Annexes to this Convention or to any Protocol, with the exception of amendments to the Annex on Arbitration:

i. any Contracting Party may propose amendments to the Annexes to this Convention or to any Protocols and the meetings referred to in Article 14;

ii. such amendments shall be adopted by a three-fourths majority vote of the Contracting Parties to the instrument in question;

iii. the Depositary shall without delay communicate the amendments so adopted to all Contracting Parties;

iv. any Contracting Party that is unable to approve an amendment to the Annexes to this Convention or to any Protocol shall so notify in writing the Depositary within a period determined by the Contracting Parties concerned when adopting the amendment;

v. the Depositary shall without delay notify all Contracting Parties of any notification received pursuant to the proceeding subparagraph;

vi. on expiry of the period referred to in subparagraph (iv) above, the amendment to the Annex shall become effective for all Contracting Parties to this Convention or to the Protocol concerned which have not submitted a notification in accordance with the provisions of that subparagraph.

1. The adoption and entry into force of a new Annex to this Convention or to any Protocol shall be subject to the same procedure as for the adoption and entry into force of an amendment to an Annex in accordance with the provisions of paragraph 2 of this Article, provided that, if any amendment to the Convention or the Protocol concerned is involved, the new Annex shall not enter into force until such time as the amendment to the Convention or the Protocol concerned enters into force.

2. Amendments to the Annex on Arbitration shall be considered to be amendments to this Convention and shall be proposed and adopted in accordance with the procedures set out in Article 16 above.

Article 18

RULES OF PROCEDURE AND FINANCIAL RULES

1. The Contracting Parties shall adopt rules of procedure for their meetings and conferences envisaged in Articles 14, 15 and 16 above.

2. The Contracting Parties shall adopt financial rules, prepared in consultation with the Organization, to determine, in particular, their financial participation.

Article 19

SPECIAL EXERCISE OF VOTING RIGHT

Within the areas of their competence, the European Economic Community and any regional economic grouping referred to in Article 24 of this Convention shall exercise their right to vote with a number of votes equal to the number of their Member States which are Contracting Parties to this Convention and to one or more Protocols; the European Economic Community and any grouping as referred to above shall not exercise their right to vote in cases where the Member States concerned exercise theirs, and conversely.

Article 20

REPORTS

The Contracting Parties shall transmit to the Organization reports on the measures adopted in the implementation of this Convention and of Protocols to which they are Parties, in such form and at such intervals as the meetings of Contracting Parties may determine.

Article 21

COMPLIANCE CONTROL

The Contracting Parties undertake to cooperate in the developing of procedures enabling them to control the application of this Convention and the Protocols.

Article 22

SETTLEMENT OF DISPUTES

1. In case of a dispute between Contracting Parties as to the interpretation or application of this Convention or the Protocols, they shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2. If the Parties concerned cannot settle their dispute through the means mentioned in the preceding paragraph, the dispute shall upon common agreement be submitted to arbitration under the conditions laid down in Annex A to this Convention.

3. Nevertheless, the Contracting Parties may at any time declare that they recognize as compulsory ipso facto and without special agreement, in relation to any other Party accepting the same obligation, the application of the arbitration procedure in conformity with the provisions of Annex A. Such declaration shall be notified in writing to the Depositary, who shall communicate it to the other Parties.

Article 23

RELATIONSHIP BETWEEN THE CONVENTION AND PROTOCOLS

1. No one may become a Contracting Party to this Convention unless it becomes at the same time a Contracting Party to at least one of the Protocols. No one may become a Contracting Party to a Protocol unless it is, or becomes at the same time, a Contracting Party to this Convention.

2. Any Protocol to this Convention shall be binding only on the Contracting Parties to the Protocol in question.

3. Decisions concerning any Protocol pursuant to Articles 14, 16 and 17 of this Convention shall be taken only by the Parties to the Protocol concerned.

Article 24

SIGNATURE

This Convention, the Protocol for the prevention of pollution of the Mediterranean Sea by dumping from ships and aircraft and the Protocol concerning co-operation in combating pollution of the Mediterranean Sea by oil and other harmful substances in cases of emergency shall be open for signature in Barcelona on 16 February 1976 and in Madrid from 17 February 1976 to 16 February 1977 by any State invited as a participant in the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region on the Protection of the Mediterranean Sea, held in Barcelona from 2 to 16 February 1976, and by any State entitled to sign any Protocol. They shall also be open until the same date for signature by the European Economic Community and by any similar regional economic grouping at least one member of which is a coastal State of the Mediterranean Sea area and which exercise competences in fields covered by this Convention, as well as by any Protocol affecting them.

Article 25

RATIFICATION, ACCEPTANCE OR APPROVAL

This Convention and any Protocol thereto shall be subject to ratification, acceptance, or approval. Instruments of ratification, acceptance or approval shall be deposited with the Government of Spain, which will assume the functions of Depositary.

Article 26

ACCESSION

1. As from 17 February 1977, the present Convention, the Protocol for the prevention of pollution of the Mediterranean Sea by dumping from ships and aircraft, and the Protocol concerning co-operation in combating pollution of the Mediterranean Sea by oil and other harmful substances in cases of emergency shall be open for accession by the States, by the European Economic Community and by any grouping as referred to in Article 24.
2. After the entry into force of the Convention and of any Protocol, any State not referred to in Article 24 may accede to this Convention and to any Protocol, subject to prior approval by three-fourths of the Contracting Parties to the Protocol concerned.
3. Instruments of accession shall be deposited with the Depositary.

Article 27

ENTRY INTO FORCE

1. The Convention shall enter into force on the same date as the Protocol first entering into force.
2. The Convention shall also enter into force with regard to the States, the European Economic Community and any regional economic grouping referred to in Article 24 if they have complied with the formal requirements for becoming Contracting Parties to any other Protocol not yet entered into force.
3. Any Protocol to this Convention, except as otherwise provided in such Protocol, shall enter into force on the 30th day following the date of deposit of at least six instruments of ratification, acceptance, or approval of, or accession to such Protocol by the Parties referred to in Article 24.
4. Thereafter, this Convention and any Protocol shall enter into force with respect to any State, the European Economic Community and any regional economic grouping referred to in Article 24 on the 30th day following the date of deposit of the instruments of ratification, acceptance, approval or accession.

Article 28

WITHDRAWAL

1. At any time after three years from the date of entry into force of this Convention, any Contracting Party may withdraw from this Convention by giving written notification of withdrawal.

2. Except as may be otherwise provided in any Protocol to this Convention, any Contracting Party may, at any time after three years from the date of entry into force of such Protocol, withdraw from such Protocol by giving written notification of withdrawal.

3. Withdrawal shall take effect 90 days after the date on which notification of withdrawal is received by the Depositary.

4. Any Contracting Party which withdraws from this Convention shall be considered as also having withdrawn from any Protocol to which it was a Party.

5. Any Contracting Party which, upon its withdrawal from a Protocol, is no longer a Party to any Protocol to this Convention, shall be considered as also having withdrawn from this Convention.

Article 29

RESPONSIBILITIES OF THE DEPOSITARY

1. The Depositary shall inform the Contracting Parties, any other Party referred to in Article 24, and the Organization:

i. of the signature of this Convention and of any Protocol thereto, and of the deposit of instruments of ratification, acceptance, approval or accession in accordance with Articles 24, 25 and 26;

ii. of the date on which the Convention and any Protocol will come into force in accordance with the provisions of Article 27;

iii. of notifications of withdrawal made in accordance with Article 28;

iv. of the amendments adopted with respect to the Convention and to any Protocol, their acceptance by the Contracting Parties and the date of entry into force of those amendments in accordance with the provisions of Article 16;

v. of the adoption of new Annexes and of the amendment of any Annex in accordance with Article 17;

vi. of declarations recognizing as compulsory the application of the arbitration procedure mentioned in paragraph 3 of Article 22.

2. The original of this Convention and of any Protocol thereto shall be deposited with the Depositary, the Government of Spain, which shall send certified copies thereof to the Contracting Parties, to the Organization, and to the Secretary-General of the United Nations for registration and publication in accordance with Article 102 of the United Nations Charter.

In witness whereof the undersigned, being duly authorized by their respective Governments, have signed this Convention.

Done at Barcelona on 16 February 1976 in a single copy in the Arabic, English, French and Spanish languages, the four texts being equally authoritative.

ANNEX A

ARBITRATION

Article I

Unless the Parties to the dispute otherwise agree, the arbitration procedures shall be conducted in accordance with the provisions of this Annex.

Article 2

1. At the request addressed by one Contracting Party to another Contracting Party in accordance with the provisions of paragraph 2 or paragraph 3 of Article 22 of the Convention, an arbitral tribunal shall be constituted. The request for arbitration shall state the subject matter of the application including, in particular, the articles of the Convention or the Protocols, the interpretation or application of which is in dispute.
2. The claimant party shall inform the Organization that it has requested the setting up of an arbitral tribunal, stating the name of the other Party to the dispute and articles of the Convention or the Protocols the interpretation or application of which is in its opinion in dispute. The Organization shall forward the information thus received to all Contracting Parties to the Convention.

Article 3

The arbitral tribunal shall consist of three members: each of the Parties to the dispute shall appoint an arbitrator, the two arbitrators so appointed shall designate by common agreement the third arbitrator who shall be the chairman of the tribunal. The latter shall not be a national of one of the Parties to the dispute, nor have his usual place of residence in the territory of one of these Parties, nor be employed by any of them, nor have dealt with the case in any other capacity.

Article 4

1. If the chairman of the arbitral tribunal has not been designated within two months of the appointment of the second arbitrator, the Secretary-General of the United Nations shall, at the request of the most diligent Party, designate him within a further two months' period.
2. If one of the Parties to the disputes does not appoint an arbitrator within two months of receipt of the request, the other Party may inform the Secretary-General of the United Nations who shall designate the chairman of the arbitral tribunal within a further two months' period. Upon designation, the chairman of the arbitral tribunal shall request the Party which has not appointed an arbitrator to do so within two months. After such period, he shall inform the Secretary-General of the United Nations, who shall make this appointment within a further two months period.

Article 5

1. The arbitral tribunal shall decide according to the rules of international law and, in particular, those of this Convention and the Protocols concerned.
2. Any arbitral tribunal constituted under the provisions of this Annex shall draw up its own rules of procedure.

Article 6

1. The decisions of the arbitral tribunal, both on procedure and on substance, shall be taken by majority vote of its members.

2. The tribunal may take all appropriate measures in order to establish the facts. It may, at the request of one of the Parties, recommend essential interim measures of protection.

3. If two or more arbitral tribunal constituted under the provisions of this Annex are seized of requests with identical or similar subjects, they may inform themselves of the procedures for establishing the facts and take them into account as far as possible.

4. The Parties to the dispute shall provide all facilities necessary for the effective conduct of the proceedings.

5. The absence or default of a Party to the dispute shall not constitute an impediment of the proceedings.

Article 7

1. The award of the arbitral tribunal shall be accompanied by a statement of reasons. It shall be final and binding upon the Parties to the dispute.

2. Any dispute which may arise between the Parties concerning the interpretation or execution of the award may be submitted by the most diligent Party to the arbitral tribunal which made the award or, if the latter cannot be seized thereof, to another arbitral tribunal constituted for this purpose in the same manner as the first.

Article 8

The European Economic Community and any regional economic grouping referred to in Article 24 of the Convention, like any Contracting Party to the Convention, are empowered to appear as complainants or as respondents before the arbitral tribunal.

E.2 The International Convention for the Prevention of Pollution from Ships 1973/78

The International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978, is commonly referred to as MARPOL 73/78. In addition to the obligations placed on Contracting Parties in the body of the Convention, there are five additional Annexes with their associated Regulations, two of which are compulsory (Annexes I and II) whereas the others are optional. The Annexes cover:

Annex I: Regulations for the Prevention of Pollution by Oil containing Regulations 1-26.

Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, containing 14 Regulations.

Annex III: Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (optional), containing 7 Regulations.

Annex IV: Regulations for the Prevention of Pollution by Sewage from Ships (optional), containing 11 Regulations.

Annex V: Regulations for the Prevention of Pollution by Garbage from Ships (optional), containing 7 Regulations.

Annex VI: Regulation for Prevention of Air Pollution from ships (optional). As its title implies, the aim of the MARPOL Convention is to prevent pollution from ships. It does not (in general) deal with the preparation for and response to pollution incidents from ships; these aspects are covered comprehensively by OPRC 1990.

Nevertheless, ratification of MARPOL 73/78 is an important prerequisite to oil spill contingency planning in that the overall aims of MARPOL are to achieve the complete elimination of intentional or negligent pollution of the marine environment by oil and other harmful substances and the minimisation of the accidental discharge of such substances.

Those countries which have ratified the Convention are required to implement, in respect of their flagships and all other flagships in their waters and ports, the requirements of the Convention. It should be recognised that whereas Parties to MARPOL 73/78 have obligations, they also have privileges. Parties accept the obligation not to allow their ships to discharge wastes into the sea, in return for which they have the privilege of not being polluted by the ships of other Parties. If they are, and if the pollution occurs within their territorial waters, they can prosecute the offender. Even the ships of a non-Party to MARPOL 73/78 can be prosecuted for failing to comply with the Convention if apprehended in the territorial waters of a Contracting Party.

Article 4 of MARPOL 73/78 requires Contracting Parties to prohibit violations of the Convention and to take proceedings against offenders. They are required to:

apply these to their own flagships wherever they may be;

- take proceedings against their own flagships if sufficient information and evidence of a violation is provided by another Party and inform that Party and IMO of the actions taken;
- take proceedings against other ships which commit a violation within their jurisdiction or inform the flag Administration and provide information and evidence of the violation; and
- make penalties adequate in severity to discourage violations of the Convention. The penalties shall be equally severe irrespective of where the violations occur (Article 4(4)).

In general, the MARPOL 73/78 provisions provide an important legal basis on which to prevent deliberate or negligent discharges of polluting substances from ships. However, the success or failure of the MARPOL provisions depends upon effective enforcement.

E.3 The International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990

The International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 (OPRC) provides the international legal framework for establishing national and multinational response systems to oil pollution incidents. The Convention entered into force on 13 May 1995.

The OPRC Convention was the response of the international community to the severity of oil pollution incidents in the 1980s, notably the Exxon Valdez spill. The aim of the Convention is to provide the framework for international co-operation for combating major oil pollution incidents. It recognises, *inter alia*, the importance of effective preparation for combating oil pollution incidents, including the preparation of oil pollution contingency plans.

Article 6 of the Convention places a number of specific obligations on Contracting Parties as follows:

"Each Party shall establish a national system for responding promptly and effectively to oil pollution incidents. The system shall include as a minimum:

(a) The designation of:

(i) the competent national authority or authorities with responsibility for oil pollution preparedness and response;

(ii) the national contact point or points, which shall be responsible for the receipt and transmission of oil pollution reports as referred to in article 4;

(iii) an authority which is entitled to act on behalf of the State to request assistance or to decide to render the assistance requested;

(b) A national contingency plan for preparedness and response which includes the organisational relationship of the various bodies involved, whether public or private, taking into account guidelines developed by the Organization." (The Organization referred to is the International Maritime Organization (IMO)).

In addition Article 6(2) imposes the following additional obligations:

"In addition, each Party, within its capability either individually or through bilateral or multi-lateral co-operation and, as appropriate, in cooperation with the oil and shipping industries, port authorities and other relevant entities, shall establish:

(a) a minimum level of pre-positioned oil spill combating equipment, commensurate with the risk involved, and programmed for its use;

(b) a programme of exercises for oil pollution response organisations and training of relevant personnel;

(c) detailed plans and communication capabilities for responding to an oil pollution incident. Such capabilities should be continuously available;

and

(d) a mechanism or arrangement to co-ordinate the response to an oil pollution incident with, if appropriate, the capabilities to mobilize the necessary resources."

There is a requirement that information concerning, *inter alia*, the designation of the competent authorities and contact points, the pollution response equipment and the national contingency plan should be provided to IMO (Article 6(3)).

In addition to the comprehensive obligations to establish national systems for preparedness and response, as set out in Article 6, Article 3 identifies a number of potential pollution sources all of which are required to have "local" oil pollution emergency plans which are to be co-ordinated with the national system. These are:

- ships flying the flag of the Contracting Party, which are required to have on board a shipboard oil pollution emergency plan as required by and in accordance with the provisions adopted by IMO for this purpose (this refers to regulation 26 of Annex I of MARPOL 73/78, as amended);
- operators of offshore units. This means any fixed or floating offshore installation or structure engaged in gas or oil exploration, exploitation or production activities or loading or unloading of oil;
- port authorities;
- operators in charge of oil handling facilities, which includes oil terminals and pipelines.

Furthermore, Article 4 of the Convention specifies the procedures which shall be established for reporting without delay any event involving a discharge or probable discharge of oil from ships, offshore units, seaports and oil handling facilities to "the competent national authority". These reporting obligations are to be placed on the masters of vessels or those persons in charge of the offshore units, seaports and oil handling facilities regarding discharges or probable discharges from their ***own*** activities.

In addition, the masters of vessels and persons in charge of offshore units are required to report without delay ***any*** observed event at sea involving a discharge of oil or the presence of oil. The Contracting Party's maritime inspection vessels and aircraft, or other appropriate services, are also required to report such incidents and the pilots of civil aircraft should be requested to report any such observed events.

The OPRC Convention recognises the importance of mutual assistance and international co-operation in responding to oil pollution incidents. Consequently Article 5 stipulates that whenever a Contracting Party receives an oil pollution report, it shall assess the nature, extent and possible consequences of the incident and, without delay, inform all States whose interests are affected or are likely to be affected by such an incident.

The Convention (Article 10) also encourages Contracting Parties to conclude bilateral or multi-lateral agreements for oil pollution preparedness.

In conclusion, therefore, the OPRC Convention provides a comprehensive framework to prepare for and respond to an oil pollution incident. In particular it places obligations on the Contracting Parties:

- to establish national and regional systems for preparedness and response (Article 6);
- to require potential sources of pollution to prepare site-specific and vessel specific oil pollution emergency plans (Article 3);
- to establish oil pollution reporting procedures (Article 4);
- to take appropriate action on receiving an oil pollution report.

E.4 The International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969

The International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 - commonly called the Intervention Convention - entered into force on 6 May 1975. A Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances Other than Oil was done in 1973 and entered into force on 30 March 1983.

The Convention provides important powers to a Contracting Party to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to its coastline or related interests from pollution, or the threat of pollution, of the sea by oil following a maritime casualty and which may reasonably be expected to result in major harmful consequences. The 1973 Protocol extends these powers to other harmful substances.

The term "related interests" is widely drawn and includes:

- maritime coastal, port or estuarine activities, including fisheries activities, constituting an essential means of livelihood of the persons concerned;
- tourist attractions of the area concerned;
- the health of the coastal population and the well-being of the area concerned, including conservation of living marine resources and of wildlife.

The absence of a definition as to what "measures" may be necessary gives the intervening State extensive flexibility and powers to take whatever measures it deems appropriate in the circumstances, and this could include such extreme measures as scuttling the casualty. Normally, before taking any measures, the intervening State will consult other States affected by the casualty, particularly the flag State, and also with the vessel owners where known. However, in cases of extreme urgency, the intervening coastal State may take measures immediately without prior notification or consultation. The IMO maintains a list of experts who can assist coastal States in assessing the need for intervention and in the determination of the appropriate courses of action.

An important restraint is that the measures taken by the coastal State shall be proportionate to the actual or threatened damage. Such measures shall not go beyond what is reasonably necessary to achieve the end of preventing, mitigating or eliminating the danger of pollution or the threat of pollution by oil. The measures shall cease as soon as that end has been achieved.

Provided the measures taken by the intervening State are within the scope of the Convention, no compensation shall be payable by the State concerned. However, compensation may be paid to the extent that the intervening State takes measures which exceed those reasonably necessary to achieve the end and which cause damage to others, notably the owner of the casualty. The Convention does provide for a conciliation and arbitration procedure to be followed in the event of a dispute as to whether the measures taken by the intervening State were in contravention of the Convention.

The Convention provides that no measures may be taken against warships or other ships owned and operated by a State and used only on government non-commercial service.

The Intervention Convention and its related Protocol were prepared in recognition of the need to protect the interests of coastal States against the grave consequences of a maritime casualty resulting in danger of oil pollution of the sea and shorelines. It was recognised that, under such circumstances, measures of an exceptional character to protect such interests might be necessary on the high seas and that these measures do not affect the principle of freedom of the high seas.

Intervention in national waters

Many administrations have enacted legislation giving the relevant Government authority the right to intervene in the event of a marine casualty occurring in national waters. In such cases the authority must have assessed the situation and concluded that the nature or degree of actions taken by the ship-owner or his agents is not satisfactory. The authority can then either issue instructions or advice to the ship-owner and his agents as to how they should proceed, or it can take direct operational control.

In all cases the master of the casualty vessel should take immediate action to ensure the safety of the crew and the preservation of the ship and cargo and will make arrangements, if necessary, for salvage. Arrangements for salvage are normally made with a professional salvage company. It should be recognised that the salvor's aim is to salvage the casualty successfully, whereas the administration must give priority to protection of the coastal environment and commercial resources.

E.5 Civil Liability Convention 1969

The International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC) lays down the principle of strict liability for ship-owners and provides for a system of compulsory insurance.

General Principles

Scope of application

The CLC applies to oil pollution damage resulting from spills from tankers and suffered in the territory (including the territorial sea and exclusive economic zone (EEZ)) of a Contracting State. The only criterion for its applicability is where the damage occurred. The Flag State of the tanker and the nationality of the ship-owner are irrelevant for determining the scope of application of the CLC.

The CLC also applies to measures (“preventive measures”), wherever they are taken, to prevent or minimise pollution damage in the territory, including the territorial sea, of a Contracting State.

Only damage caused by persistent oil such as crude oil, fuel oil, heavy diesel oil, lubricating oil and whale oil is covered by the Convention. Spills of non-persistent oil, such as gasoline, light diesel oil, kerosene, etc., do not fall within the scope of the CLC.

Spills of bunker oil from ships other than tankers are not covered by the CLC.

The CLC (and also the Fund Convention) only deal with oil pollution from ships.

Pollution resulting from offshore operations fall outside the scope of both Conventions and compensation for such pollution damage would have to be governed by national law.

Similarly, compensation for oil pollution damage not covered by the CLC (i.e. damage caused by ships other than tankers and damage caused by non-persistent oil) would have to be governed by national law.

Strict liability

The principle on which compensation is paid under the CLC (and also the Fund Convention) is based on "strict liability"; i.e. those parties who have suffered pollution damage from an incident do not have to prove that the ship-owner/master/crew of the tanker was at fault in order to obtain compensation promptly. The ship-owner may be exempted from liability only in a few particular cases (Article III):

- the damage resulted from an act of war or a grave natural disaster;
- the damage was wholly caused by sabotage by a third party; or
- the damage was wholly caused by the failure of authorities to maintain navigational aids.

The grounds for exemption are very limited and the shipowner will, therefore, be liable for pollution damage in almost all incidents which occur under normal circumstances.

Limitation of liability and compulsory insurance

The ship-owner is, under certain conditions, entitled to limit his liability to an amount of 133 SDR (US$ 200) per ton of the ship's tonnage or 14,000,000 SDR (US$ 21 million), whichever is the less (SDR: Special Drawing Rights). In order to be entitled to limit his liability, the ship-owner must establish a limitation fund by depositing the limitation amount with a court or by providing a guarantee for that amount acceptable to the court. However, if a claimant proves that the incident occurred as the result of the personal fault of the shipowner, the owner will be deprived of the right to limit his liability.

Claims for pollution damage under the CLC can be made only against the registered owner of the tanker concerned. This does not preclude victims from claiming compensation outside the CLC from persons other than the owner. No claim can, however, be made against the servants or agents of the owner.

The owner of a tanker carrying more than 2,000 tonnes of persistent oil as cargo is obliged to maintain insurance to cover his liability under the CLC. When entering or leaving a port or a terminal installation of a State party to the CLC, a certificate of insurance is required and is required also for ships flying the flag of a State which is not party to the CLC.

Revision of the Civil Liability Convention and the Fund Convention

In 1984 a Diplomatic Conference held in London under the auspices of IMO adopted two Protocols to amend the CLC and the Fund Convention respectively. These Protocols provide higher limits of compensation and a wider scope of application than the Conventions in their original versions. By 1990, however, it had become clear that the 1984 Protocols would not enter into force since the required number of ratifications would not be obtained.

Consequently, another Diplomatic Conference, held in London in 1992, adopted two new Protocols amending the Conventions in order to ensure the viability in the future of the system of compensation established by these Conventions. The Diplomatic Conference based its activities on two draft Protocols elaborated within the IOPC Fund (International Oil Pollution Compensation Fund). The new Protocols retained the substantive provisions of the 1984 Protocols, but with lower entry into force provisions.

The entry into force requirements were fulfilled on 30 May 1995 and the 1992 Protocols therefore came into force with effect from 30 May 1996.

Higher limits for ship-owners' liability

Under the 1992 Protocol to the CLC the limits of the ship-owners' liability are changed by the introduction of the special liability limit for small vessels and by a substantial increase of the limitation amounts. The new limitation figures are:

- for a ship not exceeding 5,000 gross tonnage, 3 million SDR (US$ 4.7 million);

- for a ship with a tonnage between 5,000 and 140,000 gross tonnage, 3 million SDR (US$ 4.7 million) plus 420 SDR (US$ 655) for each additional unit of tonnage;
- for a ship exceeding 140,000 gross tonnage, 59.7 million SDR (US$ 93 million).

Other amendments effected by the 1992 Protocols

The 1992 Conference did not adopt new measures from those adopted in 1984; it simply made the entry into force conditions more achievable. In addition to the higher limits for ship-owners' liability and higher compensation limits described above, the main amendments adopted by the 1992 Conference were the following:

- A simplified procedure for increasing the limitation amounts to the two Conventions.
- The geographical scope of application of both Conventions was extended to the exclusive economic zone (EEZ) established under the UN Convention on the Law of the Sea.
- Pollution damage caused by a spill of persistent oil from an unladen tanker will be compensated under the 1992 CLC and the Fund Convention.
- Reasonable expenses incurred for preventive measures are recoverable under the 1992 Conventions even when there is no spill of oil as a result of the incident, provided that there was a grave and imminent danger of pollution damage.

The 1992 Protocol to the CLC contains a new definition of the notion of "pollution damage". This retains the basic wording of the original definition but a phrase has been added to clarify that only the costs of reasonable measures to reinstate the contaminated environment are included in the concept of pollution damage.

Definition of "Pollution Damage" in the Civil Liability Convention and the Fund Convention

The 1992 Protocol to the CLC contains an amended wording of the definition of "pollution damage". A proviso was added to the effect that compensation for impairment of the environment (other than loss of profit from such impairment) should be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken. The definition in the 1992 Protocol reads as follows:

"Pollution damage" means:

(a) loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship, wherever such escape or discharge may occur, provided that compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken;

(b) the costs of preventive measures and further loss or damage caused by preventive measures."

An Intercessional Working Group was established in 1994 to examine the criteria for the admissibility of claims for compensation and the procedures to be applied by the IOPC Fund. With regard to environmental damage claims, the Working Group agreed that, in order to be

admissible for compensation, measures for reinstatement of the marine environment would have to fulfill the following criteria:

- the cost of the measures should be reasonable;
- the cost of the measures should not be disproportionate to the results achieved or the results which could reasonably be expected; and
- the measures should be appropriate and offer a reasonable prospect of success.

The Working Group considered that it would normally be necessary to carry out an in depth study before any measures for reinstatement were undertaken. It also took the view that the admissibility of claims relating to costs for reinstatement of the environment would have to be kept under review by the IOPC Fund.

Many States have introduced a system of criminal or civil penalties for oil pollution from ships (including Egypt under Law No. 4 of 1994), as is their sovereign right. However, criminal and civil penalties for oil pollution from ships do not constitute compensation and do not therefore fall within the scope of the CLC and the Fund Convention. Damages of a punitive character, calculated on the basis of the degree of fault of the wrong-doer and/or the profit earned by the wrong-doer, are not admissible claims under the Conventions.

In summary, projects to reinstate the environment after an oil spill are eligible for reimbursement under the Conventions provided that the IOPC Fund agrees that they are reasonable. In practice, the IOPC Fund secretariat often relies on the staff of the International Tanker Owners Pollution Federation (ITOPF) to help them in determining reasonableness. There is a longstanding IOPC Fund policy that monetary damages calculated by theoretical formulae are not eligible for compensation.

E.6 The International Oil Pollution Compensation Fund

The Fund Convention was elaborated as a supplementary convention to the CLC. The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (the Fund Convention) set up an international organisation - the International Oil Pollution Compensation Fund (the IOPC Fund) - to administer the system of compensation created by that Convention. Only those States which have become Parties to the CLC can become Members of the IOPC Fund.

The main functions of the Fund Convention are to provide supplementary compensation to those who cannot obtain full and adequate compensation for oil pollution damage under the CLC, and to indemnify the ship-owner for a portion of his liability under the CLC.

The IOPC Fund is financed by contributions from persons who receive crude oil and heavy fuel oil in Fund Member States.

Supplementary compensation

The IOPC Fund pays compensation to any person suffering oil pollution damage in IOPC Fund Member States if that person is unable to obtain full and adequate compensation under the CLC for one of the following reasons:

- No liability for pollution damage arises under the CLC because the owner can invoke one of the exemptions under that Convention.
- The owner is financially incapable of meeting his obligations under the CLC and his insurance is insufficient to satisfy the claims for compensation for pollution damage.
- The damage exceeds the owner's liability under the CLC.

Experience has shown that in most cases, the IOPC Fund becomes involved for the third reason, i.e. the damage exceeds the ship-owner's limit under the CLC.

Of over 70 incidents dealt with by the IOPC Fund, only a few have given rise to claims in excess of the limit of compensation that applied to the incident (e.g. the Tanio incident in France in 1980, the Haven incident in Italy in 1991 and the Braer in 1993).

Contributions to the IOPC Fund

The payments of compensation and indemnification, as well as the administrative expenses of the IOPC Fund, are financed by contributions levied on any person who has received crude oil and heavy fuel oil ("contributing oil") in a quantity exceeding 150,000 tonnes in one calendar year in a Contracting State to the Fund Convention.

Contributing oil is counted for contribution purposes each time it is received at ports or terminal installations in a Fund Member State after carriage by sea. The term "received" refers to receipt into tankage or storage immediately after carriage by sea. The place of loading is irrelevant in this context; the oil may be imported from abroad, carried from another port in the same State, or transported by ship from an offshore production rig. Also oil received for trans-shipment to another port or received for further transport by pipeline is considered as received for contribution purposes.

There are both initial and annual contributions to the IOPC Fund. Initial contributions are payable when a State becomes a Member of the IOPC Fund. Annual contributions are levied to meet the anticipated payments of compensation by the IOPC Fund during the coming year (including administrative expenses). The amount of annual contributions is decided each year by the IOPC Fund Assembly. Every contributor pays a specified amount per tonne of contributing oil received.

Each Member State is required to report every year to the IOPC Fund the name and address of any person (normally an oil company) in that State who is liable to contribute to the IOPC Fund, as well as the quantity of contributing oil received by any such person.

After the Assembly's decisions on the levy of annual contributions, the IOPC Fund issues an invoice to each contributor, normally due on 1 February of the following year. The contributions

are payable by the individual contributors directly to the IOPC Fund; a State is not responsible for the contributions levied from contributors in that State unless it has voluntarily assumed such responsibility.

The level of contributions varies from one year to another since the payments of compensation will vary. In the past, contributions have varied from 0 to £28,701 for each 1 million tonnes of received contributing oil.

When the Fund Convention was adopted in 1971, the concept of an international fund was something new. There was no experience of the functioning of a system of this kind. Fears were expressed that the Fund Secretariat would have difficulties in collecting the money required for compensating victims. These fears have proved to be unjustified.

Contributions are generally paid on time and there is only a negligible amount in arrears.

Higher limit of 1992 Fund's compensation

The limit of compensation payable by the IOPC Fund under the 1992 Fund Convention is increased to 135 million SDR (US$ 210 million), including the compensation payable by the ship-owner under the 1992 CLC Protocol.

The limit of compensation would be increased to 200 million SDR (US$ 312 million) if there were three Member States of the 1992 Fund whose combined quantity of contributing oil received during a given year in their respective territories exceeded 600 million tonnes.

This situation is unlikely to happen, however, as it would require the USA to become a member and this, in turn, is unlikely.

Claims against the IOPC Fund

The Fund can pay compensation to a claimant only to the extent that his claim is justified and meets the criteria laid down in the Fund Convention. To this end, a claimant is required to prove his claim by producing explanatory notes, invoices, receipts and other documents to support the claim. The IOPC Fund has issued a "Claims Manual" which gives basic information on how to present a claim against the IOPC Fund.

Usually payment will be made without recourse to the courts provided that the claims and documentary supporting evidence are clearly made. Compensation can only be paid to the extent that the claim is justified and meets certain criteria. Claims are acceptable for:

- clean-up operations at sea or on the beach, e.g. deployment of vessels, use of booms and dispersants and absorbents;
- reasonable preventive measures, e.g. placing booms along a threatened coast, use of dispersants at sea;
- damage to property for clean-up of such things as dirtied boats, fishing gear, piers, or their replacement if cleanup is impossible;

- economic loss for those who depend directly on earnings from coastal or sea-related activities, e.g. loss of earnings of fishermen, hoteliers, contamination of shellfish beds, etc;
- reasonable costs of measures taken to reinstate the environment.

E.7 P&I Clubs

Under the Civil Liability Convention, the owner of a tanker carrying more than 2,000 tonnes of persistent oil as cargo is obliged to maintain insurance to cover his liability under the CLC. When entering or leaving a port or terminal installation of a State Party to the CLC, a certificate of insurance is required. This certificate is required also for ships flying the flag of a State which is not Party to the CLC. This is because the Convention covers pollution damage suffered in the territory (including the territorial sea and EEZ) of a State party to the Convention. The Flag State of the tanker and the nationality of the ship-owner are irrelevant for determining the scope of application of the CLC.

In practically every case, the ship-owner takes his pollution liability insurance through a Protection and Indemnity Association, commonly called a P&I Club. Investigations, evaluations and settlement of claims for pollution damage are carried out by the ship-owner's P&I Club.

In the event of a major incident, the investigation and evaluation of damage is carried out jointly by the IOPC Fund and the P&I Club. Surveyors are normally employed jointly by the P&I Club and the IOPC Fund for the survey of the incident and the cleanup operations. In most cases, the staff of the International Tanker Owners Pollution Federation Limited (ITOPF) is used for surveying purposes.

The surveyors appointed by the IOPC Fund and the P&I Club attend the spill as early as possible. They monitor the cleanup operation and report to the Director of the Fund and to the P&I Club on the manner in which the operations are carried out. They also advise authorities dealing with the spill response on the best methods of preventive measures or cleanup operations, to the extent that such advice is requested or appreciated by the authorities responsible for responding to the incident. The surveyors discuss with the authorities the procedures that have to be observed in order to facilitate the presentation of claims against the P&I Club and the IOPC Fund quickly and in a meaningful manner (e.g. accounting of expenses in a systematic way). Finally, the surveyors advise the authorities whether certain measures taken - or to be taken - may later be regarded by the IOPC Fund as not being "reasonable". This gives the opportunity of discussing the merits of certain measures before they are actually taken. In this way, disputes on the question of recovery of expenses incurred can often be avoided.

In the case of a major spill, the first part of any claim for compensation for pollution damage is settled by the P&I Club; the IOPC Fund makes up the balance subject to the ceiling on the limit of compensation. In practice, the victims of pollution damage seldom notice the difference because the negotiation and settlement of claims are carried out in very close co-operation between the P&I Club and the IOPC Fund.

APPENDIX F: GUIDELINES FOR MAKING CLAIMS FOR COMPENSATION

F.1 PRESENTING A CLAIM

Lebanon is a Contracting Party to the 1969 International Convention on Civil Liability for Oil Pollution Damage (CLC).

The role of the Civil Liability Convention

Under the 1969 Civil Liability Convention, claims for compensation for oil pollution damage may be brought against the owner of the ship which caused the damage (or his insurer).

Under the 1969 Civil Liability Convention, the ship-owner has “strict liability” for pollution damage caused by the escape or discharge of persistent oil from his ship. This means that he is liable even in the absence of fault on his part.

The ship-owner is obliged to maintain insurance to cover his liability under the 1969 Civil Liability Convention. This obligation does not apply to ships carrying less than 2 000 tonnes of oil as cargo.

The problem of confronting pollution from unknown sources is perhaps the most important from the point of view of marine oil spills because it is a persistent problem. It is evident that much marine oil pollution in Egyptian waters emanates from “unknown sources”. It is probable that the majority is discharged illegally by passing ships. In the past, there has been no mechanism - and in particular no financial mechanism - to reimburse the costs of any agency responding to sightings of oil spills from unknown sources. This deficiency was clearly recognised by EEAA in

The drafting of Law No. 4 and its Executive Regulations. It is clear that the legislation specifically envisages the Environmental Protection Fund’s resources being used for confronting oil spills from unknown sources.

In the event of an oil spill in Egypt, it is likely that the EPF will be used in the first instance to reimburse costs for clean-up action. Where the polluter is identified, the costs will then be reclaimed from the ship owner’s or the oil company’s insurance.

It should be recognised that responding to oil spills from unknown sources is likely to be a drain on the Environmental Protection Fund with little chance of recompense, at least until surveillance and enforcement procedures are improved. However, it should also be remembered that “confronting pollution from unknown sources” is one of the clearly stated purposes of the Fund.

In addition to the persistent problem of responding to oil spills from unknown sources, the second area in which EEAA will be called upon to take action is in the case of a major oil spill which is beyond the resources of local facilities to deal with (ie a Tier Two or Tier Three spill). It is probable that the sources of major oil spills will be clearly identifiable. In most cases they will involve an accident with a laden oil tanker, although a major disaster at an offshore petroleum installation could also be envisaged.

In order to respond to major oil spills it is likely that EEAA, as the coordinating agency, will have to call on the resources of major stockpiles of equipment from the private sector, or the resources of neighbouring States with which Egypt has cooperation agreements. In both cases the providers of equipment will reasonably expect to be reimbursed for their services. It is therefore essential, in order to ensure a swift and effective response, that a designated official in EEAA has prior written authority to call upon such equipment and commit Egypt to the reimbursement of the response costs out of the Environmental Protection Fund.

In the case of major oil spills the Government of Egypt will be able to reclaim all the costs of combating the spill and any economic damage caused by initiating claims against the polluter. The costs will probably be reimbursed out of the vessel's or the petroleum sector's insurance.

Law No. 4 imposes strict financial penalties on any merchant shipping which is shown to be in breach of the Law and its Executive Regulations. The fines vary according to the nature of the offence but range between 150,000 and 500,000 L.E. for discharges of oil or oily mixtures into the sea. Article 7 of the Executive Regulations makes it clear that "fines and compensations by court rulings or which are agreed upon for damages affecting the environment" will be paid into the Environmental Protection Fund.

Who is entitled to compensation?

Anyone who has suffered pollution damage in a State which is a Contracting Party to the CLC may make a claim for compensation. Claimants may be private individuals, partnerships, companies, private organisations or public bodies, including States or local authorities. If several claimants suffer similar damage, they may find it more convenient to submit co-ordinated claims. This can facilitate claims handling.

Compensation is also payable for the cost of reasonable measures to prevent or minimise pollution damage wherever these measures are taken, even on the high seas.

For example, if a response on the high seas to an oil spill succeeds in preventing or reducing pollution damage within the territorial sea or exclusive economic zone of Lebanon, the response would in principle qualify for compensation under the CLC.

To whom should a claim be addressed?

Claims for compensation under the Civil Liability Convention should be brought against the ship-owner liable for the damage, or directly against his insurer. The insurer will normally be one of the Protection and Indemnity Associations (P & I Clubs) which insure the third-party liabilities of ship-owners.

The P & I Club concerned will usually investigate the incident and assess the damage. Full supporting documentation should be submitted either to the ship-owner or his P & I Club.

In some cases, claims are channelled through the office of a designated local surveyor. Claimants should in such cases submit their claims to that office, for forwarding to the P & I Club for decision. Details of claims offices are given in the local press. All claims are referred to the P & I

Club for a decision on their admissibility. Neither a designated local surveyors nor a local claims office may decide on the admissibility of claims.

Within what period should a claim be made?

Claimants should submit their claims as soon as possible after the damage has occurred. If a formal claim cannot be made shortly after an incident, MOEW and insurers would appreciate being notified as soon as possible of a claimant's intention to present a claim at a later stage.

Claimants will ultimately lose their right to compensation under the 1969 Civil Liability Convention unless they bring court action within three years of the date on which the *damage occurred*, or make formal notification of a court action against the ship-owner or his insurer within that three-year period. Although damage may occur some time after an incident takes place, court action must in any case be brought within six years of the *date of the incident*. Claimants are recommended to seek legal advice on the formal requirements of court actions, to avoid their claims becoming time-barred.

Insurers endeavour to settle claims out of court. However, claimants are advised to present any claims well in advance of the expiry dates of the periods mentioned above. This allows time for claims to be examined and settled out of court, but also ensures that claimants will be able to sue the insurers for compensation and prevent their claims from being time-barred if they are unable to agree on amicable settlements of the claims.

How should a claim be presented?

Claims should be made in writing (including telefax and email). A claim should be presented clearly and with sufficient detail to assess the amount of the damage or the claim for reimbursement of costs on the basis of the facts and the supporting documentation presented. Each item of a claim must be substantiated by an invoice or other relevant supporting documentation, such as work sheets, explanatory notes, accounts and photographs. It is the responsibility of claimants to submit evidence supporting their claims.

The insurers usually appoint surveyors and technical advisers to investigate the technical merit of claims. Claims can be settled promptly only if claimants co-operate fully with these surveyors and advisers and provide all information relevant to the assessment of the claims.

The speed with which claims are settled depends largely on how long it takes for claimants to provide the insurers with the required information. Claimants are therefore advised to follow these Guidelines as closely as possible. If the documentation in support of a claim is likely to be considerable, claimants should contact the P & I Club concerned (or where appropriate the designated surveyor or local claims office) as soon as possible after the incident to discuss claim presentation.

The working language of the insurance companies is English. Claim settlement will proceed more quickly if claims, or at least claim summaries, are submitted in English.

What information should a claim contain?

Each claim should contain the following basic information:

- the name and address of the claimant, and of any representative
- the identity of the ship involved in the incident
- the date, place and specific details of the incident, if known to the claimant
- the type of pollution damage sustained
- the amount of compensation claimed.

Additional information may be required for specific types of claim. This is described in more detail below.

F.2 Admissible Claims

Claims policy

Insurers will accept only those claims which fall within the definitions of *pollution damage* and *preventive measures* laid down in the Civil Liability Convention. A uniform interpretation of the definitions is essential for the functioning of the system of compensation established by the Conventions, including the International Oil Pollution Compensation Fund. The policy on the admissibility of claims for compensation under the Fund Convention has been established by the Governments of Member States and this policy tends to be followed by insurers working under the terms of the CLC.

However, each claim has its own particular characteristics, and it is therefore necessary to consider each claim on the basis of its own merits, in the light of the particular circumstances of the case. The adopted criteria therefore allow for a certain degree of flexibility.

General criteria

The following general criteria apply to all claims:

- any expense/loss must actually have been incurred
- any expense must relate to measures which are deemed reasonable and justifiable
- a claimant's expense/loss or damage is admissible only if and to the extent that it can be considered as caused by contamination
- there must be a link of causation between the expense/loss or damage covered by the claim and the contamination caused by the spill
- a claimant is entitled to compensation only if he has suffered a quantifiable economic loss
- a claimant has to prove the amount of his loss or damage by producing appropriate documents or other evidence.

A claim is thus admissible only to the extent that the amount of the loss or damage is actually demonstrated. A certain flexibility is nevertheless exercised in respect of the requirement to present documents, taking into account the particular circumstances of the claimant or industry concerned or of the country in question. All elements of proof are considered, but the evidence provided must give the insurers the possibility of forming their own opinion on the amount of the loss or damage actually suffered.

F.3 Clean-up operations and property damage

Clean-up operations on shore and at sea, and property damage

Clean-up operations on shore and at sea would in most cases be considered as *preventive measures*, i.e. measures to prevent or minimise *pollution damage* as defined in the Civil Liability Convention.

Insurers will compensate the cost of reasonable measures taken to combat the oil at sea, to defend sensitive resources and to clean shorelines and coastal installations.

Loss or damage caused by measures to prevent or minimise pollution is also compensated. For example, if clean-up measures result in damage to roads, piers and embankments, the cost of the resulting necessary repairs is admissible. However, claims for work which involves improvements rather than the repair of damage resulting from a spill will not be accepted.

Claims for measures to prevent or minimise pollution damage are assessed on the basis of objective criteria. The fact that a government or other public body decides to take certain measures does not in itself mean that the measures are reasonable for the purpose of the Conventions. The technical reasonableness is assessed on the basis of the facts available at the time of the decision to take the measures. However, those in charge of the operations should continually reappraise their decisions in the light of developments and further technical advice.

Claims for costs are not accepted when it could have been foreseen that the measures taken would be ineffective. On the other hand, the fact that the measures prove to be ineffective is not in itself a reason for rejection of a claim for the costs incurred. The costs incurred, and the relationship between these costs and the benefits derived or expected, should be reasonable. In the assessment, the insurers take account of the particular circumstances of the incident.

Claims for clean-up operations may include the cost of personnel and the hire or purchase of equipment and materials. The reasonable costs of cleaning and repairing clean-up equipment and of replacing materials consumed during the operations are accepted. If the equipment used was purchased for a particular spill, deductions are made for the residual value when the amount of compensation is assessed. If a public authority has purchased and maintained materials or equipment so that they are immediately available if an incident occurs, compensation is paid for a reasonable part of the purchase price of the materials and equipment actually used.

Salvage and preventive measures

Salvage operations may in some cases include an element of preventive measures. Such operations can be considered as *preventive measures* only if the primary purpose is to prevent *pollution damage*. If the operations have another purpose, such as salving hull and cargo, the costs incurred are not admissible under the Conventions. If the activities are undertaken for the purpose of both preventing pollution and salving the ship and cargo, but it is not possible to

establish with any certainty the primary purpose of the operations, the costs are apportioned between pollution prevention and other activities. The assessment of compensation for activities which are considered to be *preventive measures* is not made on the basis of the criteria applied for assessing salvage awards; the compensation is limited to costs, including a reasonable element of profit.

Disposal of collected material

Clean-up operations frequently result in considerable quantities of oil and oily debris being collected. Reasonable costs for disposing of the collected material are admissible. If a claimant has received any extra income following the sale of recovered oil, these proceeds would be deducted from any compensation to be paid.

Property damage

Claims for the cost of cleaning or repairing property which has been contaminated by oil (for example boats, yachts and fishing gear) are accepted. If it is not possible for the property to be cleaned or repaired, then replacement costs are accepted, though with a reduction for wear and tear.

Cost of studies

Expenses for studies are compensated only if the studies are carried out as a direct consequence of a particular oil spill, and as a part of the oil spill response or to quantify the level of loss or damage. Insurers will not pay for studies of a general or purely scientific character.

Post-spill environmental studies are sometimes carried out to establish the precise nature and extent of the pollution damage caused by an oil spill and/or the need for reinstatement measures. Insurers may contribute to the cost of such studies, provided that the studies concern damage which falls within the definition of *pollution damage* laid down in the Conventions as interpreted by the IOPC Funds, including reasonable measures to reinstate the environment. In such cases, the P & I Club should be given the possibility of becoming involved at an early stage in the selection of the experts who will carry out the studies, and in the determination of the mandate of these experts. The studies should be practical and likely to deliver the required data. Their scale should not be out of proportion to the extent of the contamination and the predictable effects. The extent of the studies and associated costs should also be reasonable from an objective point of view and the costs incurred should be reasonable.

Fixed costs

Clean-up operations are often carried out by public authorities which use permanently employed personnel, or vessels, vehicles and equipment owned by those authorities. The authorities may then incur additional *costs*, i.e. expenses which arise solely as a result of the incident and which would not have been incurred had the incident and related operations not taken place. Reasonable *additional costs* are acceptable.

Authorities may claim compensation for so-called *fixed costs*, i.e. costs which would have arisen for the authorities concerned even if the incident had not occurred, such as normal salaries for permanently employed personnel and capital costs of vessels owned by the authorities. Insurers accept a reasonable proportion of *fixed costs*, provided that these costs correspond closely to the clean-up period in question and do not include remote overhead charges.

Claim presentation

It is essential that supporting documentation shows how the expenses for clean-up operations are linked with the actions taken at specified work sites.

Major expenditures may be incurred for the use of aircraft, vessels, specialised equipment, heavy machines, trucks and personnel. Some of these may be government-owned; others may be the subject of contractual arrangements. Claimants should keep comprehensive records of all operations and expenditures resulting from an incident. Supervisory personnel should daily record the operations in progress, the equipment in use, where and how it is being used, the number of personnel employed, how and where they are deployed and the materials consumed. Standard work sheets, designed to suit the particular circumstances of the spill and the response organization in the country concerned, are useful for such records. It is useful to appoint a financial controller to keep adequate records and control expenditure.

Claims for *clean-up operations* and *preventive measures* should be itemised as follows:

- Delineation of the area affected, describing the extent of the pollution and identifying those areas most heavily contaminated (for example using maps or nautical charts, supported by photographs or video tapes)
- Analytical and/or other evidence linking the oil pollution with the ship involved in the incident (such as chemical analysis of oil samples, relevant wind, tide and current data, observation and plotting of floating oil movements)
- Summary of events, including a description and justification of the work carried out at sea, in coastal waters and on shore, together with an explanation of why the various working methods were selected
- Dates on which work was carried out at each site
- Labour costs at each site (number and categories of response personnel, regular or overtime rates of pay, hours or days worked, other costs)
- Travel, accommodation and living costs for response personnel
- Equipment costs at each site (types of equipment used, rate of hire or cost of purchase, quantity used, period of use)
- Consumable materials (description, quantity, unit cost and where used)
- Any remaining value at the end of the operations of equipment and materials purchased
- Age of equipment not purchased but used in the incident
- Transport costs (number and types of vehicles, vessels or aircraft used, number of hours or days operated, rate of hire or operating cost)
- Cost of temporary storage (if applicable) and of final disposal of recovered oil and oily material.

Claims for damage *to property* should be itemised as follows:

- Extent of pollution damage to property and an explanation of how the damage occurred

- Description and photographs of items destroyed, damaged or needing replacement, repair or cleaning (for example boats, fishing gear, roads, clothing), including their location
- Cost of repair work, cleaning or replacement of items
- Age of items to be replaced
- Cost of restoration after clean-up, such as repair of roads, piers and embankments damaged by the clean-up operations, with information on normal repair schedules.

F.4 Consequential loss

Insurers accept in principle claims for loss of earnings suffered by the owners or users of property contaminated as a result of a spill (*consequential loss*). One example of consequential loss is a fisherman's loss of income as a result of his nets becoming polluted. He would be compensated for his loss of income as well as receiving compensation for the damage to his property.

Pure economic loss

An important group of claims are those relating to *pure economic loss*, i.e. loss of earnings sustained by persons whose property has not been polluted. A fisherman whose boat and nets have not been contaminated may be prevented from fishing because the area of the sea where he normally fishes is polluted and he cannot fish elsewhere. Similarly, a hotelier or restaurateur whose premises are close to a contaminated public beach may suffer loss of profit because the number of guests falls during the period of pollution.

Claims for pure economic loss are admissible only if they are for loss or damage caused by contamination. The starting point is the pollution, not the incident itself.

To qualify for compensation for pure economic loss, there must be a reasonable degree of proximity between the contamination and the loss or damage sustained by the claimant. A claim is not admissible for the *sole* reason that the loss or damage would not have occurred had the oil spill not happened. When considering whether the criterion of reasonable proximity is fulfilled, the following elements are taken into account:

- the geographic proximity between the claimant's activity and the contamination
- the degree to which a claimant was economically dependent on an affected resource
- the extent to which a claimant had alternative sources of supply or business opportunities
- the extent to which a claimant's business formed an integral part of the economic activity within the area affected by the spill.

Insurers also take into account the extent to which a claimant was able to mitigate his loss.

The assessment of a claim for pure economic loss is based on the actual financial results of the individual claimant for appropriate periods during the years before the incident. The assessment is not based on budgeted figures. Insurers take into account the particular circumstances of the claimant and consider any evidence presented. The criterion is whether the claimant's business as a whole has suffered economic loss as a result of the contamination.

Any saved overheads or other normal expenses not incurred as a result of the incident should be subtracted from the loss suffered by the claimant, for both consequential loss and pure economic loss.

Measures to prevent pure economic loss

Claims for the cost of measures to prevent pure economic loss may be admissible if they fulfill the following requirements:

- the cost of the proposed measures is reasonable
- the cost of the measures is not disproportionate to the further damage or loss which they are intended to mitigate
- the measures are appropriate and offer a reasonable prospect of being successful
- in the case of a marketing campaign, the measures relate to actual targeted markets.

To be admissible, the costs should relate to measures to prevent or minimise losses which, if sustained, would qualify for compensation under the Conventions. Claims for the cost of marketing campaigns or similar activities are accepted only if the activities undertaken are in addition to measures normally carried out for this purpose. In other words, compensation is granted only for the additional costs resulting from the need to counteract the negative effects of the pollution.

The criterion of *reasonableness* is assessed in the light of the particular circumstances of the case, taking into account the interests involved. The assessment is made on the basis of the facts known at the time that the measures are taken. As for marketing campaigns, measures of too general a nature are not accepted.

Insurers do not normally accept claims for measures to prevent pure economic loss until they have been carried out. Insurers are also cautious about advance payments for such measures since they will not take on the role of a claimant's banker.

When considering the admissibility of claims for the cost of an organisation's marketing activities, insurers take into account the organisation's attitude towards the media after the incident and, in particular, whether that attitude increased the negative effects of the pollution.

Contamination of fisheries and aquaculture produce

If there are mortalities in fish and aquaculture stocks following an incident, the claimant should document the loss by preserving samples and using photographic and other forms of recording to demonstrate the nature and extent of the loss.

Insurers and the IOPC Fund have in the past received claims for compensation based on the destruction of farmed fish and shellfish as a result of orders issued by public authorities in the form of fishing bans or exclusion zones. The IOPC Funds and insurers do not consider a fishing ban or exclusion zone imposed by a public authority as conclusive justification for destroying produce affected by a ban. Such claims are admissible if and to the extent that the destruction of the produce was reasonable on the basis of the scientific and other evidence available.

When assessing whether the destruction of produce was reasonable, the following points will be considered:

- whether the produce was contaminated
- the likelihood that the contamination would disappear before the normal harvesting time
- whether the retention of the produce in the water would prevent further production
- the likelihood that the produce would be marketable at the time of normal harvesting.

Since the assessment of whether the destruction was reasonable is based on scientific and other evidence, it is important that sampling and testing are carried out, in particular testing for taint. Samples from an area affected by the spill (*suspect* samples) and *control* samples from a nearby commercial outlet outside the polluted area should be tested at the same time. The two groups of samples should be of equal numbers. Taste testers should not be able to identify whether the sample being tasted is a suspect or a control sample (i.e. it must be a *blind* testing).

Claim presentation for consequential loss and pure economic loss

Claimants should substantiate their loss with appropriate documents or other evidence.

Claims for *consequential loss* and *pure economic loss* should include the following information:

- Nature of loss, including proof that the alleged loss resulted from the contamination
- Comparative figures for earnings in previous periods and during the period when economic loss was suffered, for example in the form of audited accounts or tax returns
- Comparison with similar areas outside the area affected by the oil spill
- Method of assessment of loss
- Saved overheads.

Claimants should indicate whether they have received any extra income as a result of the incident. For instance, fishermen who take part in clean-up operations may have been paid for their participation. Similarly, claimants should indicate whether they have received any aid or payments from public authorities or other international organisations in connection with the incident.

Claimants may wish to use advisers to assist them in presenting claims for compensation. Insurers will consider reasonable costs for work carried out by advisers in connection with the presentation of claims falling within the scope of the Conventions. The question of whether and to what extent costs are payable is assessed in connection with the examination of the particular claim for compensation. Insurers take into account the necessity for the claimant to use expert advice, the usefulness of the work carried out by the adviser, the quality of the work, the time reasonably needed and the normal rate for work of that kind. Excessive costs billed by advisers will not be reimbursed.

Environmental damage

It is clear from the revised definition of *pollution damage* in the 1992 Conventions that only costs incurred for reasonable measures to reinstate the contaminated environment may be accepted by the 1992 IOPC Fund and by insurers.

Costs for measures taken to reinstate the marine environment after an oil spill may be accepted under certain conditions. To be admissible for compensation, such measures should fulfil the following criteria:

- the cost of the measures should be reasonable
- the cost of the measures should not be disproportionate to the results achieved or the results which could reasonably be expected
- the measures should be appropriate and offer a reasonable prospect of success.

The measures should be reasonable from an objective point of view in the light of the information available when the specific measures are taken. In most cases a major oil spill will not cause permanent damage to the environment, as the marine environment has a great potential for natural recovery. There are also limits to what man can actually do in taking measures to improve on the natural process.

Compensation is paid by insurers only for measures actually undertaken or to be undertaken.

The above criteria apply to claims under the CLC. The MoEW considers that polluters should pay compensation for environmental damage and is preparing procedures to apply a formula to assess pollution damage based on criteria such as the size of the spill, the environmental sensitivity of the area affected and the length of the coastline impacted.

APPENDIX G: GUIDELINES FOR PUBLICITY AND RELATIONS WITH THE MEDIA

G.1 General Principles

The media will be on site immediately following a disaster. The media will often hear of a disaster at the same time as the emergency services, and they often arrive with them. On arrival, the media will expect to have access to the facilities they require. They will also expect an instant response to their requests for information and briefing. If these demands are anticipated, the media are less likely to add to what will already be a confused situation.

What do the media want?

It must be remembered that the media's objectives are not the same as the competent authority's. In general, the media has a hierarchy of priorities:

1. to arouse the readers'/listeners'/viewers' interest;
2. to get the facts right;
3. to get their stories in on time to meet their deadlines.

What does the public want to know?

It must be remembered that the media is acting as the voice of the general public. They will be asking the questions that the man in the street would like to ask. In general, their information needs will be straightforward:

1. What happened?
2. Why did it happen?
3. What are the authorities doing?
4. Will there be further developments?
5. What will be done to prevent such an incident from happening again?

It should be remembered that, in general, the representatives of the media will not be experts in oil spill response matters. The Media Liaison Officer appointed by the competent authorities will therefore have an in-built advantage in that:

- He/she will have a basic knowledge of the principles of oil spill response and will therefore be able to answer questions with an air of authority and competence;
- He/she will be closer to the sources of information and will themselves be briefed on the competent authority's combat and response strategies.

The objectives of the competent authority

The primary objective of the competent authority is, of course, to respond to the oil spill in the most practical and efficient way possible. However, it needs to be recognised that the authorities will, in fact, be fighting two battles simultaneously:

1. the appropriate response to the oil spill situation either at sea and/or on shore;
2. the relations with the media.

In many respects the media "battle" will be the more important of the two. In the long term, nature will itself correct not only the immediate consequences of oil spill damage, but also any errors on the part of the responding authorities in the execution of their combat strategy. Furthermore, the newsworthiness of the incident will quickly recede as it is overtaken by more interesting public events. This means that long-term clean-up operations are unlikely to be the source of much media interest.

The importance of the public relations aspects cannot be over emphasised. Even if the response to an incident works like clockwork in accordance with the contingency plan, it will be seen as a failure if the relations with the media have not been handled well. In many cases the response to an oil spill does not work precisely according to plan for a variety of reasons: some good, some bad. In such cases, good relations with the media are essential in order to ensure that the flow of information is controlled and the presentation of facts is not distorted.

G.2 Duties of the Media Liaison Officer

There are a number of details which need to be decided in advance of an incident and recorded in the contingency plan. These include the following:

1. Plan in advance where news conferences will be held.
2. Allocate a Press Room which will be used by the MELO as long as is necessary during the incident.
3. Allocate in advance the telephone and fax numbers on which the MELO can be reached by the media.
4. Find out in advance the telephone and fax numbers of the local and national newspapers, TV and radio stations. If possible, find out in advance the names of the correspondents who are likely to be sent to cover any oil pollution incident because of their areas of expertise. It is important to ascertain this information in advance so that the competent authorities can take a proactive line in defining their relations with the media rather than simply reacting to events.
5. Decide in advance the timing of daily news conferences. This is one less decision that has to be taken on the day.

Good preparation is more likely to lead to successful relations with the media. However, not everything can be determined in advance and it is good to adopt a watchword: **be flexible**.

G.3 The Press Release

It is important to adopt a proactive approach in dealing with the media. This ensures that the competent authorities are able to demonstrate that they are in command of the situation and

ensure that they convey the right message to the media. It also avoids the media picking up a distorted story from other sources - or at least, it renders this less likely.

A principal means of conveying information to the media is through the Press Release. The press release can be given out at the daily press conference or faxed in advance to the media correspondents.

There are a number of basic guidelines in preparing a good press release:

- keep it short - one side of a page if possible
- give the basic facts in short, uncomplicated sentences
- try and say something positive, i.e. what is being done to prevent pollution affecting sensitive areas
- be clear about the role of the authorities and what action they are taking
- put a contact name, address, telephone/fax number who can be contacted for further information.

In general, there are certain lines to avoid in issuing a press release. This is because they do not necessarily advance the cause of providing factual information and may, especially if they are subsequently proved to be wrong, damage the credibility of the competent authority. Therefore the press release should:

- not speculate about the cause of the incident
- not apportion blame to a particular person - this may well be the responsibility of the courts
- not admit liability for the incident
- not use technical jargon which will not be understood by the media or the public.

G.4 Interview Guidelines

The press release may be the best means that a competent authority has of conveying simply the basic facts about a pollution incident and may be the best opportunity to place on record what the authorities are doing in response to the incident. However, there are situations when the press release alone will not be sufficient. Journalists may wish to ask more detailed questions and the competent authorities should make every effort to ensure that they are answered fully and honestly.

In addition, the radio and TV will frequently wish to interview a responsible person from the competent authorities about the facts of the incident. The fundamentals of dealing with the media as described in the preceding paragraphs will all apply but, in addition, certain interview guidelines should be observed if the Media Liaison Officer is to give an effective performance:

- The information should be short and to the point. Long-winded statements annoy journalists and create problems for radio and TV editors.
- Write out in advance a list of the points you want to make and do not be afraid to repeat them if necessary, in response to questions.
- Keep the answers to questions short and simple.

- Memorise your most important statement and say it without referring to your notes.
- Stick to the facts: avoid conjecture and guesswork.
- Leave out unnecessary adjectives. A "small" spill of crude oil in industry terms is a "large" spill in journalistic ones.
- Remain on your guard at all times and consider every word you say as "on the record". A good journalist is never off duty.
- Keep your cool and pause to think before answering difficult questions. If you do not know the answer, say so and do not guess. If appropriate, offer to obtain the information as soon as possible.
- Remain in charge. Do not get flustered if the questions are difficult. If you think you have already answered a question, say so.
- Remember that journalists are not experts in this field. Be patient and calm. Answer questions in simple language and avoid technical jargon.
- Do not lose your temper even if provoked by aggressive questions.
- If necessary, have a blackboard or flip chart available to explain a complex point.
- If you are saying something and are interrupted, complete the point you were making before replying.
- If you did not clearly hear a question, or cannot understand a question, ask for it to be repeated. Do not answer until you have a clear understanding of what is being asked.
- Be natural but do not relax too much. Guard against lapses in concentration.

The above guidance is also applicable to handling press conferences where several journalists may be present, as well as conducting interviews with the radio and TV. At such press conferences, it may be appropriate to be assisted by specific experts to answer technical questions. But the experts should not take over the news conference; access to the views of experts should be channelled through the MELO who should normally chair the press conference. In this way it should be possible to guard against the emergence of contradictory messages.