

OIL SPILL CONTINGENCY
PLAN FOR FREETOWN
AND ENVIRONS

Freetown Oil Spill Contingency
Planning Committee.

November 1994

FREETOWN OIL SPILL CONTINGENCY RESPONSE PLAN

PREFACE.

In recognition of the inevitability of oil spills occurring and in compliance with Article 6 of the IMO* International convention on Oil Pollution Preparedness Response and Co-operation (OPRC) 1990 this oil spill contingency plan has been developed.

This plan consists basically of three parts:

- A. A Strategy section
- B. An Action and Operation section.
- C. A Data directory including maps

and is compiled so as to provide guidance for Emergency response teams to be capable of rapid and effective mobilisation of resources -men, equipment and materials - in the event of an oil spill occurring within the physical geographical boundaries of this plans scope.

The committee acknowledges that IPIECA* and the IMO* have through various agreements and conventions encouraged organizations associated with the transportation of oil products at sea to take due cognisance of the following statements when managing any operations related to the transportation, handling and storage of petroleum and petroleum products:

- It is of paramount importance to concentrate on preventing spills.
- Despite the best efforts of individual organizations, spills will continue to occur and will affect the local environment.
- Response to spills should seek to minimise the severity of the environmental damage and to hasten the recovery of the damaged eco systems.
- The response should always seek to complement and make use of m b a l forces to the fullest extent practicable.

It is the committees hope that this draft contingency plan will have its contents/ recommendations fully tested by a duly instituted/ Implementation Committee.

The Implementation Committee should be constituted/ comprise the following:

- 1) All members organizations of the original draft contingency plans
- 2) In addition to 1) above all Government, and NGOs that will be impacted or can provide emergency services in the case of an Oil Spill incident: fire brigade; law enforcement agencies (Police etc); medical authorities; local Government bodies: etc

*IMO International Maritime Organisations

* IPIECA International Petroleum Industry Environmental Conversational Association.

FREETOWN OIL SPILL CONTINGENCY PLANNING COMMITTEE
MEMBERS

ORGANISATIONS	MEMBERS' NAME
1. The Petroleum Unit	(a) Mr D M Mason (b) Mr S Conteh (c) Mr S M Clarke
2. Dept. of Transports & Communications	(a) Mr F Bockarie (b) Mr F S Pewa
3. Dept. of Trade, Industry & State Ent.	(a) Mr A J K Jalloh (b) Mr A Bakarr Kamara
4. Sierra Leone Ports Authority	(a) Capt. H A Bloomer (b) Mr M J Momoh
5. Republic of Sierra Leone Military Forces (Naval Wing)	(a) Lt Cdr. A A Koroma (b) Capt. S G Bangura
6. National Power Authority	(a) Mr M B G Timbo
7. National Tourist Board	(a) Mr A J Mbayoh (b) Mr S S Sowa
8. Metrological Department	(a) Mr J T O Pratt (b) Mr A Bockarie
9. Sierra Leone Petroleum Refining Co Ltd	(a) Mr E A W Scott
10. Mobil Oil S. L. Limited	(a) Mr E B Faulkner (b) Mr T M Sumana
11. National Petroleum	(a) Mr S Bakarr (b) Mr C Gray (c) Mr Seneviratne
12. Shell Sierra Leone Limited.	(a) Mr E A Obahiagbon (b) Mr C M Pessima

MEMBERS OF THE OIL INDUSTRY

- Sierra Leone Petroleum Refinery Company (in liquidation)
- Sierra Leone National Petroleum Limited
- Mobil (Sierra Leone) Limited
- Shell (Sierra Leone) Limited

The Committee during its deliberations have been guided by both the Shell Mosag visit report of H. Rance (May 1991) and the IPIECA report series - volume two - A guide to contingency planning for Oil Spills on Water.

Since the conclusion of the plans development, the Sierra Leone Petroleum Refinery Company status has recently changed: it has gone into receivership and is now under new private management/ownership. It is therefore our considered opinion that the Petroleum Unit, as the Government appointed monitors of the Oil Industry replaces the Sierra Leone Petroleum Refinery Company in all matters relating to Quality control and other issues that fall within their purview.

The Petroleum Unit has functioned, (and still functions) as the "Government body" overseeing the smooth running of the Oil Industry. They have introduced and maintained a system whereby bulk petroleum product imports are expected to meet acceptable standards of quality and have been doing this via the Sierra Leone Petroleum Refinery Company laboratory. With the laboratory's demise the Petroleum Units responsibility must continue.

On behalf of the members of the Freetown Oil Spill Contingency Planning Committee, we wish to thank government for giving us this opportunity to serve and hope that this draft plan will enable an effective and tested National Oil Spill Contingency Plan be fully operational in the very near future.

E.A. Obahiagbon
Chairman Freetown Oil Spill Contingency
Planning Committee

ACKNOWLEDGEMENT

As part of the Sierra Leone Governments concern for the effects of spilt oils resultant damage its beaches and the shoreline ecosystem, the Honourable Secretary of State Department of Transport and Communication set up a working group in June 1993 to produce an effective National Oil Spill Contingency Plan. This working group was formally instituted under the Chairmanship of the Petroleum Unit.

To facilitate the speedy development of a National Plan, the Working Group set up two committees:

- 1) The Freetown Oil Spill Contingency Planning Committee.
- 2) The Nitti Oil Spill Contingency Planning Committee.

The Plan presented in this document is that of the Freetown Oil Spill Contingency Planning Committee.

As part of the development of this Oil Spill Response Plan, the Freetown Committee of which Shell is the Chairman commenced in July 1993, the development of an Oil Spill Contingency Plan for the Freetown area and environs. The Committee developing the plan consist of members drawn from below organizations.

GOVERNMENT BODIES

- The Petroleum Unit - Government body overseeing the oil industry while acting as Government Management Organization of imported petroleum products brought in World Bank and EEC funding
- Department of Transport and Communication - overseeing Department Ministry Ports Authority and other related Institutions.
- Sierra Leone Ports Authority.
- Department of Trade, Industry and State Enterprises - . Overseeing Department (Ministry) of the Petroleum Unit.
- Republic of Sierra Leone Military Forces -Naval Wing
- National Tourist Board.
- Meteorological Department
- National Power Authority - sole suppliers of electricity for Freetown Area

FREETOWN OIL SPILL CONTINGENCY RESPONSE PLAN STRATEGY

1.0 INTRODUCTION

The emergency response plan will follow the following strategies depending on the situation prevailing.

1. Monitoring: -to be employed immediately an oil spill occurs and secondly, to allow the forces of nature to come to play in the dispersing of the spilt products.
2. . The use of dispersants: this strategy shall only be used:
 - a. If and when the spilt product would have been monitored and found to be persistent.
 - b. When the spill is considered to be persistent and must be broken up to prevent damage to the ecosystem or tourist value.
 - c. If dispersant is approved by the Department of Transport and Communications.
3. Clean-up: shall be employed if strategies (2a) and (2b) above are found to be inappropriate to the situation. TNS therefore means that a clean up exercise shall only take place when sufficient meteorological data would have been received together with the situation concerning currents and tides as being unable to disperse the products spilt and also, when consideration would have been given to the use of dispersants as hazard to marine life and a threat to tourist facilities around.

1.1 AUTHORTIES AND RESPONSIBILITIES OF COORDINATING COMMITTEE

The Harbour Management, the Naval Wing and other mariners within an area wherein an oil spill has taken place shall be predominantly responsible for initial management after reporting oil spills to the relevant authorities:

1.1.1 The Harbour Master or his deputy or representative will be the Overall Commander (contact tel. # 250345, Home: 230469). He in turn will inform, the Principal Planning Officer (Tel. Office: 222130, Home: 25 1049) of the Department of Transport and Communications for the attention of state authorities. Simultaneously the Deputy Harbour Master shall alert the On-Scene Commander, the Meteorological Department for meteorological information and also issue Notices to all Mariners (NOTAMS) at intervals operating within the spillage area. If the spill occurs in a tier three segment and having assessed the situation together with the On-Scene Commander an alarm may be raised for emergencies beyond the competence of the response plan available in Sierra Leone. This initial reporting should be carried out in conformity with the Notification and Alerting procedure as shown in subsection 1-1 and 1-2 of the Actions and Operations Section.

1.1.2 In the event that international assistance and clean-up equipment are required from outside to cope with for instance, a Tier three emergency response situation, the movement of such equipment and men required for the oil and spill management clean-up exercises shall be done with little or no hindrance at all i.e. no custom duty shall be paid on such equipment or they would have been catalogued and are to be taken back after the clean- up exercise. Immigration requirements shall be promptly

accorded to personnel accompanying the equipment and taking part in the exercise at the port of entry. The necessary authorities for above waivers shall be supplied by the Heads of the Department of Finance and Internal Affairs after an official request is made by the Head of Department of Transport and Communications.

1.3 DIMENSIONS OF PLAN

The geographical area of relevance extends from the Northern border of Sierra Leone and Guinea to the southern border of the Freetown Peninsula: this also includes the Sierra Leone River, its creeks, inlets, and the assorted coves along this shoreline. The plan is based on a three tier response system:

1. Tier one includes oil spills close to and within terminal areas of operation and shall be the responsibility of all operational organisations handling oils and other substances within those terminals. The volume of oil spill would invariably be under 10 metric tons (MT)
2. Tier two oil spills shall be considered as spills having a total volume of 10 - 31 MT and which are considered by the operating organisation to be too large for them to competently handle. The operations involved cover product movement/storage at Company premises, multi-user facilities or in public location including the high seas i.e. the involvement of all authorities and responsibilities as stated in 1 .I of this strategy.
3. Tier three emergency response shall involve the National Emergency Response Plan as already indicated above. In the event that the response capabilities of Sierra Leone are far inadequate to manage the spilt product, the Departments of Transport and Communications and Foreign Affairs shall be required to open diplomatic channels for securing assistance outside Sierra Leone in such cases.

1.4. INTERFACES WITH OTHER PLANS

This emergency plan shall always be an integral part of an overall national crises response and development plan prepared for Sierra Leone.

2.0 OIL SPILL RISKS

2.1. IDENTIFICATION OF ACTIVITIES AND RISKS

Various activities can produce a situation in which a high risk of spilling oil will occur: Poor navigation within the territorial waters or waters under the jurisdiction of Sierra Leone and also poor operational handling of tanks and pipe arrangements on board tankers are some of the high risk situations.

The risks involved in these types of activities leading to possible pollution of the sea can be broadly referred to as:

- Failure of hoses.
- Failure of valves.
- Tanker/ship accident (collision or grounding).
- Accidental spillage during ship to ship transfer i.e. bunkering at sea.
- Pipeline failures.

- Collisions of vessels leading to oil spills within the channel.
- Captains sometimes ignoring statutory mandates of picking up local pilots and navigating by themselves can also lead to grounding and consequent oil spills.
- Tank ruptures due to failure, damage or explosions

2.2 TYPES OF OIL LIKELY TO BE SPILLED

Predominately it is non-persistent oil but in the event of crude oil imported for the processing to other products, persistent oil can be spilt within the territorial waters and the contiguous zone. Also because of the huge tanker traffic from Nigeria, Gabon, Cameroon, Latin American states to Europe and South Africa the tendencies are that there can be spillage from collision of I and explosions on tankers in the exclusive economic zone of waters under the jurisdiction of Sierra Leone.

Type of oils likely to be spilled also includes:

- Heavy Fuel Oil
- Bitumen
- Crude discharges from passing crude tankers.
- Fuel, diesel oil and white fuels

2.3. PROBABLE FATE OF SPILLED OIL

In the territorial and contiguous zone, favourable forces of nature can work on the non persistent oil and as such they will not require my clean up exercise.

Non favourable climatic conditions could necessitate any of the numerous action as stated in sub sections 1.2 - 1.8 of actions and options section.

Oil spills can create toxic emulsions that will affect Living and non-living resources of the sea. Such compounds will evaporate with time. The persistent oil, if allowed to reach the coastline will pollute beaches, mangroves, the sea shore, etc and will travel along the coastline with the tide. Water intake for plant cooling system will also be affected.

2.4 DEVELOPMENT OF OIL SPILL SCENARIOS

This contingency plan is based on the premise that a tiered response scheme is in place. This tiered response expects that all organisations have developed functional tier one response action plans and that oil spills necessitating Tier two and Tier three responses will be managed by the Freetown Oil Spill Contingency Planning Committee and the National Oil Spill Contingency Planning Committee respectively.

Below are listed possible Tier two Oil Spill Scenarios that this contingency plan deals with:

- i. Operational accident during product transfer between a tanker and a shore tank or vice versa.
Hose or pipeline failure during such a transfer especially if same has gone undetected for my length of time could result in considerable spillage.

- ii. Within the harbour, a minor marine accident between two vessels or a tanker and the jetty could result in oil spillages of up to 500 h4T from the wing tanks of a tanker or loaded barge.
- iii. Vessels and tanker passing through Siena Leone territorial waters engaged in bunkering operations could result in considerable quantities of oil spill.
- iv. There is the risk, although currently considered very low, of a major spill resulting from a passing laden tanker. Many of such tankers pass some 20 – 40 miles off the coastline of Sierra Leone en route from Nigeria, Cameroon and Gabon to Europe. Other laden tankers from the Middle East apparently pass further offshore.

2.5 SHORELINE RESOURCES. PRIORITIES FOR PROTECTION

Sierra Leone has a rich marine resources and her population depends predominantly on marine resources which includes fish for protein. The resources which have priority for protection also include sandy beaches, swamp farms, shell fish production, spawning ground for fish and mangrove swamps.

2.6 SHORELINE SENSITIVITY MAPPING

Extreme care should be taken during the management of an oil spill incident. In sub section 2.2.2 of the actions and operations section the mapping of the sensitive areas along the shoreline and recommended treatment/actions are stated for strict compliance.

2.7 SPECIAL LOCAL CONSIDERATIONS

Due to the importance of Marine life, physical containment and manual clean up should be the primary oil spill response technique. Dispersants can only be used after written approval is given. See special conditions along the shoreline sub section 2.2.2. of actions and operations section.

3.0 SPILL RESPONSE STRATEGIES

3.1 PHILOSOPHY AND OBJECTIVES

The philosophy is to use as little or no chemical inputs in clean-up exercises and to allow the forces of nature to play the greater part in dispersing whatever oil spills that may occur with the main objective of having cleaner waters with as little as 5 parts per million (PPM) of the presence of any oil with the waters.

Based on the aforementioned philosophy, the objectives are firstly to reduce toxic chemical introduction resulting from the use of dispersants and secondly, to minimise cost involved in the clean up operation.

3.2 LIMITING AND ADVERSE CONDITIONS

The limiting conditions along the coastline are predominantly North and North East of the Sierra Leone River with predominantly mangrove vegetation along the coastline. There are no adverse conditions for clean up operations.

3.3 SEA ZONES AND RESPONSE STRATEGIES

In the event of an Oil Spill in any sea zone the following response strategies are recommended:

- Monitoring
- Containing
- Clean-up/ dispersing oil particles

Monitoring

This strategy will involve the use of meteorological data prevailing at that time and the meteorological data that would be expected the following day. Equally so, the position of the movement of current and tides would be extremely essential to understand, as tides in particular be either flooding or ebbing in which case one would be assured of the possible effects of such on the type of oil that would have been spilled. If the day time temperatures are extremely high and can influence any substance on the surface of waterbodies, then one can be assured that with temperatures in the high eighties, some amount of dispersing or melting of oily substances of the water bodies can take place. Also, the influence of winds on water surfaces either during the day or night periods can have an influence in affecting the viscosity of the oil and the point in time.

As part of the monitoring exercise aerial surveillance should be considered

Containing

For this particular exercise, spills close to the show line, equipment and materials that are capable of containing oily substances should be used.

For containing oily substances within the 5 - 24 nautical mile area it is recommended that booms be the predominant equipment to use as the flow of the stream/currents would be stronger in such areas than is possibly the case very close to the shore line.

Clean-up/dispersing oil Particles

Clean up exercises for areas relatively close to the shore should involve either digging of trenches or making available tank facilities for collecting oily residues from the sea face to be deposited in tank containers that may be available. To enable the use of cheap labour that may be abundant in this part of the world, buckets, wellington boots, rubber gloves, shovels and appropriate clothing are recommended to be kept together with booms and skimmers that may be available.

3.4 COASTAL SHORELINE RESPONSE STRATEGIES

3.4.1 Exposed rocky headlands salt marshes/mangrove

Mangroves are essential to the urban communities of Sierra Leone as necessary fuel wood, as well as stabilisation and protection of the shoreline, provision of breeding and feeding grounds for numerous species of fish and prawns, etc. In the event of a pollution incident, especially if the spilt oil is persistent, damage could last for years and affect the mangrove itself. Cleaning of salty marshes and mangroves by burning or cutting is usually undertaken if the area is heavily soiled. Therefore in such areas we recommend that booms and absorbing materials should be used to protect the areas from pollution

3.4.2 Eroding wave-cut platform

Monitoring is predominantly recommended. Most oil would have been removed by natural processes within weeks.

3.4.3 Fine grained sand beaches

Mechanical/manual removal is recommended as oil does not penetrate into the sediment.

3.4.4 Coarse grained beaches mixed sand and gravel beaches

For mixed sandy and gravel beaches along the coast of Sierra Leone, limited monitoring is recommended but the strategy of containing the oil is most preferable as Sierra Leone cherishes such beaches for a recreation purposes.

3.4.5 Sheltered rocky coasts

Considering the wave and tidal actions along the coasts of Sierra Leone the best strategies recommended for such areas are:

- a. Monitoring
- b. Clean-up if the spilled oil is heavily concentrated

It is also recommended that shovels be made available, if the pollution is that of persistent substances. In the event that the pollution is that of non-persistent type comprising of oily substances more than 30 PPM, the forces of nature should be allowed to come into play. In the event of persistent oily substances occurring in distances from the five mile limit up to or over the 24 mile limit and having been observed for some time with no success of it dispersing through the forces of nature, dispersants are recommended to be used.

In the event that pollution is occurring in an area that could be a serious threat to the marine environment of Sierra Leone, boats from the Naval Wing and the Sierra Leone Ports Authority could be used to tow the vessel distressing the marine environment to safety outside the limits of our exclusive economic zone.

4.0 EQUIPMENT SUPPLIES AND SERVICES

4.1 PRIMARY OIL SPILL EQUIPMENT

This is to be procured by Sierra Leone and shall include:

- Booms
- Skimmers
- Barges
- Storage tanks
- Boats
- Auxiliary equipment shall include:
 - Buckets
 - Shovels

4.2 INSPECTION, MAINTENANCE AND TESTING

This equipment shall be inspected and tested every month (for that equipment and should they require maintenance, the Oil Companies and Sierra Leone Ports Authority shall undertake the maintenance of such equipment that are stored by them-and used for oil spill management/clean up.

4.3 AUXILIARY EQUIPMENT, SUPPLIES AND SERVICES

These shall include buckets, vessels and tanks to receive oily wastes.

4.4 SUPPORT EQUIPMENT, SUPPLIES AND SERVICES

Wellington boots, rubber gloves, shovels, appropriate clothes (quantities to be supplied in due course)

5.0 MANAGEMENT, MANPOWER AND TRAINING

5.1 CRISIS MANAGER AND FINANCIAL AUTHORITIES

The crisis Manager shall be the Principal Planning Officer in the Department of Transport and Communication with the responsibility to mobilise resources from all concerned agencies. For the purpose of prompt response, the department should operate an emergency account locally.

5.2 INCIDENT ORGANISATION CHART

(See attached)

5.3 MANPOWER AVAILABILITY (ON-SITE/ON-CALL)

Naval Wing shall provide the initial on-site manpower. Their personnel will remain on duty as long as is required.

5.4 AVAILABILITY OF ADDITIONAL LABOUR

This shall be recruited from the Disciplined Forces, which shall consist of Fire Forces- Freetown Fire Brigade, SLPA Fire Force, SLAA Fire Force and the SDD Branch of the Sierra Leone Police Force and dependant on relevant skills required.

5.5 ADVISORS AND CONSULTANTS

Mobil, Shell and National Petroleum of Sierra Leone shall always assist in providing advisors and consultants. The multinational oil Companies would be expected to avail the contingency planning committee as provided by their parent company oil spill consultants.

5.6 TRAINING/ SAFETY SCHEDULES AND EMERGENCY EXERCICES

Training and safety schedules shall always be undertaken in Sierra Leone with the help of the advisors and consultants and shall be expected periodic emergency exercises to be undertaken by the trained personnel.

6.0 COMMUNICATION AND CONTROL

6.1 INCIDENT CONTROL ROOM AND FACILITIES

The incident control room shall be the signal office located in the Harbour Division of the Sierra Leone Ports Authority.

6.2 FIELD COMMUNICATION EQUIPMENT

Predominantly, VHF telephone equipment will be used, and dedicated channels 18 or 19 shall be used at all times during emergency operations initially, calls should be made on channel 16 and subsequent linking with channel 18 or 19 will be made upon request).

7.0 POST SPILL FOLLOW UP ACTION

7.1. INVESTIGATIONS

At the end of every clean-up exercise, the Department of Transport and Communications shall appoint a team of casualty investigators to look into the causes of the spillage and they shall be required to submit their findings for the state authority of Sierra Leone to improve on their safety measures should they be found wanting or lacking. The casualty investigators

shall either come from outside Sierra Leone or from within or a blend of both local and foreign investigators. It will always be the duty of the Department of Transport and Communications to forward the report of the casualty investigators to the International Maritime Organisation (LMO).

7.2 LITIGATION

In the event of a spillage occurring in the waters of Sierra Leone the process of litigation shall be carried out in the law court of Sierra Leone

The casualty investigators shall hold themselves in readiness to appear before the courts of law should they be required for the litigation process.

7.3 CLAIMS

Claims for damages made to the marine environment of Sierra Leone shall be computed:

i Based on the loss of the touristic value and this shall be worked out by both the Department of Tourism and the National Tourist Board;

ii Claims shall also be made against the defaulter in respect of the loss of the maximum allowable catch of the fisheries through the Department of Marine Resources.

iii Claims for the damages from other sources shall also be submitted for consideration;

iv Claims shall also be made against the defaulter in respect of equipment, materials and labour used in the process of cleaning up and the polluters/vessel owners shall be required to meet all those costs of charges.

8.0 CONTACT TELEPHONE NUMBERS

1. Overall-Commander (Harbour Master)

Office - 250345

2. On-Scene-Commander (Lt. Cdr. -Naval Wing of RSLMF)

Office - 222284

3. Principal Planning Officer (Dept. of Transport & Communications)

Office - 222130

4. The Director, Petroleum Unit

Office - 229481, 227372

5. Meteorological Department (Director)

Office - . 226692, 226691

B. ACTION & OPERATION

1.0. INITIAL PROCEDURES

1.1 REPORTING INCIDENT, PRELIMINARY ESTIMATE OF EMERGENCY

Any persons or vessels who observe an oil spill will call the Signals office of SLPA on channel 16 and report the incident, stating the location, suspected type of oil, vessels' identity, probable cause of spill, time and any other pertinent data.

The committee will as much as possible try to educate users of waterways about this procedure.

In case the person has no access to a radio, he can call the Harbour Master or his deputy at SLPA or the Commander of the Naval Wing and report the incident.

1.2 NOTIFYING KEY TEAM MEMBERS AND AUTHORITIES

The Deputy Harbour Master or representative will be the Overall Commander (OAC).

The commander of the Naval Wing RSLMF or his deputy or representative will be the On-Scene Commander (OSC).

The OAC will inform the OSC about the incident and the latter will immediately visit the scene for initial assessment and report his findings to the CAC.

The OAC will set up the incident Control Room in the Signals office at the Harbour Division of SLPA.

The OAC will have the responsibility to assemble the members of the team in the shortest possible time after which the On-Scene Commander will take over the operation.

Method of communication will be by telephone, radio, verbal messages, or any other means available.

Whilst the OSC is preparing to go into operations, the OAC will contact authorities such as Fire Force, Department of Transport & Communications, Department of Trade, Industries & State Enterprises, Department of Lands, Housing & the Environment, National Tourist Board; Department of Agriculture & Forestry, Inspector General of Police, Meteorological Surveys, the oil companies, shipping agencies.

1.3 ESTABLISHING & STAFFING CONTROL ROOM

Three control posts will be established as follows:

- a. The main control room or Incident Control Room will be equipped with VHF telephone equipment and dedicated channels 18 & 19 shall be used at all times during the emergency.

The OAC will advise on staffing of the ICR which will comprise of SLPA signal men at the Signal Station of the Pilots Office.

- b. Forward control room will be set up in the Naval patrol boat or vessel being used by the OSC and will be near the scene of the oil spill. (The boat's crew and a military personnel will man the radio)

- c. The Rear Control Post which will & the stand-by resource centre will be set up on shore closest to the scene of the oil spill. This can be either SLPA, NPA, KOJ, Sierra Fisheries

1.4 COLLECTING INFORMATION

The following information will be required:

- a. Oil type - whether petrol or kerosene which are non-persistent or diesel, fuel oil, lub.oil, crude oil or bitumen which are persistent.
Responsibility - SLPRC
- b. Sea/wind forecast - sea condition, wind direction and strength.
Responsibility - Meteorological department.
- c. Aerial Surveillance - the use of helicopter or light aircraft should be considered.
Responsibility - Department of Transport & Communication
- d. Beach Report - whether the spill has impacted the coast line and beach resorts.
Responsibility - Tourist Board

1.5 ESTIMATING FATE OF SLICK

The OAC will determine the fate of slick to be within 24, 48 and 72 hours, depending on the weather and tidal conditions. The OSC will determine the size of the spill to be tier 2 or tier 3 and structure the response accordingly.

1 6 IDENTIFYING RESOURCES AT RISK AND WORM PARTIES

Factors affecting risks are as follows:

Type of oil, geographic location, weather and sea condition, coastline, volume of traffic, time of day, navigation hazards, quality of vessels, quantity and frequency of handling this type of operation.

The resources that will be directly affected by the spill will be determined by the OSC or his: designated deputy.

If the spill is persistent and will affect marine life and mangroves the Permanent Secretary in the Department of Agriculture and Natural Resources will be informed.

Depending on where the spill occurs, if there are geographical areas nearby that could be identified as being at higher risk, then the OSC will request, depending on the tidal movement, that booms or rope skimmers be deployed to halt the spill's drift toward that arm. These risk areas are mapped out in the Data Directory.

1.7 DECIDING TO ESCALATE RESPONSE TO HIGHER TIER

This decision will be made by the OAC after consultations with the OSC and other member of the contingency committee.

- a. If the spill source cannot be shut-off and the vessel or tank contain in excess of 10 MT but up to 500 MT.

- b. If the oil is persistent in nature
- c. If the temperature condition will not allow the oil to evaporate.
- d. If the wind and tidal condition tend to move the oil towards the coastal areas.
- e. Adverse reports on extent of spill from monitoring aircraft
- f. Report from the distressed vessels about the magnitude of the spill.

1.8 CONTACT EXTERNAL AGENCIES

In the case of a major oil spill that is tier 3 in which the response capabilities of this country, is inadequate to manage it then the Departments of Transport and Communications and Foreign Affairs will arrange to seek international assistance first from Nigeria and then from Oil Spill Service Centre (OSSC) in Southampton. The assistance from abroad in terms of expertise and equipment will work in conjunction with the OEAC and the rest of the contingency team.

2.0 OPERATIONS. PLANNING & MOBILIZATION PROCEDURES

2.1 ASSEMBLING FULL RESPONSE TEAM

The response team will comprise the following:

- a. On-scene Commander (OSC)
- b. Field Operations Manager - nominated by On-Scene Commander, (preferably Manager of NAPETCO Sierra Leone)
- c. Assistant Field Operations Manager - Operations Manager of National Petroleum
- d. Marine Operations Superintendent - A practising mariner, as specified by the OSC
- e. Containment Recovery and Disposal Supervisor - SLPRC
- f. Rear Control Post Supervisor – Operation Manager, Mobil
- g. Assistant to Rear Control Post Supervisor - nominated by (f)
- h. Food, Shelter and Transport Supervisor :Operations Manager, SLPA
- i. Assistant to Food Shelter and Transport Supervisor - Manager, Planning and Development, SLPA
- j. Communications Supervisor -Head of MARCONI Workshop, SLPA
- k. Maintenance Supervisor - SLPA and his team will include one each of electrician and mechanic.
- l. Field crew: three operators each from SHELL, Mobil, National Petroleum, National Power Authority, Naval Wing Sierra Leone Ports Authority, NAPETCO (SL)
- m. Documentation Manager - Representative from SHELL. He will nominate his documentation team

The OSC will assemble this team by either radio or telephone contact and also determine an assembly point, depending on the location of the spill, from where the group will move to the REAR CONTROL POST (PCP) which will be based on-shore.

2.2 IDENTIFYING IMMEDIATE RESPONSE PRIORITIES

2.2.1 The OSC will effect the following:

- a. ?
- b. Roads and surrounding gates and entrances in the vicinity of the Rear Control Post and all areas suspected to have dangerous levels of fumes are kept clear of traffic. The connecting main road traffic will be supervised by police personnel
- c. The contingency equipment and safety clothing will be assembled in the Rear Control Post close to the spill.
- d. Communication set and all other electrical equipment should be intrinsically safe and will be housed at the Rear Control Post.
- e. Food supplies will be brought to the Rear Control Post as and when appropriate
- f. Vehicles and boats for the operation will be assembled within h s same area
- g. Information on weather forecast will be requested from Meteorological Division.
- h. The designated safety officer will be responsible for safety and will make sure that no ignition source is around as well as controlling the influx of people in the area.

2.2.2 The response priorities will be as follows:

- a. Non-persistent monitoring and reporting. However if the current brings it towards shore, then booms and skimmers will be deployed to contain and recover it.
- b. Persistent: if it is towards the high seas, we leave it to disperse naturally but we continue to monitor. If it is coming towards shore, then booms and skimmers will be launched to capture and recover, using pumps.

In case of 2.2.26 above, vessels from NP will be utilized to pump

2.3 MOBILIZING IMMEDIATE RESPONSE

Having assembled the full team at the Rear Control Post, the OSC will select the following to move to the Forward Control Post:

(A) NON-PERSISTENT

On-Scene Commander
Field Operations Manager
Marine Operations Superintendent
Containment, Recovery and Disposal Supervisor
Disposal Supervisor
Boat's permanent crew

The remaining members of the Response Team will be on Standby at the Rear Control Post

Equipment

1. Boat (NAPETCO, King Jimmy, Small Craft, Naval Boats)
2. Tank Barge - Tug Nitti will tow barge Bradford.
3. Booms
4. Skimmers
5. Diesel engine driven pumps 2 off
6. Galvanised buckets (34cm) 4.5 gallons 20 off
7. Ropes - Manilla: 1 1/2", 3/4", 1" 100 yds each
8. Wellington Boots size 8 5 off
(Non-slip type) size 9 5 off
size 10 5 off
- Rubber Gloves (up to elbow) 15 off
- Raincoats 30
- Coveralls 30 sets
- Safety Helmets
- Respirators 30
9. Basic First-Aid Kit 4 off
10. Dry Powder Fire Extinguishers 2 off
11. 5 KVA standby generator
12. Torchlights 30 off

B) PERSISTENT

The FULL RESPONSE TEAM will be formed into shift as necessary and deployed and advised by the On-scene Commander.

Additional labour shall be recruited from Freetown Fire Force, SLPA Fire Force, SLA Fire Force, SSD, SL, Police Force.

The Boat's permanent crew will also be deployed.

Equipment

1. Boat (NAPETCO, King Jimmy, Small Craft, Naval Boats)
2. Tank Barge - Tug Nitti will tow barge Bradford.
3. Booms
4. Skimmers
5. Diesel engine driven pumps 2 off
6. Galvanised buckets (34cm) 4.5 gallons 200
7. Ropes - Manilla: 1/2", 3/4", 1", 1 1/2", 2" 200 yds each
8. Protective clothes
Wellington Boots size 8 9 off
(Non-slip type) size 9 9 off
size 10 6 off
size 11 50 pairs
- Rubber Gloves 50

Raincoats	50
Coveralls	50 sets
Safety Helmets	50
Respirators	50
9. Shovels	50
10. Dispersant	20
11. Scoop (small bowls)	
12. Basic First-Aid Kit	
13. Dry powder fire extinguisher 6 off	6 off
14. Pickaxes, cutlasses:	

NOTE: Protective clothing should be properly labelled with the users designation.

2.4 PREPARING INITIAL PRESS STATEMENT

The On-Scene Commander in consultation with the Overall Commander from information already received from 1.4 will draft a situation report and send to the Department of Transport & Communication for necessary action.

The Overall Commander will assist the Department of Transportation and Communication in preparing the press statement.

2.5 PLANNING MEDIUM TERM OPERAYION

a. 24 hours operation

Two shifts of 12 hours per shift.

The On-Scene Commander will have overall supervision over all the shifts and appoint the Field Operations ~ a n a g e r n d Assistants to run the individual shifts

The Field Activities group will split into two

All other support groups will split into two to handle the two shifts

b. 48 hours operation

As per 2.5 (a) above

c. 72 hours operation

If the emergency is considered to still exist or its level of importance increased, then the response below should be applied.

Three shift of 8 hours per shift

The On-Scene Commander will have overall supervision over all the shifts and will appoint Field Operations Manager and Assistants to run the individual shifts.

The Field Activities and Superintendents' groups will also split into three.

2.6 MOBILIZING OR PLACING ON STANDBY RESOURCES REQUIRED

All equipment and personnel will be moved to the Rear Post Control Point on the instructions of the On-Scene Commander.

Depending on the place where the Rear Post Control Point is located, we may or may not need small craft to ferry equipment and personnel to the Forward Control Post.

If a small craft is required the facilities at SLPA will be utilised.

The equipment and personnel required for the type of spill will be determined by the On scene commander and the remaining kept as reserve at the Rear Post Control Point.

The team and equipment will now move to the Forward Control Post under the command of the On-Scene Commander.

2.7 ESTABLISHING FIELD COMMAND POST AND COMMUNICATION

The Field Command Post will be set up on the vessel where the On-Scene Commander will be.

A VHF radio will be installed there, tuned to channel 18 or 19 and manned by at least two radio operators per shift. From this command post, the On-scene Commander will communicate with the Overall Commander on the progress of the exercise and also with the Rear Post Control Supervisor.

3.0 CONTROL OF OPERATIONS

3.1 ESTABLISHING A MANAGEMENT TEAM WITH EXPERT AND ADVISORS

- a. Overall Commander
Responsible for ensuring that the corporate response to any incident is consistent with the strategic, operational and communication policy requirements
- b. On-Scene Commander
Responsible for the implementation, effectiveness and resource management control of the entire oil spill clean up personnel at the spill scene. He will also be responsible for the overall set-up and administration of the emergency locations utilized by the team.
The On-Scene Commander will nominate a military personnel to handle all security matters related to the spill operation.
- c. Crisis Manager
He will be the Principal Planning Officer in the Department of Transport and Communications with the responsibility to mobilize resources from all concerned agencies.
- d. Field Operations Manager
He will be the Second-in-command to the On-scene Commander and responsible for all field operations in the cleaning of the oil spill.

He will be responsible for providing a continuous, accurate record of the movement of the spilled oil, designating areas affected and potentially affected.

He is also responsible for the effective containment of recovery and clean-up operations at the spill site.

e. Government Agency Liaison Adviser

He will be responsible for the following:

- advising the Overall Commander on liaison with the various government agencies involved and ensuring that relevant regulations are being followed.
- anticipating any legal action that could result from the spill and/or clean-up, and providing the necessary advise to handle these matters.
- supply of information to the news media and other audiences on aspects of the spill and its clean-up or containment progress.
- coordinating the handling and settlement of all third-party claims and complaints, resulting from the marine casualty, and providing liaison between ship owner and insurer.

He will be a representative from the Department of Transport and Communications

f. Containment, recovery and disposal Adviser

He will be responsible for the following:

- providing expertise in disposing of recovered oil and oiled debris in a safe and efficient manner.
- providing expertise in the use and handling of chemicals such as dispersants, detergents and other non-mechanical methods or materials used in combating oil spills.
- providing expertise as to the use of mechanical equipment for the containment and recovery of oil for the existing condition.

He will be a representative from SLPRC

g. Environmental Adviser:

He will be responsible for continuously assessing damage and potential damage to the environment and advising the On-Scene and Overall Commanders on response techniques to minimize the hazards.

He will be a representative from the Department of Marine Resources

h. Marine Operations Superintendent

He will be responsible for the following:

- The physical containment of the spilled product at the distress vessel and for providing advice on the type of marine craft the docking facilities required and in

collaboration with the Safety Adviser, map out the safety practice that must be followed in the use of these crab.

- the necessary liaison on matters concerned with vessel safety, provision of night time lighting and my salvage activities.

He will be a representative from Napetco (Sierra Leone) Limited

i. Safety Adviser

He will be responsible for providing expertise on the safe practices to be followed in both in the land and sea operations for the oil spill clean-up, containment, recovery and disposal.

He will be a representative from SLPRC

j. Containment, Recovery and Disposal Supervisor

He will be responsible for supervising all aspects of containment and recovery operations both on land and sea, including personnel and equipment deployment. He will liaise with the Marine Operations Superintendent as they have some common duties, supervising the disposal of recovered oil and oil debris.

He will be a representative from one of the oil companies

k. Rear Control Post Supervisor

- His primary responsibilities will be for all land operations relating to the oil spill and will report to the On-Scene Commander. In addition, he will have the following responsibilities:
- supervising all aspects of shore and inland clean-up operation, including both personnel and equipment deployment.
- The prompt supply of all equipment, manpower and materials required for the cleanup operation as determined by the Field Operations Manager.

He will be a representative from one of the oil companies

l. I Food, Shelter and Transport Supervisor

He will be responsible for the following:

- providing food and shelter for all personnel associated with the oil spill response
- obtaining the necessary vehicle - and utilising them in a safe, efficient and reliable manner for the transportation of personnel and materials to and from the spill site.

The choice for this position rests with the On-Scene Commander

m. Communications Supervisor

He will be responsible for establishing, operating and maintaining an effective communication network both at the spill site, and to and from the spill site.

He will be a staff of SLPA

n. Maintenance Supervisor

He will be responsible for the repair and maintenance of any modifications/alterations to the equipment for the oil spill operation.

He will be a staff of SLPA if the dedicated equipment are stored there.

Other equipment in other oil terminals that could be used will be constantly maintained by the maintenance staff in that terminal.

o. Documentation Manager

He will be responsible for maintaining a complete and accurate record of all events that occur, in chronological order and supported with as much quantitative data as possible (Pictures, videos, texts, interviews, notes, tapes, tests, etc).

He will be a representative from SHELL (SL) LTD since they presently operate an equipped library system and they also initially prompted the oil spill contingency awareness.

3.2 UPDATING INFORMATION

The under mentioned information will be updated by the following:

- | | |
|--------------------------|--|
| a. Oil | SLPRC |
| b. Sea/wind forecast | meteorological Department |
| c. Aerial surveillance | Department of Transportation & Communications |
| d. Beach report | Tourist Board |
| e. Marine resource types | Department OF Marine Resources volumes and costs |

They will be expected to report on the actual condition prevailing as compared to information supplied under 1.4 above.

3.3 REVIEWING AND PLANNING OPERATIONS

- a. After the team is assembled at the Forward Control Post, the On-Scene Commander will review each team members' responsibilities for the oil spill containment/clean-up
- b. Depending on the size and nature of the spill, the On-scene Commander will decide whether it will be a 24, 48 or 72 hour shili operation. Persomel will then be deployed in their various capacities and posted as under 3.1 above.
- c. The Operational vessel with equipment and personnel nominated by the Om-scene Commander from those listed under 2.3 above will now depart to the scene of the spill on the order of the On-Scene Commander and under the supervision of the Field Operations Manager The remaining equipment and personnel will be on standby at the Rear Control Post.
- d. On arrival at the scene, the appropriate equipment will be deployed.

3.4. OBTAINING ADDITIONAL EQUIPMENT, SUPPLIES AND MANPOWER

Depending on the progress of the operation and in consultation with the On-Scene Commander, the Field Operations Manager will request for additional resources and these will be sent by the Rear Control Post Supervisor to the spill scene using the workboat(s).

3.5. PREPARING DAILY INCIDENT LOG AND MANAGEMENT REPORTS

The Documentation Manager will maintain a log of events in the following format:

- a. CLASSIFICATION (whether doubtful, probable or confirmed)
- b. DATE AND TIME of pollution report and identity of observer.
- c. POSITION AND EXTENT OF POLLUTION
- d. TIDE and WIND (speed and direction)
- e. WEATHER condition and SEA state
- f. CHARACTERISTICS OF POLLUTION
- g. SOURCE and CAUSE of pollution
- h. Details of VESSELS IN THE AREA
- i. PHOTOGRAPHS and SAMPLES for Analysis
- j. REMEDIAL ACTION
- k. Forecast of likely effect of pollution
- l. Names of those informed other than addressees
- m. Any other relevant information including quantity recovered
- n. PROGRESS of the OPERATION

3.6 PREPARING OPERATIONS ACCOUNTING AND FINANCIAL REPORTS

This will be the responsibility of the Crisis Manager. He will prepare and manage two budgets as follows:

- a. Capital Budget for the purchase of major equipment
- b. Operational Budget for logistics

He will work according to the defined Authorities and Procedures to operate these accounts and will advise the committee whether money is available when needed.

During procurement, he will, on the advice of the Operation Managers of the oil companies obtain quotation for these equipment and mobilize resources from all concerned agencies to procure them.

3.7 PREPARING RELEASES FOR PUBLIC AND PRESS CONFERENCES

This will be the responsibility of the Government Agency Liaison Adviser as under 3.1.d above, and in collaboration with the overall commander.

3.8. BRIEFING LOCAL AND GOVERNMENT OFFICIALS

The Overall Commander, having contacted the various authorities at the start of the operation as under 1.2 above, will now brief the same on the present progress.

4.0 TERMINATION OF OPERATIONS

4.1 DECIDING FINAL OPTIMAL LEVEL OF BEACH CLEAN-UP

Chemical specification limits to call off clean-up operations

C. DATA DIRECTORY

1.0 COASTAL FACILITIES AND SHORELINE RESOURCES: ACCESS -ROADS -TELEPHONE

1.1 COASTAL FACILITIES AND SHORELINE RESOURCES

These include all facilities (infrastructural and super-structural) and resources (Natural and otherwise) situated in less than 1 mile proximity to the sea.

Prominent amongst these are hotels, beaches, villages, forests and mangroves, plantations and animal life.

1.1.1Hotels

Current statistics record 134 supplementary means of accommodation in the form of hotels and guest houses in the country, 80% of which cater mainly for beach related tourism. The total bed capacity of these establishments is 2,260 and the average occupancy rate over the period 1988 - 1992 was 30% accounting for 670 bed spaces. About 70% of the total bed capacity (1 582 beds) are occupied during the peak season (March - April) and 15% (339) in the off seasons (July - September).

Average annual expenditure on tourism during the period 1988 - 1992 was 834.54 million for the same period. Hotels and guest houses form our integral part of the country's tourism industry which employs 7,000 indigenes. With the International Labour Organisation estimation that each employee in a developing country supports about 10 dependents it can be inferred that about 70,000 Sierra Leoneans depend on tourism.

In view of the fact that 90% of our hotel/guest house occupants are international tourists who reside mainly in the beach resorts, it can safely be deduced that any serious incident of oil spillage if not promptly and effectively averted will cost the country 90% of the figures stated above.

A map and chart showing the various hotel sites along the coast are supplied in the appendix.

1.1.2 Beaches

The coast of Freetown and the Peninsula areas comprise a total of 40 km of beaches ranging from the silvery white fine-grained sand at Lumley to the golden coarse-pined sand at John Obey. These beaches border on the blue and calm Atlantic Ocean. The beaches, sea and lush vegetative canopy forming the background, attract international tourists and the local population to various kinds of sport including swimming, bathing, fishing, windsurfing, yachting, hobbiecat, sailboat, pedalboat, canoeing and sunbathing.

During the tourist season (October - May)) roughly 7,000 international tourists frequent the Lumley beach 15 km from the heart of Freetown and approximately 14,000 enjoy various sports on peninsula beaches. The Lumley beach attracts a huge number of the Freetown population during holidays and sunny weekends. Estimating that a total of 400,000 Sierra Leonean nationals visit the beach during the various holidays and weekends at Lumley, and

that roughly another 100,000 go to the peninsula beaches the total beach density usage per annum can be estimated at 521,000 including international tourists. See appendix for map and charts.

1.1.3. Coastal Villages

There are 17 important villages along the coast of the Freetown Peninsular consisting of roughly 102,000 inhabitants. With the exception of Aberdeen and Lumley where the working population consists, of mainly commuters who work in various offices in the city, the rest of the other villages are predominantly fishing villages. Therefore the percentage of the Peninsular population which constitute Misanal fishermen can be estimated as 75%. Hence roughly 75,000 inhabitants in the Peninsular area stand to be adversely affected in any major incident of oil spillage.

1.1.4. Vegetation and Animal Life

The Freetown Peninsula is covered by forest vegetation known as the Western Area Forest. The forest trees rise into a high canopy, some in excess of 150ff dominated by mahogany, fig and buttress silk cotton trees. Easily observed in the forest walkaways are primates like chimpanzees and large troops of monkeys of different species including Gamesome, Diana and Red Columbus. Also in the Western Area Forest are large numbers of bird species. The birds include blue, grey and violet plantain eaters Veneaux Tauraco and several species of hornbill. Butterflies are in fact the commonest. Many of the butterflies are brilliantly coloured, large and fast flying and they include the Papillionade, Chanaxes, Danaidae and Piariadae. Among the 2,400 species of butterflies in Africa, about 1,000 species are in West Africa of which the largest and most beautiful have been identified in Sierra Leone and Western Area Forest is one of their main habitats. Most of our international tourists who are attracted by the beaches also use the Western Area Forest for various activities like trekking, bird-watching and wild life viewing in general. Mangroves which are important breeding grounds for fish are found intermittently along the stretch of the coast. Any incident of oil spill into the mangrove vegetation will therefore be poisonous for the fish and this will lead to scarcity of fish within our territorial waters.

Access Road.

Adequate road network is available in the Freetown Peninsula and its environs. The main access road round the peninsula runs from Lumleiy through York to Waterloo. It measures approximately 60km- and consists mainly of ough lateritic gravel which is poorly maintained and can only permit a maximum speed limit of 20km and includes the Waterloo - Freetown highway.

1.3. TELEPHONES

There is presently no reliable telephone link between Freetown and any of the tourist resorts along the Peninsula. The only effective communication network operates up to Lumley and the hotels in the Aberdeen area. The Oil Spill Contingency Planning Committee will need to

establish communication link among the operating offices to avoid late action in time of crisis. The use of VHF is recommended.

2.0. RISK LOCATIONS

Important focal points of perceived risks are in the forms below:

- i. INSTALLATION
- ii. KISSY OIL TERMINAL
- iii. NPA POWER STATION
- iv. DELIVERY POINTS OF OIL ALONG THE BAKRU RIVER

A map and a chart illustrating the locations of these areas are attached in the appendix.

3. METEOROLOGICAL DATA

The Meteorological Department has 11 (eleven) synoptic stations almost evenly spaced throughout the country with full time observers who give 3-hourly reports to the Freetown co-ordinating office and the Lungi forecasting office.

The Lungi and Freetown synoptic stations are the ones that however cover the contingency plan for the Freetown office.

For a complete coverage of this zone, it is however proposed for the inclusion in this plan the setting up of two new stations at Makuma (latitude 8 09', longitude 13 087) to monitor the other end of Freetown zone: See map enclosed. (4 x 8)

The Sierra Leone Coast is on the western side of the country and extends from latitude 9 16', longitude 13 6' to latitude 6 58'. longitude 12 3'W from Makuma to Sulima respectively. The "Freetown Zone" only covers about two fifth (2/5) of this region starting from latitude 9 16', longitude 13 16', to latitude 8 09, longitude 13 08', a distance of about 275 km.

The surface wind is predominantly North-Easterly during the Hamattan season (December to February) and South-Westerly for the remaining seasons of pre monsoon and post monsoon.

The average wind speed as recorded by Freetown and Lungi are:

	J	F	M	A	M	J	J	A	S	O	N	D
FREETOWN	6	6	6	7	6	5	5	5	5	5	5	5
LUNGI	6	7	7	7	7	6	6	6	6	5	5	5

The winds are generally strong along the Coastal areas due to the open sea but become progressively weak or slightly variable inland. See maps 6 & 7 and the wind rose for Lungi (7).

The mountain barriers around the Freetown Coast however intensify the wind velocity. Thus if a violent thunder storm moves in the North-Easterly direction it will definitely affect the Freetown/Lungi areas: See charts 1 & 2.

The maximum wind velocities expected along the North-Eastern direction is about 50-60 knots while the South-Eastern direction is about 20 - 30 knots.

The variation of wind direction and percentage period of duration is as follows:

Months	J	F	M	A	M	J	J	A	S	O	N	D
F/town: Aver. Direct.	E	W	W	W	W	W	W	W	W	W	W	W
F/town: Hr Durat.	37	32	45	48	37	21	25	31	31	32	28	37
Lungi: Aver. Direct.	W	W	W	W	W	W	SW	W	SW	W	W	W
Lungi: Hr. Durat.	38	48	60	52	40	22	27	36	30	32	33	26

For extra-ordinary number of days of squalls in different months of the years 1970-1980. See 3i3 - B7, where June recorded up to 10 squalls at Lungi.

The variation of visibility with respect to time of the day and month of the year are given on tables 3A - AS for Freetown and 3B - B9 for Lungi: The lowest expected is during December to January between 06 to 09 and 15 to 18 hours.

The sky is generally clear during the months of December to March, while cloudy periods extend from May to November with the highest coverage in July and August.

See tables 3A - A5 and 3B - B5 for the Freetown and Lungi areas respectively. The accompanying sunshine duration is given in tables 3A -A3, 3B - B3 and A13.

Sierra Leone experiences heavy rainfall during the wet season with an average annual rainfall of 3000 MM: where the Freetown area accounts for the highest amount. For the past years, the total rainfall is generally below the expected average, but there have been cases of exceptionally higher daily average for some days in July and August for the past two years. For example-in 1992, rainfall for August 2nd to 10th accounted for more than 80% of the total for the month, while in 1993 rainfall for July 29th to August 5th gave 40% of the total for the two months. See tables 3A - AI, 3B - BI for the actual and expected rainfall for Freetown and Lungi respectively and tables 3A - A7 and B-B8 for the days of highest recorded rainfall for the same and all for actual monthly rainfall for 1961 - 1990.

For the proposed stations see tables 5 and 6 for station requirements

3.1. SURFACE WIND FOR THE PERIOD 1969 - 1983

The main seasons in Sierra Leone are as follows:-

3.1.1 The harmattan season (Dec - Feb)

The predominant wind direction is North Easterly

3.1.2 The premonsoon (April, May., June)

The predominant wind direction is South Westerly

3.1.3 The Monsoon season (July, August, September)

The predominant wind direction is South Westerly

3.1.4 The Post Monsoon Season (October & November)

The predominant wind direction is South Westerly.

3.2. WIND STATISTICS FOR THE PERIOD 1969 - 1983

The analysis for the period show that the highest for each season recorded in the country is as follows:.

3.2.1. The Harmattan season – 090/40 is Easterly direction with a velocity of about 40 knots.

3.2.2. Monsoon season – 090/60 is. South-Easterly direction with velocity of about 60 knots

3.2.3 Winds are generally strong along the coastal areas but they become weak or slightly variable inland. Mountain barriers definitely intensify the wind velocity.

3.2.4 A violent thunderstorm moving from a North Easterly direction affected the Lungv/Freetown area on 21st June 1975, at about 2 am and 3.3.am with accompanying wind of hurricane force (Tropical cyclone or almost of the order of a typhoon). This caused a lot of damage to life and property in these areas

3.3. LOCATION OF THE WND ST.ATIONS AND DETALS OF INSTRUMENTS

STATION	LOCATION	INSTRUMENT HEIGHT	HEIGHT ABOVE M S L
Lungi	LAT 65 37' N LONG 13 12' W	13M	182FT
Daru	LAT 07 59' N LONG 10 52' W	10M	610FT
Kabala	LAT 09 35' N LONG 10 23' W	10M	1457FT
Bonthe	LAT 07 32' N LONG 12 30' W	10M	10FT
Njala	LAT 08 06' N LONG 12 06' W	10M	167FT
Bo	LAT 07 58' N LONG 11 45' W	10M	302FT

3.4. HIGHEST MONTHLY WIND VELOCITIES RECORDED AT THE ABOVE STATION

HARMATTAN SEASON

Lungi	-	040/38	December	1983
Daru	-	060/30	January	1980
		045/30	February	1972
Kabala		090/37	December	1973
Bonthe		090/40	"	"
Njala	-	090/32	"	1978
Bo	-	060/38	January	1979

PREMONSOON SEASON

Lungi	-	050/100	June	1975
Daru	-	090/50	April	1970
Kabala	-	310/60	June	1974
Bonthe	-	060/63	May	1974
Njala	-	090/40	April	1979
		120/40	"	1983
		150/40	May	1980
		140/40	June	1983
Bo	-	090/52	"	1975

MONSOON SEASON

POST.....	MONSOON SEASON			
Lungi	-	120/49		
Daru	-	050/39		
Kabala	-	050/50		
Bonthe	-	120/55		
Njala	-	090/42		
Bo	-	160/60		

Maximum wind velocities expected along the North-east direction is about 20 – 30 knots whilst the South-east direction is about 50 - 60 knots.

VESSELS

Below is a summary of vessels comprising of tankers, barges and tug presently operating within the National Petroleum Company.

1. NAPETCO.....OCEAN TANKER

499 (net registered tonnes)

1000 HF engine power

10 Knots speed

Capable of carrying 900 - 1200 tonnes of oil

It has navigation equipment installed and maintained to international standards.

Here are space and cabins to accommodate equipment and personnel to handle a spill.

However, it is not usually around the Freetown waters since it plies the West Coast periodically.

2. TUG.....NITTY

277 N.R.T.

1500 HP engine power

9 Knots speed

This is a motorised tug having good navigational equipment with a 24 hour radio watch on marine channel 16 VHF.

It has ample space to accommodate personnel and equipment for a spill exercise. This tug is always deployed within the Freetown river and hence can be in readiness to handle a spill within short notice.

It has excellent tow/pulling facilities and also has knots and nozzle installed for manoeuvrability in an emergency.

3. BARGE..... KING JIMMY

300 G.R.T.

350 HF engine power

7 Knots speed

450 Tonnes

143.72 NRT

This is a motorized barge, also with good navigational equipment

4. BARGE BRADFORD

215 N.R.T.

600 M/T capacity

This is a tow barge with no engine, used primarily to carry MY0 and AGO to Kingtom Power Station

It can only be used in case of a spill, with the tug towing it.

5. TWO FLOATING BARGES BELONGING TO NP

5.0. SHORELINE TYPES

The main shoreline types along the Sierra Leone River are listed below:

- a. Southern Shoreline
 1. At the mouth of the river the shore is rocky (Aberdeen Cape) up to Kingtom Power Station.
 2. Between Kingtom Power Station and Kroo Bay the shoreline is muddy
 3. Further inland eastwards it is all muddy up to Pepel on the Southern shore.
- b. Northern Shoreline
It is sandy up to Tagin. Further eastward it is all muddy with mangrove vegetation

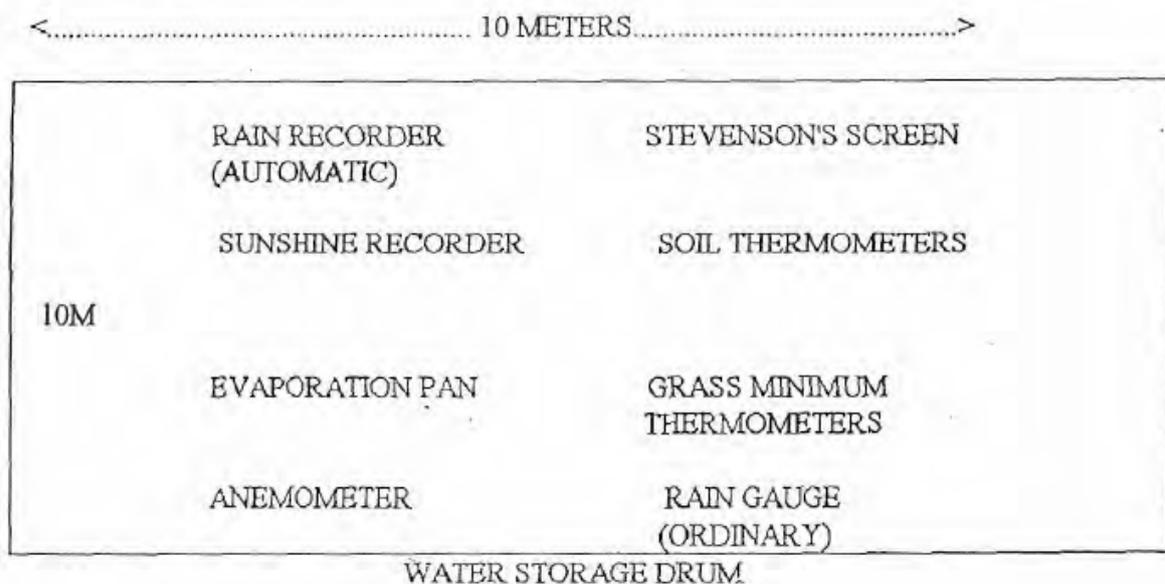
6.0. TYPES OF OIL IMPORTED

According to the present arrangement concerning oil importation, Sierra Leone receives the following:

- JET/KEROSENE
- PREMIUM MOTOR SPIRT
- GAS OIL
- FUEL OIL

These are imported at intervals of 6 week

REQUIREMENTS FOR EACH OF THE PROPOSED METEOROLOGICAL STATIONS (SYNOPTIC STATION FOR THE OIL CONTINGENCY PLAN)



The following instruments are thus needed in the above station:

1. RAW RECORDER (1)
2. EVAROPARATION PAN CONTAINING AN EVAPOIUMETER (1)
3. ANEMOMETER (1)
4. SOIL THERMOMETERS OF VARIOUS GRADES (4)
5. SUNSHINE RECORDER (1)
6. GRASS MINIMUM THERMOMETER (1)
7. GAUGE (1)
8. A STEVENSONS SCREEN CONTAINING
 - DRY BULB THERMOMOTER (1)
 - WET BULB THERMOMETER (1)
 - MAXMUM THERMOMETER (1)
 - MJNIMUM THERMOMETER (1)

To relay the information as and when obtained to the central or co-ordination centre at Lungi and other stations within the country, each proposed site needs a singles side band radio set (SSB set)

METEOROLOGICAL DEPARTMENT

The organizational structure for the proposed Oil Spill Contingency Plan for the monitoring of such spill by the Meteorological Department, T18 Charlotte Street, Freetown
Telephone: 226692226691 is as follows:

PRINCIPAL METEOROLOGIST (1)

METEOROLOGIST (1)

METEOROLOGICAL SUPEF3NTENDENTS (2)

OBSERVERS (10)