



THE NATIONAL OIL SPILL CONTINGENCY PLAN

TRINIDAD AND TOBAGO

MINISTRY OF ENERGY AND ENERGY INDUSTRIES

FEBRUARY 2010

ACKNOWLEDGEMENT

The outline of this plan was developed for the Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean (ARPEL) under the title “How to Develop a National Oil Spill Contingency Plan” in association with the RAC/REMPEITC and COCATRAM.

This outline was modified by the Ministry of Energy and Energy Industries (MEEI) to produce the National Oil Spill Contingency Plan.

TABLE OF CONTENTS

FOREWORD	1
PLAN CUSTODIAN	2
GLOSSARY OF TERMS	3
PREFACE	6
1.1 INTRODUCTION	6
1.2. PURPOSE AND OBJECTIVE	6
1.3. SCOPE	7
1.4. STATEMENT OF AUTHORITY	7
2. RESPONSE MANAGEMENT	8
2.1. LEAD AGENCY	8
2.2. LEAD AGENCY ROLES AND RESPONSIBILITIES	8
2.3. RESPONSE ORGANIZATION	10
2.4. OPERATIONS CENTRE	11
2.5. SUPPORT AGENCIES AND COMPANIES	11
2.6. INTERAGENCY AGREEMENTS	11
3. POLICIES AND PREPAREDNESS	12
3.1. NATIONAL POLICY	12
3.2. LOCAL AND FACILITY PLANS	12
3.3. SAFETY	13
3.4. RISK ASSESSMENT	14
3.5. TRAINING AND EXERCISES	14
3.6. USE OF DISPERSANTS	14
3.7. IN-SITU BURNING	15
3.8. ILLEGAL DISCHARGES	15
3.9 INTERVENTION	15

4. RESPONSE **15**

4.1. ALERTING SYSTEMS	16
4.2. SPILL ASSESSMENT AND SURVEILLANCE	16
4.3. CLEANUP RESPONSE DECISION AND OPERATIONS	16
4.4. CLEANUP AND DISPOSAL OF RECOVERED OIL	17
4.5. RESTORATION OF AFFECTED AREAS	18
4.6. HANDLING OF EXTERNAL RESOURCES	18
4.7. TECHNICAL ADVICE AND RESOURCES FROM OUTSIDE OF THE COUNTRY	19
4.8. PUBLIC RELATIONS	19
4.9. HEALTH AND SAFETY	19

5. REPORTING, COMMUNICATION, LEGAL AND FINANCE **21**

5.1. REPORTING SYSTEMS	21
5.2. VESSEL REPORTING	21
5.3. NOTIFICATION OF THE FLAG STATE	21
5.4. COMMUNICATIONS	21
5.5. COMPENSATION	21
5.6. RECORD KEEPING AND PREPARATION OF CLAIMS	22
5.7. POST-INCIDENT REPORTS	22

]

APPENDIX A – CONTACT LIST	23
APPENDIX B - RESPONSE ORGANIZATION	30
APPENDIX C - SUPPORT ORGANIZATIONS AND ROLES	35
APPENDIX D - ORGANIZATION PLAN CHART	37
APPENDIX E – NOTIFICATION CHARTS/ALERTING SEQUENCE	40
APPENDIX F - LOCALLY AVAILABLE OIL SPILL RESPONSE RESOURCES	45
APPENDIX G - SPILL RESPONSE AND CLEANUP STRATEGIES	49
APPENDIX H - USE OF DISPERSANTS	57
APPENDIX J - SENSITIVE AREAS	60
APPENDIX K - RISK ASSESSMENT	61
APPENDIX L - TRAINING AND EXERCISES	64
APPENDIX M - SALVAGE: DETAILS OF OPERATIONS	67
APPENDIX N - UNIT CONVERSION AND SLICK CALCULATION	69

FOREWORD

Whereas the Government of the Republic of Trinidad and Tobago (GORTT), in keeping with its objective of attaining developed nation status on or before the year 2020, is conscious of the need to preserve and protect our natural environment from the ever-present risk of oil and chemical spills.

And whereas the GORTT recognizes that these risks, to a large degree, can be posed by energy and associated energy operations both on land and offshore, including vessels, platforms, pipelines, ports and oil handling facilities.

The GORTT is mindful of the importance of precautionary measures and prevention in avoiding oil pollution in the first instance, as well as that, in the event of an oil pollution incident, prompt and effective action is essential in order to minimize the damage which may result from such an incident.

The GORTT emphasizes the importance of effective preparation for combating oil pollution incidents and the important role which the oil and shipping industries have in this regard.

The GORTT is committed to ensuring that appropriate measures are taken in accordance with all relevant Local Legislation, Regulations and Standards, all relevant International Conventions acceded to, ratified or entered into force by the GORTT.

The GORTT shall therefore:

1. Assign the responsibility for the prevention, abatement and combating of oil pollution in the country's territorial waters, including its Exclusive Economic Zone and for the cleanup of oil contaminated coastal areas to the Office of Disaster Preparedness and Management (ODPM) as the Lead Agency with the Trinidad and Tobago Coast Guard as the Response Agency;
2. Ensure that this National Oil Spill Contingency Plan set out to provide for a coordinated response action in minimizing the detrimental effects of oil spills on land and at sea is implemented, regularly updated and rehearsed;
3. Appoint Incident Command Staff comprising GORTT personnel, including Incident Commanders who will function as the initiator and coordinator of oil spill contingency planning and response for Trinidad and Tobago;
4. Assign the responsibility for surveillance of the country's territorial waters, including its Exclusive Economic Zone for the timely detection of oil spills and other related emergencies to the Trinidad and Tobago Coast Guard;
5. Mandate the relevant oil, gas, petrochemical, shipping companies to subscribe to recognized and qualified Tier 2 contractors to cover Tier 2 spill response.
6. Ensure the availability of appropriate equipment and training of human resources for efficient response to, and containment, recovery and cleanup of, oil spills in Trinidad and Tobago's marine and terrestrial areas;
7. Encourage and support research in oil spill response, especially in relation to prevention, containment and mitigation methods, including mechanical and chemical means.

Date

The Honourable Senator Martin Joseph
Minister of National Security

PLAN CUSTODIAN

Responsibility for development, updating of and amendments to this plan rests with the Office of Disaster Preparedness and Management.

This Plan is to be kept current whenever changes to key agencies and/or personnel are made and at least reviewed annually. This plan shall also be revised based on experiences from actual incidents, drills and simulation exercises, to take into account any change in the hazard/threat, as well as changes in technology.

No revisions to the Plan can be made unless these are made through the Plan Custodian who will ensure that the revised Plan is distributed to all Plan holders.

For this Feb 2010 version of the Plan, the Custodian is Mr. Marc Rudder, MEEI

The main features of this plan, which is an update of the 1977 Plan, is the abolishment of the Area Controller System, and the adoption of the Tier 2 Base arrangement together with a utilization of the US Coast Guard Incident Command System (ICS).

REVISION DATE	AUTHORITY	CUSTODIAN	REVISION DETAILS
1977	Hugh Hinds	Oswald Adams	Issue
1996	Oswald Adams	Gail Kowlessar-George	Draft. Not finalized
2004	Selwyn Lashley	Gail Kowlessar-George	Draft. Not finalized
2009	Colonel George Robinson	Marc Rudder	Draft

Date

Colonel George Robinson
CEO ODPM

LIST of ACRONYMS

AC	Area Controller
AMPD	Average Most Probable Discharge
ARPEL	Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean
BOSCP	Bilateral Oil Spill Contingency Plan
BpTT	BP Energy Company of Trinidad and Tobago LLC
CAD	Civil Aviation Division
CARIBPOLREP	Caribbean Pollution Report
CARIRI	Caribbean Industrial Research Institute
CCA	Clean Caribbean and Americas
CDA	Chaguaramas Development Authority
CLC	Civil Liability Convention
COCATRAM	Central American Commission for Maritime Transport
COCG	Commanding Officer Coast Guard
DCA	Director of Civil Aviation
DMS	Director of Maritime Services Division
DNRE	Department of Natural Resources and the Environment
EEZ	Exclusive Economic Zone
EI	Environmental Impact
EMA	Environmental Management Authority
EOC	Emergency Operations Centre
ETA	Estimated Time of Arrival
FUND	International Oil Pollution Fund
GC-MS	Gas Chromatograph-Mass Spectroscopy
ICT	Incident Command Team
IMA	Institute of Marine Affairs
IMO	International Maritime Organization
IPIECA	International Petroleum Industry Environmental Conservation Association
MARPOL	International Convention for Prevention of Maritime Pollution from Ships
MEEI	Ministry of Energy and Energy Industries
MFA	Ministry of Foreign Affairs
MOF	Ministry of Finance
MOWT	Ministry of Works and Transport
MSD	Maritime Services Division
MSRC	Marine Spill Response Corporation
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration (US Federal Agency)
NOSCP	National Oil Spill Contingency Plan
NPMC	National Petroleum Marketing Company Limited
ODA	Overseas Development Administration
ODPM	Office of Disaster Preparedness and Management
OPRC	Oil Pollution Preparedness, Response and Cooperation
OSC	On-Scene Commander
OSH Agency	Occupational Safety and Health Agency
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Response Organization
PAH	Polynuclear Aromatic Hydrocarbon
PATT	Port Authority of Trinidad and Tobago

GLOSSARY OF TERMS

PETROTRIN	Petroleum Company of Trinidad and Tobago Ltd
POLREP	Pollution Report
PS	Permanent Secretary
PVC	Polyvinyl Chloride
RAC/REMPEITC	Regional Activity Centre/Regional Marine Pollution Emergency Information and Training Centre
RP	Responsible Party
SAR	Search and Rescue
SCUBA	Self-Contained Underwater Breathing Apparatus
SITREPS	Situation Reports
THA	Tobago House of Assembly
TSPCA	Trinidad and Tobago Society for Prevention of Cruelty to Animals
TTAG	Trinidad and Tobago Air Guard
TTCG	Trinidad and Tobago Coast Guard
TTDF	Trinidad and Tobago Defence Force
TTFS	Trinidad and Tobago Fire Service
TTPS	Trinidad and Tobago Police Service
TTR	Trinidad and Tobago Regiment
UNEP	United Nations Environmental Programme
VHF	Very High Frequency
VOC	Volatile Organic Compounds

DEFINITION OF TERMS

Average Most Probable Discharge	Discharge of the lesser of 50 US barrels or 1% of the volume of the Worst Case Discharge (US Definition)
Dispersants	Specially formulated agents that are sprayed at low dosages on slicks to enhance its natural mixing and biodegradation in surface waters.
Exclusive Economic Zone (EEZ)	In respect of Trinidad and Tobago comprises all areas of sea having as their innermost limits the outermost limits of the territorial sea, and as their outermost limits a line drawn seaward from the baseline from which the territorial sea is measured every point of which is at a distance of two hundred nautical miles from the nearest point of the baselines from which the breadth of the territorial sea is measured
Facility	Something designed, built, installed, etc. to serve a particular function that as a component of operation involves the risk of an oil or chemical spill.
Flash Point	The lowest temperature at which the vapours above a volatile liquid form a combustible mixture with air.
In-situ burning	A controlled ignition of oil, other hydrocarbon products, and oil spill debris at the site of the spill. For offshore spills the burning of the floating oil may occur with or without fire-resistant booms.
Oil	Oil means crude oil, fuel oil, diesel oil and lubricating oil
Operator	
Responsible Party	Responsible Party (The RP of an incident is the person, business, or entity that has been identified as owning the vessel or facility that caused the spill. The term does not imply criminal negligence.)
Ship	Ship means any sea-going vessel of any type whatsoever or any floating craft including pleasure craft, fishing vessels, hydrofoil boats, air-cushion vehicles, submersibles, and fixed or floating platforms.
Territorial Sea	In respect of Trinidad and Tobago comprises those areas of the sea as defined in Section 5 of the Territorial Sea Act, and in respect of any other State as recognized in international law
Tier 1 (T1) Spills	Accidental discharges occurring at or near a facility as a result of routine operations. Impacts are low and in-house response capability is adequate.
Tier 2 (T2) Spills	Medium-sized spills occurring in the vicinity of a facility as a result of a non-routine event. Significant impacts are possible and external (regional) support for adequate spill response is required.
Tier 3 (T3) Spills	Large spills occurring either near or remote from a facility as a result of a non-routine event, and requiring substantial resources and support from national or world-wide spill co-operatives to mitigate effects perceived to be wide-reaching, i.e., of national or international significance.
Tier 2 Base	A contractor with Tier 2 level equipment and personnel with the resources and competence to respond to Tier 2 spills for all operators that are subscribed members of the base within a defined time-frame established by the ODPM or TTCG Unit (at least less than 12-hrs).
Viscosity	A measure of the resistance to flow that a liquid offers when it is subjected to shear stress; higher values indicate thicker, slower-moving materials. For example, gasoline has a lower viscosity than diesel.
Worst Case Discharge	For an onshore facility or port: the largest foreseeable discharge in adverse weather conditions. For a tank vessel: entire tank discharge in adverse weather conditions

PREFACE

1.1 INTRODUCTION

This National Oil Spill Contingency Plan (Short title : NOSCP) has been prepared to relate at all levels to the Caribbean Island Oil Pollution Preparedness Response and Cooperation (OPRC) Plan – hereafter referred to as The Caribbean Plan.

The Caribbean Plan is designed to enhance an individual territory's ability to respond to a spill that is beyond its own capability and thereby establish the principle of mutual assistance.

The principle of Tiered Response applies, whereby:

- **Tier One Spills** are an accidental discharge occurring at or near a facility as a result of routine operations. Impacts are low and in-house response capability is adequate.
- **Tier Two Spills** are medium-sized spills occurring in the vicinity of a facility as a result of a non-routine event. Significant impacts are possible and external (regional) support for adequate spill response is required. Oil and gas operators and facilities and vessels operating in Trinidad and Tobago EEZ for any period for one month or more must subscribe to a dedicated Tier 2 base contractor to handle spills that cannot be handled but in-house Tier 1 capabilities. Tier 2 capability must be able to respond adequately to the spill within 4-6 hours.
- **Tier Three Spills** are large spills occurring either near or remote from a facility as a result of a non-routine event, and requiring substantial resources and support from national or world-wide spill co-operatives to mitigate effects perceived to be wide-reaching, i.e., of national or international significance. Oil and Gas operators that are in the business of oil and gas production and shipping of crude oil will be required to obtain membership with a suitable Tier 3 contractor that can adequately respond to a spill within at least 24- 48 hours.

The plan does not in any way relieve authorities and agencies of their day-to-day operational and environmental responsibilities within the areas of their jurisdiction.

1.2. PURPOSE AND OBJECTIVE

The purpose of the contingency plan is to delineate responsibilities for the operational response to marine emergencies, which could result in oil spills to the marine environment and cause damage to Trinidad and Tobago or its territorial waters and marine life. The plan, where applicable, will also be adopted to respond to marine spills and pollution by hazardous substances other than oil.

The central objective of all countermeasures operations will be to minimize the threat to seabirds, marine life, fisheries, ecologically sensitive areas, tourist-related beaches, water intakes as well as other economically relevant facilities and amenities at risk. Preservation of human life will be paramount to any decision-making process and response.

Procedures will be established that ensure local, national and regional co-operation involving contingency planning, prevention, control and clean up. The National Plan will be the basis and guide for all facility and terminal plans.

1.3. SCOPE

To ensure a timely and effective response to spills, or the threat of an oil spill, this Plan:

- a) Establishes reporting, alerting and assessment systems;
- b) Identifies the chain of command and related responsibilities, including the competent national authority and the national oil spill response organization;
- c) Establishes an incident reporting procedure;
- d) Identifies the size of spill which can be dealt with at the national level;
- e) Identifies high risk areas and likely sources of oil spills;
- f) Identifies environmentally sensitive coastal areas, vulnerable resources at risk and priorities for protection;
- g) Identifies oil spill equipment, logistic support facilities and communication capabilities available within Trinidad and Tobago;
- h) Identifies external sources of expert advice and equipment and establishes procedures for contacting them and assisting in their entry and departure from Trinidad and Tobago;
- i) Identifies Trinidad and Tobago's power of Intervention;
- j) Explains the problems to be faced with an oil spill and appropriate response techniques;
- k) Identifies storage facilities for recovered oil as well as disposal methods;
- l) Establishes a dispersant application policy.
- m) Establishes an in-situ burning policy.

This Plan addresses the geographical area bounded by the Exclusive Economic Zone including the coastal and territorial waters of Trinidad and Tobago. Its response management approach will also be effective for spills of oil or other deleterious petroleum products on land and in any aquatic environment inland.

1.4. STATEMENT OF AUTHORITY

The Ministry of Energy and Energy Industries (MEEI) is authorized to regulate and manage spills caused by licensees according to the Petroleum Act, Chapter 62:01, Part III, 29 (1) (h), (j). Petroleum Regulations, Chapter 62:01, 42 (2) (c), (d), (i), (j), (k), (l), (m); 43 (r), (s)

The Shipping (Marine Pollution) Bill No. 2, 2004, Part VI, Sections 172 – 182, Oil Pollution Preparedness and Response will authorize the Incident Commander/National Controller, originating from the Ministry of Energy and Energy Industries to fulfil the obligations of Trinidad and Tobago to OPRC 1990 to which Trinidad and Tobago is a signatory.

The Environmental Management Act, 2000 authorizes the EMA or the designated environmental officer to enforce the law with management of the environment in accordance with the following sections: 24, 25, 53, 54 and 55.

The Defence Act 1962 will be the mechanism to enforce the law with respect to enforcement by the TTAG, the TTCG and the TTDF in the air, sea and land respectively.

The other laws under which participating agencies function in order to ensure that the land and marine areas are protected against oil pollution are as follows: The Oil Pollution of Territorial Waters Act 1951; The Territorial Sea Act 1969; Archipelagic Waters and Exclusive Economic Zone Act 1986; Harbour Act; Litter Act; Shipping Act; Continental Shelf Act 1969.

2. RESPONSE MANAGEMENT

2.1. LEAD AGENCY

The Lead Agency is the organization in charge of initiating and receiving information directly from the Lead Agencies of other States and Territories. This organization is in charge of communication between public institutions, private interests and international authorities.

In Trinidad and Tobago, the Lead Agency is the Office of Disaster Preparedness and Management (ODPM).

The Incident Command Team (ICT) will be activated when there is a threat of pollution to Trinidad and Tobago. This group will include representatives from the Ministry of Energy & Energy Industries (MEEI), the Environmental Management Authority (EMA), Maritime Service Division of the Ministry of Works and Transport (MSD/MOWT), Trinidad and Tobago Defence Force (TTR, TTCG, TTAG), Tobago House of Assembly (THA) where applicable, and Office of Disaster Preparedness and Management (ODPM). The organization for response will utilize the Incident Command System (ICS).

Other persons and organizations may be co-opted as appropriate and as desired by the ODPM. Its role is primarily to direct the Response Agency, but also includes planning, preparedness, monitoring, response operations and ensuring that other agencies play an appropriate part in support action. The Incident Commander from the lead agency will normally be in overall charge of operations and will chair this Group. The chairman will draw on the expertise of the relevant agencies that participate in a supporting role during a spill incident and will be advised on maritime matters by the MSD and the TTCG. Details of all relevant personnel with office and home telephone numbers are included in Appendix A.

Support, at the operational level, will be provided by the TTCG. Resources will be co-opted as necessary and the beach-cleaning task will involve resources through the ODPM, the Regional Corporations, and the MOWT.

2.2. LEAD AGENCY ROLES AND RESPONSIBILITIES

The Lead Agency is responsible for the following main functions. This plan is developed to utilize the United States Coast Guard (USCG) Incident Command System (ICS) and hence uses the ICS terminology. It is expected that the US ICS Forms would be used during a Tier 2 or 3 response. These forms can be downloaded from the US FEMA website.

Incident Commander

He or she has the overall responsibility for the response operations and must assemble the spill response team (including specialists if required).

- a) The Incident Commander for a Tier 1 incident is the Harbour Master closest to incident, Responsible Party (RP), etc.
- b) The Incident Commander of a Tier 2 incident will utilize the unified command between the TTCG Emergency Response Unit (hereby now referred to as the TTCG Unit), and the Responsible Party (if known).

- c) The Incident Commander of Tier 3 incident will utilize unified command between the Incident Commanders from the ODPM, MEEI, MSD, TTCG Emergency Response Unit and the RP (if known).

Security Officer

The Security Officer maintains site security and assists with evacuation and re-routing of traffic. This function shall be fulfilled by officers from the Trinidad and Tobago Police Service (TTPS) for Tier 2 or 3.

Information Officer

The Information Officer collects and disseminates information and provides data relating to the tanker cargo, ownership, and vessel information. This function shall be fulfilled by officers from the Communications Specialists in the ODPM, MEEI, TTCG and MSD for T2 or T3.

If a spill is large, a Public Affairs Coordinator may be required to serve as the on-site contact for arranging tours and information gathering and dissemination for agencies, the public, and the media.

Liaison Officer

The Liaison Officer coordinates and summons help from support agencies and facilitates and expedites international assistance). The FA and MSD shall fulfil this responsibility for T2 or T3.

Health and Safety Officer

A safety specialist is usually designated to ensure that the spill location and initial containment site are safe for workers, (e.g., H₂S and explosive meter monitoring). This Officer also advises the On-Scene Commander of any special safety requirements and ensures that all work is conducted in a safe manner and that all accidents are properly documented. This function is to be provided by the ODPM for T2 or T3.

Legal Officer

This function advises on insurance and liability concerns. He/she also ensures that adequate analytical sampling is performed, as necessary, and that photographic, video, and written documentation of all spill response activities are conducted.

Operations Section Chief

The Operations Section Chief oversees the administration of Transportation, Storage, Procurement and Finance, and Technical Services (Engineering & Communications), maintaining regular contact with the Incident Commander.

Arranges for appropriate spill response equipment, including:

- a) Containment
- b) Recovery
- c) Disposal
- d) Stock and control provisions

A Cleanup Supervisor may be required to coordinate the spill response activities of a large spill including managing the Response Team. For marine spills, a Marine Cleanup Supervisor and a Shoreline Cleanup Supervisor might be needed. He or she ensures

sufficient personnel and equipment are assigned to land or water based recovery locations and oversees access, site preparation and disposal. These functions shall be fulfilled by the Tier 2 base contractor.

Planning Section Chief

This function coordinates:

- a) Status reports
- b) Environmental monitoring and risk management
- c) Safety
- d) Public Security
- e) Training

This function shall be fulfilled by the ODPM or TTCG Unit.

Environmental Unit

This unit administers environmental affairs, including confirming mandatory regulatory agency notification has been completed and technical environmental expertise is available as required. They also monitor the effectiveness of the spill response. This function shall be fulfilled by the TTCG Unit and the EMA.

An Environmental Advisor assists the Environmental Manager by advising on the ecological impacts of the spilled oil and cleanup methods as well as on environmental regulations.

Logistics Section Chief

The Logistics Section Chief coordinates communications and equipment, personnel and supply movements in a large spill. Activates a mobile command centre and ensures that its operational needs are met. Duties also include:

- a) Spill access
- b) Equipment expediting
- c) Accommodation
- d) Catering
- e) Evacuation
- f) Field Coordination and Communications (summon equipment, maintain field communications equipment, coordinate logistic support)
- g) Arrange for technical and repair services

This function shall be fulfilled by the ODPM and/or TTCG Unit.

Finance Section Chief

Facilitates financial and other resources, arranges payments and controls invoicing. Ensures on-site cost and recovery accounting, and a chronological record is kept of spill control events.

This function shall be fulfilled by the ODPM and TTCG Unit

2.3. RESPONSE ORGANIZATION

The responsibilities of the Response Organization and the Command Teams are briefly defined in Appendix B.

2.4. OPERATIONS CENTRE

The Emergency Operations Centre is the NEOC Facility at the ODPM, in Tacarigua. The Centre will be staffed as necessary and will provide the command and control facility for the entire oil spill operation. An alternate response centre is Oil Spill Response Centre at, Petrotrin, Pointe-a-Pierre Compound. There are other operation centres including bpTT, POS and Galeota Point, and BHP Billiton, POS.

2.5. SUPPORT AGENCIES AND COMPANIES

The support agencies and companies provide technical and advisory assistance to the Lead Agency in the areas of planning, emergency services, infrastructure and social services. (These resources can be drawn from public institutions, private enterprise, oil companies, and NGOs).

International Agencies can also be utilized to provide expert advice, equipment and personnel)

Brief descriptions of the roles of support agencies are included in Appendix C.

2.6. INTERAGENCY AGREEMENTS

Interagency agreements to provide assistance have been made with the following agencies and industries: (List agencies and industries with full details of contacts, address, phone, fax, e-mail, etc. can be found in Appendix A)

Trinidad and Tobago is signatory to the following International Conventions:
MARPOL 73/79, CLC and the FUND.

3. POLICIES AND PREPAREDNESS

3.1. NATIONAL POLICY

In the event of a major oil spill in the marine environment, the following assumptions are made:

- a) The first priority will be safety and preservation of life of persons and personnel.
- b) Early detection mechanism shall be utilized to determine source of a spill and to mount an early response to a spill in the EEZ of Trinidad and Tobago.
- c) In the event of extensive oil impacts, a substantial marine logistical task would be required to organize and sustain the deployment of cleanup personnel and equipment.
- d) The mounting of a labour-intensive and protracted beach cleaning operation would quickly absorb the available labour force so that external reinforcement of equipment and personnel would almost certainly be required as a contingency.
- e) It is likely that Trinidad and Tobago will be able to dispose of all of the oily residue and waste within Trinidad and Tobago.

In major spills, National Policy will recognize that at-sea operations will be the priority and shoreline treatment operations will be a contingency. This plan focusses on the provision of equipment and human resources within the country. This plan also recognizes that external aid will be a last resort in the event local capabilities are exhausted or unable to deal with problem at hand.

Smaller amounts of oil resulting from minor incidents should be manageable by local resources when it comes ashore. Oil pollution from illegal discharges that frequently reach the shoreline in the form of tar balls poses a lesser threat. Tar balls are nevertheless a considerable nuisance and should be handled using a local capability.

Due to the proximity of Venezuela and the fact that a threat to one country may pose a threat to another, a good working relationship must be developed between the authorities of the involved countries with each Contingency Plan being held by the other. In the interest of reducing the impacts of a major oil spill that occurs close to a country's territorial borders, a Rapid Response Agreement of equal right of access must be established. Details of the Rapid Response Agreement are included in Section 2.8 of the Caribbean Islands OPRC Plan 2006.

3.2. LOCAL AND FACILITY PLANS

All ships/exploration operations/ports/harbour facilities/terminals/pipelines that transport or handle hydrocarbons or other potentially dangerous substances must submit emergency plans to the MEEL, the TTCG or the MSD, as is applicable. The local plan should be consistent with and be coordinated with other response plans (national and regional). Meetings will be required to review local plan requirements with agencies named above that oversee contingency planning. These agencies will likely ensure that a Plan is compliant.

Prior to approval, local plans must:

- a) Include a minimum level of personnel and equipment
- b) Describe activation of the company's response system
- c) Provide a declaration or copy of insurance certificates

See Appendix M, Preparation of Local and Facility Plans.

MARPOL 73/78 Regulation requires that every oil tanker of 150 tons gross tonnage and above and every other ship other than an oil tanker of 400 tons gross tonnage and above shall carry onboard a shipboard oil pollution emergency plan approved by the Flag State. The plan must be in accordance with guidelines developed by IMO and should include, as a minimum, the following information in the event of an oil pollution incident:

- a) Reporting procedure
- b) List of authorities to be contacted
- c) Detailed description of the action to be taken immediately by persons onboard to reduce or control the discharge of oil
- d) Procedures and point of contact on the ship for coordinating shipboard activities with national and local authorities in combating the pollution

3.3 SAFETY

The first imperative must be spill prevention and measures must be instituted to mitigate the potential for a spill. If a spill incident occurs, safety of life is the highest priority and should never be compromised regardless of the environmental imperative. As a result, the spill responder will be required to assess all spill incidents to determine the best course of action that attempts to minimize as much as possible the environmental concerns but also consideration of the effect of the response on human safety and health, both in the short term a long term. A Site Safety and Health Plan must be prepared and implemented for all responder work sites. Appropriate personal protective equipment (PPE) must be worn by all responders in accordance the potential risks as determined from a risk assessment. All chemicals used must be approved by the MEEI and handled in accordance with the instructions of their corresponding Material Data Safety Sheet (MSDS). Night operations must be avoided unless there is sufficient light to work in safely. More detail information on safety can be sourced from the IPEICA Report Series, Volume 11 "Oil Spill Responder Safety Guide".

3.4. RISK ASSESSMENT

Marine traffic, especially oil tankers, large cruise liners and cargo vessels in transit through coastal waters, present the risk of major oil pollution from collision, fire, explosion and grounding. Lesser, but nevertheless serious, pollution is caused by vessels pumping out their bilges or otherwise illegally discharging oil.

Pipelines, refineries, and oil handling facilities also pose a threat to both marine and inland environments.

Risk scenarios resulting from normal oil industry and shipping operations on, or in the vicinity, of Trinidad and Tobago must be identified. The NOSCP will outline a response capability, in co-operation with industry, to cover these operations. Operators shall perform risk assessments for their operations to determine the type and quantity of equipment required, response measures and limitations. Based on this risk assessment they must also effectively deal with the T1 spill so that the Average Most Probable Discharge (AMPD) has minimal or no impact on the shoreline or marine mammals. Resources at risk as a result of operations must be identified and mechanisms for protection must be outlined.

The Caribbean Plan Chapter 11 expands on the threat throughout the Caribbean Region. The risk of spills in Trinidad and Tobago is summarized in Appendix K according to the

primary activities that could lead to accidental discharges. See also Appendix J for sensitive zones that would have the highest potential impacts from oil.

3.5. TRAINING AND EXERCISES

The TICG Unit will arrange periodic exercises to ensure that reporting, alerting and communication systems function effectively and that those personnel assigned specific tasks under this plan are familiar with them.

The mobilization and deployment of equipment, personnel and materials to ensure availability and performance should be exercised. Additionally training programs for shoreline cleanup personnel and the Control and Command Teams will be developed.

Annual training will be held that includes multiple agencies in Trinidad and Tobago. Exercises with neighbouring countries should be held every two years to test response plans and the coordination of planning and operations. Each operator must conduct at least one major spill drill every two years and a table top exercise annually. Invitations must be sent to the relevant Government agencies to audit or participate in these events as they are available. See Appendix L for more information.

3.6. USE OF DISPERSANTS

The criteria for the use of chemical dispersants in the Caribbean Region are established in the Caribbean Island OPRC Plan Chapter 10 (see also Appendix H).

The MEEI will be responsible for the approval of the use of dispersants in Trinidad and Tobago waters in accordance with the criteria agreed for the Region unless there are special overriding considerations at the time. It must be noted, however, that for chemical dispersants to be effective, they must be applied on fresh oil in order to maximize the limited window of opportunity for their use – often within 24-48 hours following a spill. This window of opportunity may be expanded in some cases to 72-96 hours depending on the oil type and dispersant to be used. Dispersants must not be used in sensitive areas as determined by the EMA or the Fisheries Division.

It is further emphasized that only licensed and approved dispersants are permitted. This does not include commercial detergents -- which must never be applied. As an added feature, for approved dispersants, testing must be done by each operator to show that their dispersants can function adequately within the environments and oils on which it would likely be utilized. This must be determined by small-scale real-life exercises.

3.7. IN-SITU BURNING

Criteria for in-situ burning in the Caribbean Region are established in the Caribbean Island OPRC Plan Chapter 10.

The TTFS and the EMA will be responsible for the approval of in-situ burning in Trinidad and Tobago waters in accordance with the criteria agreed for the Region unless there are special overriding considerations at the time. It must be noted, however, that for in-situ burning to be safe and effective, it must occur on fresh oil in order to maximize the limited window of opportunity – often within 24-48 hours following a spill. Safety concerns with regard to the fire and smoke plume must also be considered, and must not occur closer than 12 miles from any adjacent Island State or Territory.

It is further emphasized that only approved equipment comprised of fire-resistant booms and igniters are permitted.

3.8. ILLEGAL DISCHARGES

If an illegal discharge takes place within a port area of Trinidad and Tobago, the Harbour Master will advise the Director of Maritime Services (DMS) who will consider whether prosecution action is appropriate under the International Convention for Prevention of Pollution from Ships, MARPOL 73/78, and local laws and regulations.

If a foreign ship discharges oil while passing through the territorial waters of Trinidad and Tobago, the TTCG will advise the MSD who will report the incident to the Flag State of the vessel concerned along with any photographs or evidence and request that the matter be investigated further.

The Institute of Marine Affairs (IMA) and CARIRI will provide sampling, GC-MS analysis, PAH analysis and biological sampling in order to determine the source of all spills as deemed necessary by the Lead Agency or the EMA. The sampling will be done in accordance with the sampling procedures established by the IMA called the "Oil Spill Sampling Manual" published in January 2004.

3.9. INTERVENTION

The DMS will monitor all actions by a damaged vessel, will carefully assess any salvage agreement between the master of the Vessel and any Salvage Company, and will be prepared at all times to intervene under the proposed Shipping (Marine Pollution) Act (presently a Bill). The DMS can use this power to give direction when:

- a) An accident has occurred to or in a ship;
- b) In the opinion DMS, action is urgently required to prevent or reduce oil pollution or the risk of oil pollution on a large scale to Trinidad and Tobago or in the waters thereof.

Directions in this respect will relate to either the ship or its cargo and should preferably be in writing. Once action is taken, the DMS can arrange for other persons to act on his/her behalf. Further details on Intervention are in the Caribbean Island OPRC Plan.

4. RESPONSE

4.1. ALERTING SYSTEMS

Following notification, the Incident Commander will activate the Emergency Operations Centre and the personnel designated to staff the Centre positions should report for duty. Once the significance of the incident has been confirmed, the ODPM will activate the NOSCP. The Incident Commander who has overall responsibility for implementation of the Plan will also contact external agencies such as the CCA and others as appropriate. The International Maritime Organization (IMO) Regional Consultants in Curacao will also be informed as necessary in accordance with the Caribbean Island OPRC Plan. See Appendix E for the spill notification/alerting sequence. See Appendix D for the Roles and Assignments in ICS and Appendix O for the ICS Form 203 for the filling out of personnel for ICS functions.

4.2. SPILL ASSESSMENT AND SURVEILLANCE

Initial confirmation will be made by the TTCG using information gained by observation by satellite, aircraft and surface vessel and an assessment as to the threat to Trinidad and Tobago will be made by the TTCG Unit who will report directly to the ODPM.

The TTCG Unit will arrange for surveillance of the oil slick and, by use of meteorological (provided by the Metrological Office) and hydrographic data, predict its probable movement.

If the assessment shows that another state is likely to be threatened, the MFA or the ODPM will inform that state.

For routine surveillance, all pilots of aircraft and masters of ships and vessels should be instructed by the Civil Aviation Division (CAD) and MSD respectively to report any sightings of oil in the sea for immediate onward transmission to the ODPM and the TTCG Unit.

Instruction on aerial surveillance is included in the Caribbean Island OPRC Plan.

4.3. CLEANUP RESPONSE DECISION AND OPERATIONS

The Incident Command Team (ICT) will meet under the Chairmanship of the ODPM when summoned. It will implement the National Plan and will also consider the following matters:

- a) Mobilize personnel, equipment and materials from internal and, if necessary, external resources.
- b) The desirability of engaging external expertise to advise on oil spill cleanup, and the related measures needed to deploy external resources into and within the territory;
- c) The possible prevention or reduction of outflow of oil at source;
- d) If marine or coastal resources are threatened, whether it is practicable to mount any at-sea response, with or without external aid, and whether sensitive shoreline areas need to be protected by the deployment of booms;
- e) If beaches have been, or are likely to be affected, determine cleanup priorities and direct resources accordingly;

To assist in making these decisions, Appendix J indicates environmentally sensitive areas as the priority areas for cleanup. Appendix F lists locally available resources. It is expected that equipment from local oil production companies will be made available (unless

required for tanker operations on the basis that it is returned as supplied). Appendix G gives spill response and cleanup strategies.

4.4. CLEANUP AND DISPOSAL OF RECOVERED OIL

Clean up and disposal will be dependent on a number of factors, for example, by the characteristics of the environment (e.g. sandy beach, rocky beach, estuary, mangrove, recreational facilities); by species; by accessibility; by type and volume of spilt material; by equipment available and by human resource availability.

The philosophy that will be adopted is waste hierarchy where the following obtains:

Reduction > Reuse > Recovery > Refuse

That is, waste reduction is the most desirable option while Refuse (disposal) is the least desirable option. Oil and water mixtures have the option of treatment re-processing, separation and emulsion breaking or a combination of treatment methods. Oil mixed with sediment has the option of treatment by re-processing, stabilization, bioremediation, sediment washing, landfill (for the sediment) and thermal treatment. Oil and organic debris have the option of treatment by stabilization, bioremediation, and thermal treatment. Oil contaminated PPE/equipment have the option of treatment by landfill or thermal treatment. The EMA will be the ultimate authority in determination of the fate of all waste.

The cleanup will be conducted by workers mobilized by the Ministry of Local Government. Appeals may be made for volunteer groups to assist from qualified and recognized NGO's. Tarred sand will be removed with appropriate equipment supplied by the Ministry of Local Government, the Solid Waste Management Company Limited (SWMCOL), or Works and Transport (MOWT) or contractors and transported to a designated disposal site e.g. Kaizen Environmental remediation site at La Brea where bioremediation will be performed. Any liquid oil recovered will have to be placed in containers and forwarded to Petrotrin waste oil collection system.

The Ministry of Local Government, through the Regional and Borough Corporations, will ensure that waste is segregated into solid, liquids and miscellaneous. These waste streams will be tagged and disposed of by type e.g. sand for fill material or land-farming, Used personal protective equipment (PPE) for incineration, liquids for reprocessing at Petrotrin's Refinery (via Oil Mop) and garbage for land-fills at Beetham or Forres Park. SWMCOL will be the lead state agency to the removal, handling and disposal of solid waste.

Concerning oiled wildlife rehabilitation, recovery and interment, the following system will be followed:

- Oiled wildlife shall be designated for rehabilitation by the Wildlife Section of the Forestry Division
- All oiled wildlife designated for rehabilitation shall be sent for treatment to a registered rehabilitation centre. The only registered centre in Trinidad and Tobago is the Wildlife Orphanage and Rehabilitation Centre (WORC). See Appendix A for their contact details.

4.5. RESTORATION OF AFFECTED AREAS

Once cleanup operations are completed, it may be necessary to restore affected areas. The degree of restoration will be determined by the EMA in consultation with support agencies. In the event the spill is from a vessel, the International Tanker Owners Pollution Federation (ITOPF), the P&I Club of the spilling vessel and the IOPCF must be engaged at an early stage to ensure that restoration plans are in keeping with the IOPCF Guidelines.

Consideration will be given, as necessary to replacing contaminated beach sand, replanting mangrove stands, marsh and sea grasses, and restocking aqua-cultural projects.

In areas identified as having high environmental sensitivity, consideration will be given to establishing a monitoring program to determine the long-term effects on flora and fauna.

An operation will be terminated when it becomes ineffective or when the desired level of cleanup has been achieved.

The Incident Commander will therefore:

- Liaise with all interested parties regarding the conduct of the operation and the level of cleanliness appropriate to each location.
- Stand down equipment and order its removal to an appropriate location for cleaning and maintenance.
- Ensure that temporary storage sites are restored and other work areas are tidied up.

On completion of the foregoing, through utilisation of the relevant Section Chief, he will:

- Ensure all relevant documentation completed.
- Prepare final information bulletin.
- Ensure that consumed materials are reordered and that damaged equipment is repaired or replaced.
- Consolidate costs; regularize accounting procedures; prepare financial report.
- Prepare a formal detailed report (to include time and date of termination).
- Address claims for cleanup costs and pollution damage

Oiled wildlife rehabilitation will be coordinated by an established and recognized registered NGO, e.g. Wildlife Orphanage and Rehabilitation Centre (WORC) (see Service Contact List in Appendix A).

4.6. HANDLING OF EXTERNAL RESOURCES

The handling of external reinforcements of personnel and equipment will inevitably impose considerable strain on Trinidad and Tobago's internal arrangements and the whole subject will form the basis of a separate detailed plan.

However, the following salient points deserve mention here:

- a) Aircraft likely to be deployed are Sikorsky 276A or Eurocopter BO-105 (National Helicopters Fleet) or AgustaWestland AW139 (TTAG).
- b) Aircraft usage of airports at Piarco and Crown Point will certainly be required for landing and unloading of certain aircraft and, for fuelling by all aircraft;
- c) Availability and deployment of marine crafts;

- d) Seaport docking and cargo handling facilities and, where necessary, water transport;
- e) Immigration, Health and Customs arrangements;
- f) Food, accommodation, medical and public health services.

4.7. TECHNICAL ADVICE AND RESOURCES FROM OUTSIDE OF THE COUNTRY

In the event of a spill being determined to be beyond the resources of the Region and recognizing the need for speedy deployment of reinforcements, the following reporting procedures have been established:

(a) Report details direct to ODPM and TTCG Unit

(b) ODPM and/or TTCG Unit will then

(i) Contact the relevant operator to engage the services of their Tier 3 equipment provider (e.g. CCA) to provide the necessary equipment. In the event that the spill cannot be assigned to a responsible party, the national oil company, Petrotrin will be required to contact their Tier 3 provider to assist, under their direction, at the expense of the MEEI, with the necessary equipment and technical advice.

(ii) Depending on that advice, approach with a request for third party access to cleanup facilities, trained personnel and air deployment using dedicated aircraft.

(iii) If the oil spill is from a damaged tanker all 'reasonable' costs incurred in the cleanup will be reimbursed by the Civil Liability Convention (CLC) and the International Oil Pollution Compensation Fund.

Appendix A has a list of international service providers who may be useful in the event of a spill or prior to a spill.

4.8. PUBLIC RELATIONS

Effective public relations are an integral part of any oil spill cleanup operation. In the event of spillage, the COCCG will make arrangements for an experienced public relations officer to disseminate pertinent information to the public and the media to ensure that those who need to know have a full and timely appreciation of the incident and of the actions taken and progress made during the response.

4.9. HEALTH AND SAFETY

Personnel health and safety are prime considerations during an incident response when safety issues can be more complex than those during regular industry duties. As an example, an oil spill recovery on a watercourse involves boat operations where personnel can potentially be exposed to toxic and flammable hazards.

Contingency plans must state the health and safety precautions and any company specific procedures. This includes the need to identify information and procedures on:

- a) Toxicology
- b) Fire and explosion hazards / risk
- c) Operations safety guidelines
- d) Personal protective equipment
- e) Site security
- f) Personnel safety responsibilities

The TTCG Unit will provide direction with respect to the safety measures and use of suitable personal protective equipment for the different component tasks of a response

operation. Companies are expected to follow the health and safety requirements of the TTCG Unit.

5. REPORTING, COMMUNICATION, LEGAL AND FINANCE

5.1. REPORTING SYSTEMS

Upon notification of an oil spill, the TICG, which is usually the initial contact point, shall immediately notify the Lead Agency, who will in turn alert relevant support agencies. The format for the subsequent more detailed follow-up report - CARIBPOLREP- is contained in the Caribbean OPRC Plan.

Reporting is a mandatory requirement under international conventions (see below) with similar requirements also reflected in national regulations.

5.2. VESSEL REPORTING

Ship Masters

Masters or other persons in charge of vessels shall report, without delay, any sightings of oil on the surface of the water to the nearest coastal Island State or Territory as required by Article 4, Oil Pollution Reporting Procedures, Section (10) (a) of the International Convention on Oil Pollution Preparedness Response and Co-operation, 1990 (OPRC).

Ship Owner

Most ships masters are obliged by an applicable regulation (under the law of an Island State or Territory, derived from international conventions to which the government is Party) to notify the nearest State or Territory of a marine pollution emergency that has arisen. Normally this obligation will fall upon the master of the ship, but if the ship has been abandoned, or if the master's report is incomplete, then the obligation on the ship owner to make a report may arise. The obligation to report, which parties to MARPOL 73/78 undertake to implement in their internal law for ships registered in their territory, is contained in Protocol I of that Convention.

5.3. NOTIFICATION OF THE FLAG STATE

Under article 5(3) of MARPOL 73/78, the flag State is entitled to receive notification if any other State party denies the ship entry to its ports or offshore terminals or takes any action against the ship for the reason that it does not comply with MARPOL 73/78.

Under article 6 of MARPOL 73/78, the flag State must cooperate with other Parties in the detection of violations and the enforcement of the provisions of the Convention; if presented with evidence of a violation, the flag State must investigate the matter and, if satisfied that there is sufficient available evidence for proceedings to be brought for a violation, it must instigate such proceedings.

5.4. COMMUNICATIONS

In the event of an oil spill, the ODPM will be the Co-ordination Centre. All information from the site of the spill and impacted areas will be fed into the communication system of the ODPM by ship-to-shore/shore-to-ship VHF. If the spill reaches the coastline, a field site would be set up to feed information into the Control Centre. Each Strike Team will be responsible for coordinating information to be fed into the Centre.

5.5. COMPENSATION

This gives force to the 1992 Protocol of the International Convention and Civil Liability for Oil Pollution damage (the "CLC") and makes the owner of a ship carrying cargo of persistent oil in bulk strictly liable for any pollution damage in the area of Trinidad and Tobago including the territorial waters, seabed, shores, beaches and ecology thereof.

The liability extends to post-spillage prevention and cleanup costs. Trinidad and Tobago does not have to prove that the ship was in any way at fault in causing the pollution.

In cases where the costs of cleanup exceed the limited liability of the owner of the ship, Trinidad and Tobago may make a claim to the International Oil Pollution Compensation Fund in accordance with the 1992 Protocol of the Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage.

It should be noted that none of these compensation schemes applies to illegal discharges. However, applicable local legislation may be in place to address illegal discharges.

Further details on cost recovery schemes are presented in Chapter 8 of the Caribbean Plan.

5.6. RECORD KEEPING AND PREPARATION OF CLAIMS

In order that financial claims may be processed with minimum delay, it is essential that accurate records are maintained for each cleanup location and include details of all actions taken; the reason for such action; personnel and equipment deployed; and consumable materials used. All meetings must be minuted and receipts of purchases preserved for future reference and for preparation of claims. The ODPM and TTCG will have overall responsibility for ensuring that these very important records are maintained.

5.7. POST-INCIDENT REPORTS

Following resolution of the oil spill and termination of the response for a particular incident, the support agencies involved will be responsible for submission of an After Action Report to the Incident Commander not later than three days following closing of the response. The Incident Commander and the Response Agency shall be jointly responsible for submission of a comprehensive After Action Report, incorporating reports from all responsible agencies within 7 days of closing the particular response.

Subsequently, the ODPM will submit the final report to the Permanent Secretary/Minister, for their approval.

APPENDIX A – CONTACT LIST

ORGANISATION	POSITION	ADDRESS	OFFICE	CELL	FAX	EMAIL
Airports Authority		Airports Administration Centre Caroni North Bank Road Piarco	669-5311			aatt@tntairports.com operations@tntairports.com
Caribbean Industrial Research Institute (CARIRI)	Director	UWI Campus St Augustine	662-7161-3 645-2355		662-7177	cariri@trinidad.net
Chaguaramas Dev't Authority (CDA)		Airways Road, Chaguaramas	634-4364/ 4227/4349/4312			
Civil Aviation Division		Piarco	669-4302			
Coast Guard (Response Agency)		Staubles Bay Base Chaguaramas	634-4235/ 4434/4440		634-4944	
Customs & Excise Division		Abercromby St. & Independence Square Nicholas Court	625-3311-9			
Environmental Management Authority (Lead Agency) (EMA)	EPO11	#2 Dumfries Road, La Romain 8 Elizabeth St. St. Clair	697-7088 Ext. 3262	680 – 9588	697-0309 628-9122	rramoutar@ema.co.tt
	Assistant Manager, Compliance		697-7088 Ext 3257			
	Manager Technical Service	9 Elizabeth St., St. Clair	628 – 8042			
Fire Services Emergency	Emergency		990			
		San Fernando	652-2675/6/7			
		Petrotrin	658-4200 Ext. 2580			
		Wrightson Rd, POS	625-9049/51 625-2671		625-2481	
Immigration Division		Piarco Airport, Piarco	669-5895 (24-hr hotline)			
Institute of Marine Affairs (IMA)	Director	Hilltop Lane, Chaguaramas, P.O. Box 3160, Carenage	634-4291-4		634-4433	director@ima.gov.tt
Ministry of Agriculture, Land and Marine Resources	Director, Fisheries	Fisheries Division Cipriani Boulevard Port-of –Spain	623-8525		623-8542	
Ministry of Energy and EI	Director DRM	IWT, 1 Wrightson Road, POS	623-6708 Ext 2607			oadams@energy.gov.tt
	Head HSE/ Measurement Section	Maska Building, South Trunk Road La Romain	697-7864 Ext. 227		697-7013	iramdahin@energy.gov.tt
	Permanent Secretary	IWT, 1 Wrightson Road, POS	623-6708			lmayers@energy.gov.tt

ORGANISATION	POSITION	ADDRESS	OFFICE	CELL	FAX	EMAIL
Ministry of Energy and EI (cont'd)	Engineers	Maska Building, South Trunk Road La Romain	697-1484/1275 Ext. 228/229		697-7013	mrudder@energy.gov.tt kseecharan@energy.gov.tt
Ministry of Foreign Affairs	Permanent Secretary	1 Queen's Park West, Knowlsey Building	623-4116/20 Ext. 2203/2205		627-0571	
	Legal, Marine and Energy		623-4116/20 Ext. 2228		624-4220	
Ministry of Health	Chief Health Inspector (Ag.)	Park and Edward Streets	627-0010/12/32/35			
Ministry of Planning, Housing & the Environment	Director, Environmental Planning	16-18 Sackville Street POS	635-6658 627-5272		625-7003	
	Deputy Environmental Manager	16-18 Sackville Street	635-6658 627-5272		625-7003	mgowrie@pubutilenv.gov.tt
Ministry of Works & Transport Maritime Services Division	Director	48-50 Sackville St POS	625-3218 625-7004			msd@mowt.gov.tt
NEMA Tobago (TEMA)	CEO	Fairfield Complex www.tema365.com	660-7489/ 639-3421, Ext. 244			
Office of Disaster Preparedness & Management (ODPM)	CEO	4A Orange Grove Road, Trincity, Tacarigua	640-1285/8905		640-8988	info@odpm.gov.tt
Office of the Attorney General	Attorney General	Cabildo Chambers; 23-27 St. Vincent Street; Port of Spain	623-7010/1576 625-8901		625-0470	
OSH Agency	On Duty Inspector	Duncan Street Complex Corner Duncan Street and Independence Square Port-of-Spain	OSHA hotline 623-OSHA (6742)			
Point Lisas Industrial Port Development Company Ltd (PLIPDECO)	President	Plipdeco House Orinoco Drive Pt Lisas	636-2201 2705-7 1336/2779 1888/1335	680-4457	679-2907	
Police	Emergency		999			
Special Anti-Crime Unit of T&T (SUATT)	Operations Officer	El Soccoro/Riverside Plaza	638-6539		675-9227	operations@suatt.gov.tt
Tobago House of Assembly (THA)	Director	Department of National Resources and the Environment Calder Hall Administration Complex	639-3421/ 3876/2113/ 3880/ 4224/ 2146/ 3886			
Tourism Development Company (TDC)	President	Level 1, Maritime Centre, #29 Tenth Avenue, Barataria	675 7034-7		675-7722	
	Public Affairs Manager		675 7034-7		638-7962	info@tdc.co.tt
Trinidad and Tobago Defence Force	Operations Officer or J3	Airways Road Chaguaramas	634-3347			

ORGANISATION	POSITION	ADDRESS	OFFICE	CELL	FAX	EMAIL
Trinidad and Tobago Meteorological Services	Director (Ag.)	Piarco Airport Piarco	669-5465		664-4009	dirmet@tstt.net.tt
	Forecast Office	Old Terminal Building, Piarco	669-4392		664-4727	
Trinidad and Tobago Solid Waste Management Co. Ltd (SWMCOL)	Manager, Environmental Projects	34 Independence Square, Port of Spain	625-6678 625-6680		623-6534	info@swmcol.co.tt
	Executive Chairman		625-6678-80			
Trinidad and Tobago Society for the Prevention of Cruelty to Animals (TSPCA)		189a Tragarete Road 199 Gopaul Circular Dr. Friendship Road P.O.Box 373, Scarborough, Tobago	622-1367 658-3813 639-2567		639-9050	Support@TTSPCA.com

OIL AND GAS COMPANIES CONTACT LIST

ORGANISATION	NAME	POSITION	ADDRESS	OFFICE	CELL	FAX	EMAIL
Atlantic LNG Company of Trinidad and Tobago (Pt. Fortin)	Mr. Headley	HSSE	Pt. Fortin		681-5795		atlanticinfo@atlanticlng.com
BG T&T (Blk 5a, E, 6b, 6d NCMA1 (Blk 13), Central Block)	Orissa Forde	HSSE Advisor	BG House 5 St. Clair Avenue Port of Spain	628-0888	741-0400	622-6520	
BHP Billiton Blk 2c, 3a Galeota Terminal		HSSE Team Leader Operations Manager	Invaders Bay Tower, Invaders Bay, off Audrey Jeffers Highway Port of Spain	821-5158		625-9255	
	Neerupa Latchman	HSE Advisor			7456445		
bpTT LLC East Coast: FL, Imm, Mah, Cassia, Amh, Can, Mango, Chma, Teak, Poui, Samaan, Blk 5(b), Terminal	Tyrone Kalpee	HSSE Manager	5-5A Queen's Park Plaza, Queen's Park West, POS	623-2862 Ext. 5607	686-7078	627-7878	Tyrone.Kalpee@bp.com
	Rachael Mungroo-Ramsamooj	CAER Advisor			468-2037		Rachael.Mungroo-Ramsamooj@bp.com
Canadian Superior Energy Inc. Blk 5c	Roger De Freitas	Country Manager	5 Herbert Street St. Clair, Port of Spain	628-5488		628-3072	rdefreitas@cansup.com
EOG Resources Blk Modified U(b), U(a), 4a, Lower Reverse L, SECC: Ibis, Oilbird, Kisskidee/Banyan/Pelican	Ivan Salick	HSSE Advisor	Briar Place, 10-12 Sweet Briar Road, St. Clair, Port of Spain	822-5768		622-5074	
Kerr McGee TT Offshore Petroleum Ltd. (Blk 3b)	Doug Neese	Incident Commander/ Country Manager	Chamber Building, Columbus Circle, Westmoorings	633-5253	741-9485 281-507- 2721	633-0956	
Lennox Petroleum			21 Princess Margaret St SFDO	657-7205			
Moraven (East Coast)	George M. Nicholas III		Suite 405, Level Four, Long Circular Mall, Long Circular Road, St. James	622-0427		628-3708	mail@moraven.com
National Gas Company (NGC) (Teak, Poui), Land	Antonia Lucky		Orinoco Drive, Point Lisas Industrial Estate, Couva	636-4662 /4680 679-2384		636-4602	info@ngc.co.tt ngc@ngc.co.tt
Neal and Massy Energy Resources Limited	David Isaac		61 Cipero Street, San Fernando	652-8728	680-9434	657-2752	d-isaac@neal-and-massy.com r-ajodha@neal-and-massy.com

OIL AND GAS COMPANIES CONTACT LIST

ORGANISATION	NAME	POSITION	ADDRESS	OFFICE	CELL	FAX	EMAIL
New Horizon (Parrylands Block E)	Mandy Ann Pierre	HSE Leader	P.O. Box 3897 133 Clifton Hill Point Fortin				mandy@oilandgas.com
	Greg Boyles	Managing Director					
Petro-Canada Blk 22, 1a, 1b	Nicole Simon-Thompson	HSSE Advisor		821-7250	471-4694		
Petrotrin Blk 9, Gulf of Paria, Refinery, Land Operations	Valerie Quan-Vie	Manager HSE	Admin. Building, Southern main Road, Point-a-Pierre,	658-0094 658-1315	658-7186	658-0095	Valerie.QuanVie@petrotrin.com
	Shyam Dyal	Head – Corporate HSE		658-3072 658-4200 Ex 2802	684-7539	658-7306	Shyam.Dyal@petrotrin.com
	Francesca Lalla	HSE – Corporate		658-4200	7642990	658-7306	Francesca.Lalla@petrotrin.com
	Patrick Julien	Head – HSE, E&P	Santa Flora		497-4616		Patrick.Julien@petrotrin.com
Primera Oil and Gas Limited	Patrick Acham	CEO	30 Forest Reserve Road	677-7253	678-4229	677 7462	precon@tstt.net.tt
	Timothy Gabriel	Division Manager Exp. & Production		677-7411/2 7252/4413 4478/5061	620-8554		
		EHS Engineer		Ext 2215/2236	765-1327	677-7462	
Plipdeco	Ernest Ashley Taylor	President (Ag)	Plipdeco House Point Lisas	636-4913/7678/2132		679-2907	
Repsol YPF Teak, Poui, Samaan	Enrique Garcia, Mariano Gonzales	Incident Commanders	4 Queen's Park West Port of Spain	623-1770	724-6907	927-2757	
	Ryan Ramjit Maria Legarza Soriaya Baksh- Manwaring,	Manager-HSE Environmental Advisers			7246912 7246788		RRAMJITR@repsolyfp.com SBAKSHM@repsolyfp.com MCLEGARZAL@repsolyfp.com
Shell Trinidad Limited	Giselle Cook	HSSE Advisor	P.O. Bag 51, California, Post Office,	+1 868 6360040		+1 868 6794714	
Ten° Degrees North Energy Ltd		CEO		6775786, 677-4875, 5785, 5756	652-3670 745-7789 358-3043 620-7147		info@ten.co.tt
Trinidad & Tobago National Petroleum Marketing Company Limited (NP)	Avonelle Ferrette	HSE Manager	NP House, National Drive, Sealots P.O. box	625-3531-3 / 625- 1364-8 Ext 260 623-6245 Ext 374	759-4456	627-4028	npmc@trinidad.net
Trinmar (Petrotrin) Gulf of Paria	Garett Manwaring	Head – HSE, Trinmar	Point Fortin		685-4565 481-4021	648-3862	Garret.Manwaring@petrotrin.com

SERVICE ORGANIZATIONS CONTACT LIST						
ORGANISATION	NAME	POSITION	ADDRESS	OFFICE	FAX	EMAIL
Briko Air Service Ltd. (helicopters, crop dusters)			Couva Delivery Centre, Couva PO Box 1148	636-0709	636-1168	briko@tstt.net.tt
Bristow Caribbean Ltd. (helicopters)	Mr. James M. Wilhite	Managing Director	Hangar #4 Piarco International Airport, Piarco	669-8101-7	669-7758	
Hospitals	Community Hospital of SDAs		Tobago	639-4014 660-7444		
	PORT OF SPAIN General Hospital		POS	623-2327 623-2951/2		
	EWMSC		Mt. Hope	645-4673/2640		
	San Fernando General		San Fernando	652-3580 652-3581-6		
	Couva District Hospital					
	Princes Town District Hos.					
	Mayaro District Hospital		Mayaro	630-1258/9		
	Scarborough Regional Hospital		The Fort	639-2551/2		
	Chaguanas Health Facility		Chaguanas	671-0041		
Augustus Long		San Fernando	658-4200 Ext 2336			
Hummingbird Helicopter Services Ltd.			Chootoo Commercial Complex, 1A Chootoo Rd, El Socorro Ext.	675-1234 /3354/9039	674-4031	hummingbird@trinidad.net
Kaizen Environmental (incineration,bioremediation, equipment, personnel)	Doug De Freitas	President	Rajkumar Street, Mission Road, Freeport, Trinidad	299-0009	673-6420	
National Helicopter Services Limited (NHSL)	Captain Nicolas Nothnagel	General Manager	NHSL Heliport, Camden Field PO Bag 685, Couva	679-2628/ 2629/2630	679-2345	noteli@tstt.net.tt
Oil Mop Trinidad Limited (waste oil reprocessing)			PETROTRIN COMPOUND Dispensary Road, Guaracara, Pointe-a-Pierre, Trinidad	658-3340 / 2363 / 7968	658-3346	info@oilmopt.com
Radio Emergency Associated Communications Team: REACT	George Butcher					Gb7800@gmail.com
Tiger Tanks (equipment, storage, response personnel)	Denis Latiff	Managing Director	Lot # 22B La Brea Industrial Development Company (LABIDCO) La Brea, Trinidad	651-1544/0130/ 1460	648-9763	denis.latiff@tigertankstrinidad.com
T. N. Ramnauth Co. Ltd. (equipment, personnel)	Mr. Taradath Ramnauth	Managing Director	#224 Clarke Road. Penal	647-4884/647- 7804	647-4416	tnrcold@hotmail.com
Wildlife Orphanage and Rehabilitation Centre (WORC)	Ms. Detta Buch	Director	http://www.worctrinidad.org/			
Yacht Services Association of Trinidad and Tobago (YSATT)			CrewsInn Hotel & Yachting Centre, P.O. Box 2852, TT Post, Chaguaramas	634-4938	634-2160	info@ysatt.org ysatt@tstt.net.tt

INTERNATIONAL ORGANIZATIONS CONTACT LIST						
ORGANISATION	NAME	POSITION	ADDRESS	OFFICE	FAX	EMAIL
ARPEL - Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean			Javier de Viana 2345 P.O. Box 1006 11200 Montevideo - URUGUAY	(598-2) 410 6993	(598-2) 410 9207	arpel@arpel.org.uy
Clean Caribbean and Americas (CCA)	Mike Gass	Training Manager	2381 Stirling Road, Fort Lauderdale, Florida, 33312, USA	954-983-9880	954-987-3001	staff@cleancaribbean.org
EmergWest Consulting	Mark West		2234 Foothills Court, Abbotsford, BC, Canada V3G 1E1	(604) 785-5256	(604) 855-0134	mark@emergwest.com
Guiria's Coast Guard						
Guiria's National Guard						
IMO Regional Activity Centre/ Regional Marine Pollution Emergency Information and Training Centre –Wider Caribbean (RAC/REMPEITC-Caribe)		Senior Consultant	Fokkerweg 26, Curacao, Netherlands Antilles	5999-461-4012	5999-461-1996	imocr@atgglobal.net
International Group of P&I Club			Peek House, 20 Eastcheap London EC3M 1EB	+44 (0) 20 7929 3544	+ 44 (0) 20 7621 0675	secretariat@internationalgroup.org.uk
International Maritime Organization (IMO)			4 Albert Embankment London SE1 7SR	+44 (0) 20 7735 7611	+44 (0) 20 7587 3210	info@imo.org
International Oil Pollution Compensation Fund (IOPC)			Portland House Bressenden Place London SW1E 5PN U.K.	+44 (0) 20 7592 7100	+44 (0) 20 7592 7111	info@iopcfund.org
International Petroleum Industry Environmental Conservation Association (IPIECA)			5 th Floor, 209-215 Blackfriars Road London SE1 8NL	+44 (0) 20 7633 2388	+44 (0) 20 7633 2389	info@ipieca.org
International Tanker Owners Pollution Federation Ltd. (ITOPF)		Technical Advisor	1 Oliver's Yard, 55 City Road London EC1YHQ	+44 (0) 20 7566 6999 +44 (0) 762 398 4606 (24 -hr emergency number)	+44 (0) 20 7566 6950	central@itopf.com
Oil Spill Response (OSR)			Lower William Street Southampton SO14 5QE United Kingdom	+44 (0)23 8033 1551	+44 (0)23 8033 1972	southampton@oilspillresponse.com
US Coast Guard			Sector San Juan, Puerto Rico	(787) 289-2041	(787) 729-6706	
UN World Conservation Monitoring Centre (WCMC)			219 Huntingdon Road, Cambridge, CB3 0DL	+44 (0)1223 277314	+44 (0)1223 277136	

APPENDIX B - RESPONSE ORGANIZATION

Trinidad and Tobago will not respond to a spill independently of the Responsible Party (RP) unless unknown. Working together with the RP will result in the best response to a spill incident. The organizational structure outlined in this Plan will accommodate the intent of industry where the RP is undertaking an appropriate/best practice response. In the event that the RP is not responding to the spill in a manner as deemed by GORTT in the best interest of Trinidad and Tobago, the GORTT will take control of the response to the spill and recoup all incidental costs from the RP.

General Responsibilities

Responsibility	Agency
Overall Responsibility for implementation of the Plan	ODPM
Coordination of activities with the RP	TTCG Unit
Foreign/Overseas Relations: Contact and liaison with foreign or external agencies and others as appropriate	ODPM, MFA
Activation of the Plan and closing of operations for medium/major incidents.	ODPM, TTCG Unit
Report and make recommendations to the (<u>Permanent Secretary/Minister of Energy</u>), as appropriate.	ODPM, TTCG
Contact and liaison with IMO (regional and headquarters).	ODPM, MSD
Report to Flag State of ship involved in pollution incident	MSD, MFA
Overall charge of response operations.	ODPM
Approval of Dispersants	MEEI
Designate suitable site and agree on safe method of disposal of oily waste, residues and debris by burning, burial or other methods	EMA
Provision of technical equipment e.g Public Transport (PTSC), Ports (PATT), Aviation (CAD, AATT), MTS, Helicopters (National Helicopters)	MOWT
<ul style="list-style-type: none"> • To mitigate the spill by ensuring the conduct effective clean-up operations. • Assist the RP in matters such as arranging for expedited customs/immigration services when bringing resources in from outside the Country. • Assist the RP in exporting these same resources to their home base once the incident is over. 	TTCG Unit

Responsibility	Agency
<ul style="list-style-type: none"> • Staffing Command Teams as appropriate to the degree and scope of the incidents. • Provide surveillance/patrol craft - marine and air. • Assessing the Situation - determining pertinent facts such as: the nature, size locations, probable movement, direction and speed of the spill; resources available; and areas likely to be impacted. • Supervising and monitoring efforts to have Polluter undertake the necessary actions to mitigate the impact and conduct proper environmentally sound clean-up. • Conducting detailed investigation to assess damage. Initiating and managing national mitigation efforts including establishing clean-up priorities and monitoring and control of expenditures. Maintaining up-to-date and accurate flow of information to the <u>MEEI</u>. • Documenting all major actions and all costs and reports associated with the operation. Other aspects (see the Plan). 	TTCG Unit
<ul style="list-style-type: none"> • Provide liaison with sub-agents of (<u>Local Government</u>), administration services, Disaster Committees and volunteers. • Activate, designate and staff with personnel, and manage EOC as appropriate. • Initiate and receive pollution information directly from local sources and other Lead Agencies during incident/operation or simulation exercise. • Provide and coordinate communications networks as necessary for operation EOC/Government/OSC Ship/Shore, etc. • Arrange periodic simulation and training exercises, workshop and seminars as necessary for administrative, technical operational staff and field groups. • Arrange briefing and on-scene visits by (<u>Prime Minister</u>), Officials and Dignitaries. 	ODPM
<ul style="list-style-type: none"> • Assist in investigating incidents. • Work with responders to ensure adequate security of response operations/sites • When needed, provide escort service and/or expertise for movement of equipment 	TTPS

Responsibility	Agency
<ul style="list-style-type: none"> • Provide operational and technical support. • Facilitate speedy handling and entry of personnel equipment and supplies travelling/arriving/departing by sea. • Provide short term storage for equipment and stores required in connection with and operation. • Provide marine craft and personnel as necessary and available. • Collaborate in detention of any vessel involved in a pollution incident. • Prosecute offending vessels/personnel, as appropriate. • Respond to local pollution incidents in ports and harbours. (Arrangement may be made with (fill in, e.g. Conservation and Fisheries) and others in this regard). 	Port Authorities
<ul style="list-style-type: none"> • Provide technical advice, support, personnel and equipment. • Supervisor of land/shore cleaning and disposal operations with mechanical equipment, etc. 	MOWT
<ul style="list-style-type: none"> • Operational support to the IC • Provide personnel, materials and equipment as necessary and available. 	TTFS
<ul style="list-style-type: none"> • Report sighting of pollution and information on discharge source, if known • Organize surveillance missions to monitor progress of response and behaviour of the spill • Provide logistical support in the event that spraying of dispersant, etc by use of aircraft is required. • Facilitate speedy entry and handling of personnel, equipment and supplies arriving by air. 	CAD, TTAG, SUATT
<ul style="list-style-type: none"> • Provide weather and climate information, bulletins and warnings, analyses and forecasts to IC 	Met Office
<ul style="list-style-type: none"> • Provide advice on general health matters including dangers posed by toxic substances 	MOH, EMA
<ul style="list-style-type: none"> • Legal counsel to IC on operations matters. • Ensure the necessary evidence is properly documented for obtaining reimbursements of response costs, other damages and undertaking further prosecution. • Provide advice on the correlation between laws (national and international) and the Plan, so as to keep the Plan up-to-date and enhance its legal foundation. • Lead negotiations with any involved vessel and cargo owners, insurers and other bodies regarding claims, compensation and indemnity. • Provide advice to victims of pollution damage. • Arrest of offending vessel if necessary, prosecution of owners/personnel. 	MEEI (Legal), Petroleum Pollution Compensation Tribunal, Office of AG. ODPM

Responsibility	Agency
<ul style="list-style-type: none"> • Provide weather and climate information, bulletins and warnings, analyses and forecasts to IC 	Met Office
<ul style="list-style-type: none"> • Provide advice on general health matters including dangers posed by toxic substances 	MOH, EMA
<ul style="list-style-type: none"> • Legal counsel to IC on operations matters. • Ensure the necessary evidence is properly documented for obtaining reimbursements of response costs, other damages and undertaking further prosecution. • Provide advice on the correlation between laws (national and international) and the Plan, so as to keep the Plan up-to-date and enhance its legal foundation. • Lead negotiations with any involved vessel and cargo owners, insurers and other bodies regarding claims, compensation and indemnity. • Provide advice to victims of pollution damage. • Arrest of offending vessel if necessary, prosecution of owners/personnel. 	MEEI (Legal), Petroleum Pollution Compensation Tribunal, Office of AG, ODPM
<ul style="list-style-type: none"> • Advice on all financial aspects of response. • Provide funding for the operation as may be necessary. • Assist in cost accounting, claims and compensation assessment. 	MOF
<ul style="list-style-type: none"> • Collaborate with other agencies and Departments to expedite due entry of equipment required for response. • Assist with the response itself through the participation/involvement of extra agents available to get out-of country response equipment through customs quicker. 	C&E
<ul style="list-style-type: none"> • Collaborate with other agencies and Departments to expedite due entry of personnel required for response. 	Immigration Division
<ul style="list-style-type: none"> • Liaison between IC and owners/operators of resorts and tourism facilities impacted or likely to be impacted by pollution incident. • Collaborate with other agencies/departments assessing priority/sensitivity criteria for response/protection. • Participate and advice in public relation exercises. 	TDC

Responsibility	Agency
<ul style="list-style-type: none"> • Provide technical advice, personnel and response resources as needed, if available. • Collaborate – when possible - with Lead Agency in simulation and training exercise and workshops. • Develop in-house plans that are compatible with the NOSCP subject to approval by the IC • Ensuring that in-house plans are produced for their own operations as well as for operations and activities within their designated areas of operations • Response to all Tier 1 spills within the marine area of operation that can be reasonably handled. • Subscribe to a Tier 2 base contractor as directed by the MEEI or MSD • Subscribe to a Tier 3 base contractor as directed by the MEEI or MSD • Daily surveillance of all high-risk areas with appropriate records within contract or licensed area, as appropriate • Provide sufficient information on the size of a spill to the MEEI and TTCG to make the necessary decision. • Rendering assistance, if necessary, for a Tier III spill • Coordination of the initial response in the event of a reported incident (Tier 1 and 2) • Rendering assistance, if necessary, for a Tier 3 spill • Provision of round the clock contact points • Conducting exercises and drills • Technical assistance with respect to sensitivity mapping, trajectory modelling, remote sensing, video-taping, photography, etc. during an oil spill incident • Development of cooperative and joint ventures for oil spill response as necessary 	<p>Local Oil and Gas Companies, Facility Owners/Operators /Vessel and Shipowners</p>
<ul style="list-style-type: none"> • Establishment of strategically positioned stockpiles of suitable pollution combating equipment and materials; • Rendering assistance, if necessary, for a Tier III spill 	<p>Tier 2 base contractor</p>
<ul style="list-style-type: none"> • The preferable course of action is for the Polluter to undertake all necessary actions approved by the TTCG. • The polluter will in any event be held liable for all costs and damage arising from or connected with a pollution incident. 	<p>RP</p>

Management System Options (TBD) – A Change from the Area Controller System

Option 1: TTCG with Capacity for Tier 2 Response

- Dedicated unit of TTCG (in the ODPM or EMA) for oil spills/emergency response management.
- TTCG to be the repository of Tier 2 equipment positioned strategically around T&T at existing available State land sites and bases with maintenance performed by a suitable contractor or contractors.
- TTCG unit will respond/assist with all Tier 2 spills.
- All operators and other organizations with oil spill risks to contribute in some measure to the funding of acquisition of equipment for the TTCG. However most of cost will be borne by GORTT.
- All operators will handle Tier 1 spills. Tier 1 is to be defined for each operator based on risk assessment which will aid definition of Average Most Probable Discharge and required response capabilities and response time requirements. Neighbouring operators can form mutual aids if necessary to assist each other.
- All Oil and Gas Operators to be "area coordinators" for their licensed areas especially for non-associated operations with the oil spill risks. Areas that may be impacted by their operations outside of the licensed areas must be coordinated with other neighbouring operators.
- The TTCG will respond to all mystery spills or may opt to direct an operator to respond to a spill. In the case where a non-responsible operator response, GORTT will fully reimburse them.

Option 2: Operator Subscription to a Tier 2 Base

- Operators will be required to subscribe to a Tier 2 base (see list of definitions) in order to singly or collectively cover Tier 2 oil spill incidents.
- Oil and Gas Operators will be "area coordinators" for their licensed areas especially for non-associated operations with the oil spill risks. Areas that may be impacted by their operations outside of the licensed areas must be coordinated with other neighbouring operators.
- Operators will handle Tier 1 spills. Tier 1 is to be defined for each operator based on risk assessment which will aid definition of Average Most Probable Discharge and required response capabilities and response time requirements.
- Mystery spills will be addressed by the Tier 2 base
- There will be a separate unit of TTCG (in TTCG or ODPM) that will have their own equipment or optionally be a subscriber to the Tier 2 base.

APPENDIX C – SUPPORT ORGANIZATIONS AND ROLES

Members of support organisations can be consulted ad hoc or on an individual basis, or as a group or part of the group as required in relation to the needs of the particular incident. When assembled as a group, the chairperson will be the National Controller.

Agency	Responsibilities
EMA MALMR/ FD IMA, CARIRI	<ul style="list-style-type: none"> • advice on operations that affect natural resources, environmental issues, cleanup of coastline • scientific support and evaluate sensitivity of threatened areas • supervise cleaning of coastline and disposal
TTCG, CAD TTAA, MSD	<ul style="list-style-type: none"> • marine and air surveillance, Incident Commander at Sea and support • personnel, arrest/detention of offending vessel/personnel • monitoring and aerial logistic support
TTPS, DPP, MSD, TTCG	<ul style="list-style-type: none"> • assist in investigation incidents, arrest/detention of offending • vessel/personnel, prosecuting ship owner/personnel • evacuation
AG MEEI, ODPM	<ul style="list-style-type: none"> • legal aspects
TSTT	<ul style="list-style-type: none"> • national telecommunications
MEEI, TTCG, EMA, ODPM	<ul style="list-style-type: none"> • technical and operational support
MOWT	<ul style="list-style-type: none"> • terrestrial transport, infrastructure
WASA	<ul style="list-style-type: none"> • sewage system, potable water
Regional Corporations ODPM, TTCG Oil Companies	<ul style="list-style-type: none"> • provide personnel and/or equipment as necessary
TDC Regional Corporations MOWT	<ul style="list-style-type: none"> • liaison between OSC and tourist facilities impacted, help to assess priority/sensitivity criteria for response/protection, participate and advise in public relations
MOF	<ul style="list-style-type: none"> • financial advice, funds, accounting of costs, evaluation of reclamations and compensation
MOH	<ul style="list-style-type: none"> • health matters
C&E	<ul style="list-style-type: none"> • expedite entry of equipment required for response, deny outward clearance to any vessel or equipment involved in a pollution incident
Immigration Division, MNS	<ul style="list-style-type: none"> • expedite entry of personnel required for response, deny outward clearance of personnel involved in a pollution incident
Oil Companies, Contractors	<ul style="list-style-type: none"> • expert advice and equipment

APPENDIX D - ORGANIZATION PLAN CHART

An organization chart clearly identifies individuals (according to positions) who will be involved in a spill response. It may also include administrative personnel responsible for documentation and financial aspects. An Incident Command System standardizes the process of preparing an organization chart (see below).

A decision is required as to which personnel should be part of an organization chart for any particular operation. Adjustments can still be made to the suggested information if training or an actual spill indicates changes are required. Consider also what external personnel requirements may be required for spills that are:

- large
- require a lengthy time for cleanup
- outside (Trinidad and Tobago) geographical area of jurisdiction

The duties and responsibilities must be detailed for all positions that appear in notification and organization charts. For some types of operations it may be beneficial to identify the duties and responsibilities for each of the three designated levels of spills.

1.0 ICS Organization

The ICS organization is comprised of five functional sections: Command, Operations, Planning, Logistics and Finance. A "basic" and an "expanded" ICS structure are shown in Figures 1 and 2 below.

Figure 1: Basic ICS Structure

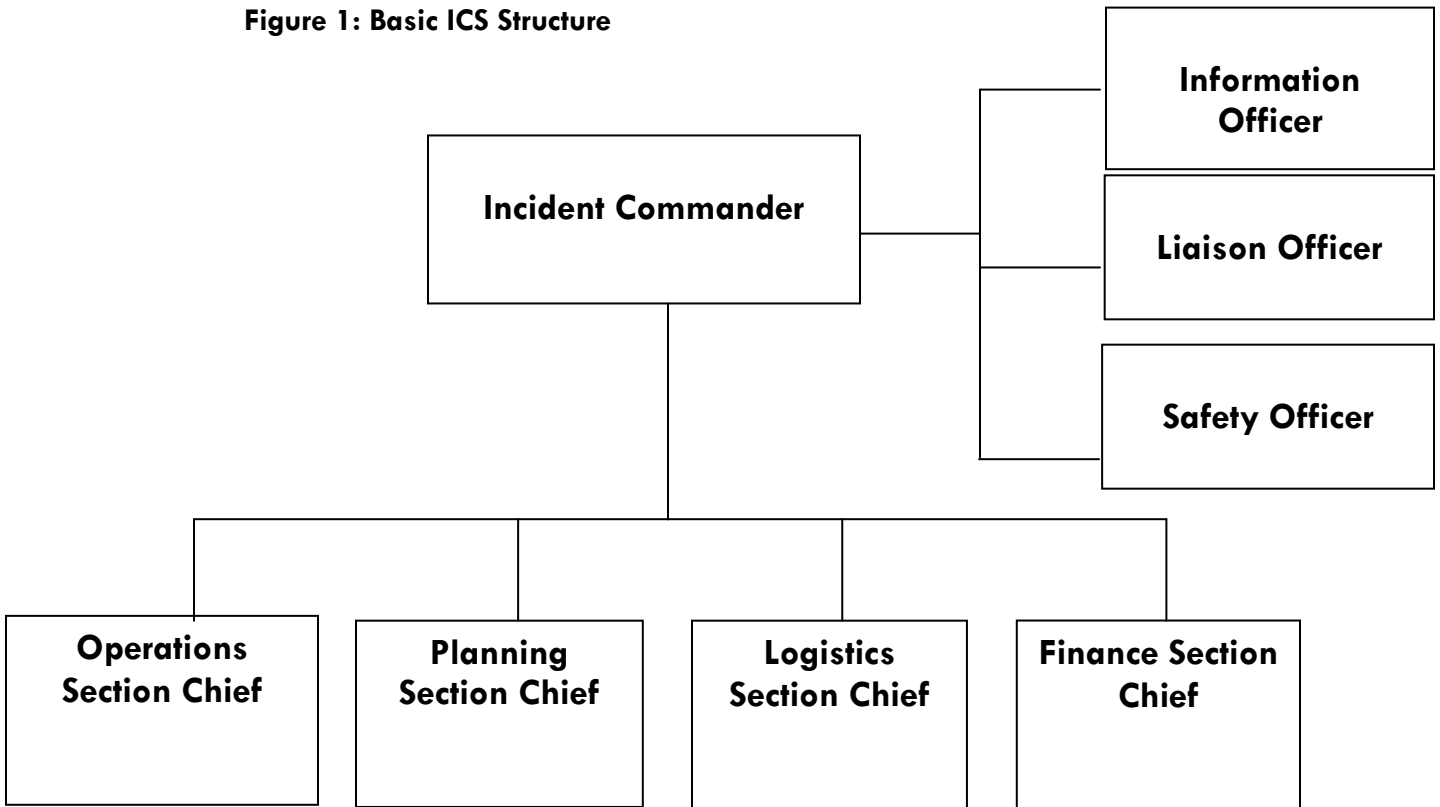


Figure 2: Basic ICS Organization Chart

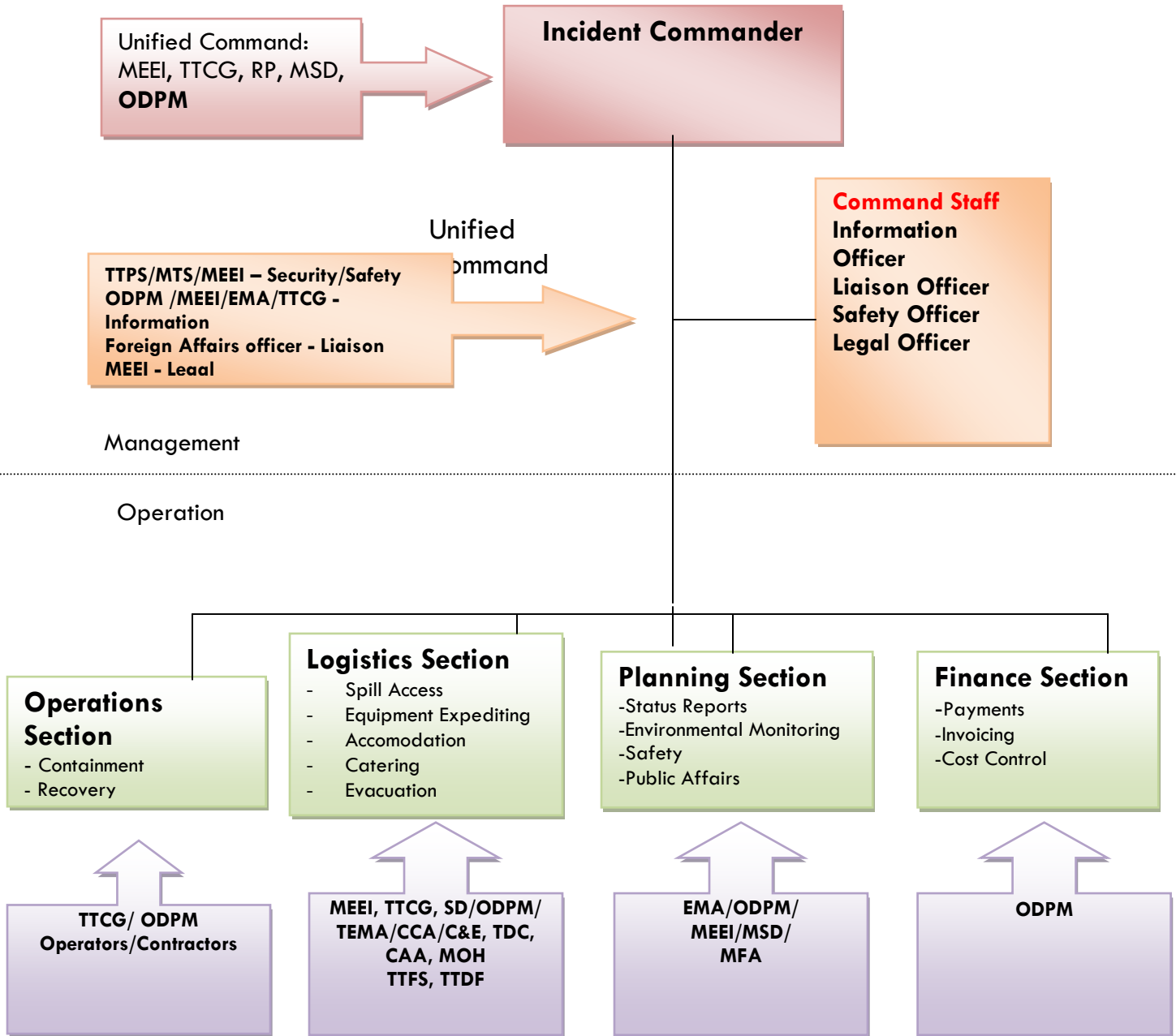
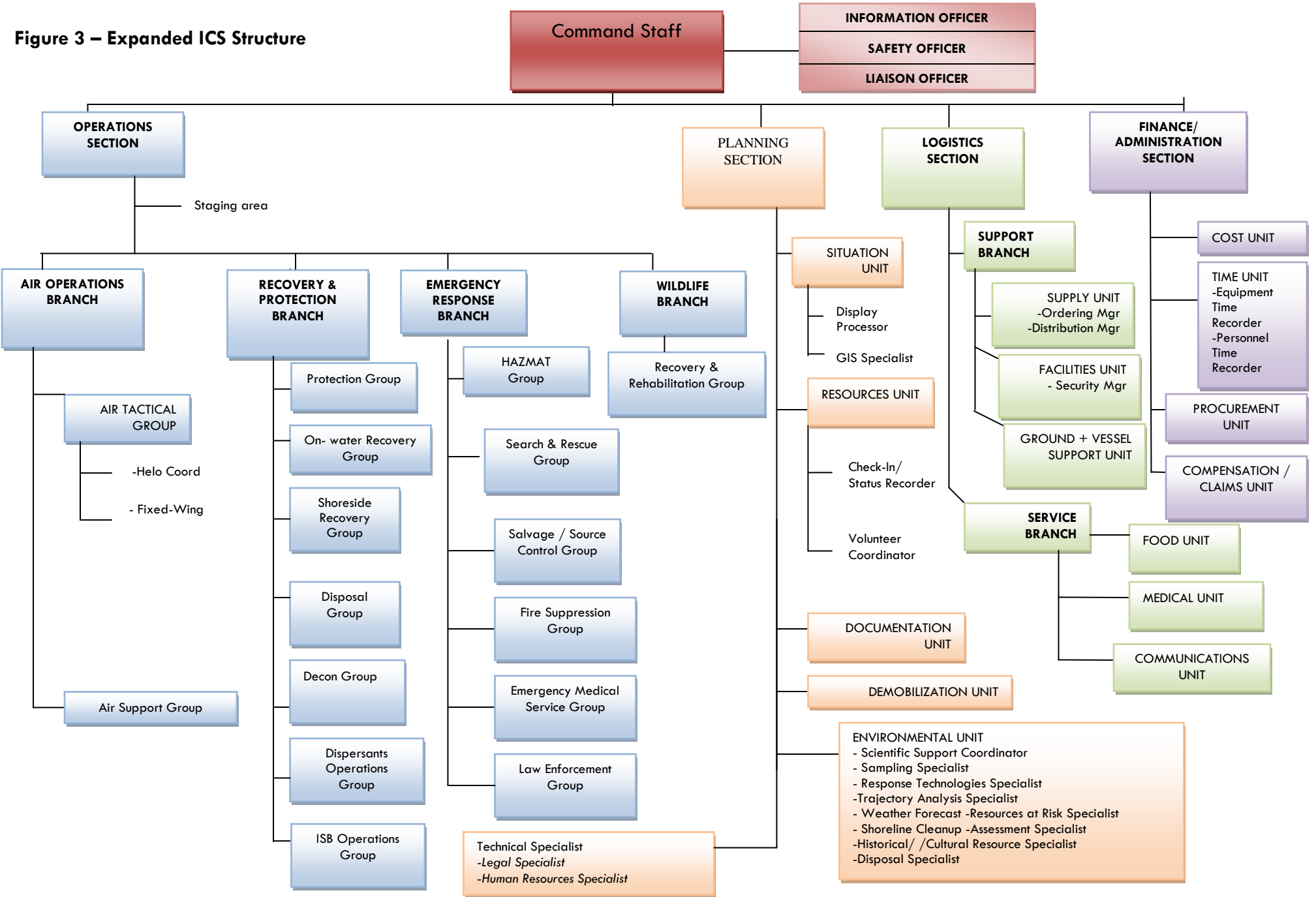


Figure 3 – Expanded ICS Structure



KEY PERSONNEL - IMT

IMT DUTY TITLE	IMT MEMBER	ORG
Incident Commander	National Controller	ODPM
	Director MSD or designate	MSD
	COCG or designate	TTCG
Deputy Incident Commander	Nominee	ODPM
	Commander Operations	TTCG
	Nominee	MSD
	Nominee	MEEI
Information Officer	Communications Specialists/ Public Relations Officer	MEEI, TTCG EMA, ODPM
Safety Officer	Nominee Safety Officer	ODPM TTCG
Liaison Officer	Nominees Commander Operations nominee	MFA, ODPM TTCG
Operations Section Chief	Commander Operations nominee	TTCG
	Operations Mgr	TTR
	Nominee	ODPM
Air Operations	TTAG Personnel	TTAG
Recovery & Protection <ul style="list-style-type: none"> • Protection Group • On-water recovery group • Shoreside Recovery Group • Disposal Group • Decon Group • Dispersants Operations Group • In-situ Burning operations Group 	Coast Guard nominee Coast Guard nominee Coast Guard nominee Coast Guard nominee Coast Guard nominee Coast/Air Guard /Petroleum Chemist Fire Officer, Coast Guard Officer, EMA Compliance Officer	TTCG TTCG TTCG TTCG TTCG TTCG/ TTAG/ MEEI, TTFS TTCG, EMA
Emergency Response Group <ul style="list-style-type: none"> • HAZMAT Group • Search & Rescue Group • Salvage/Source Control Group • Fire Suppression Group • Emergency Medical Services Group • Law Enforcement 	Fire Officers Coast Guard Officers Coast Guard Officers Fire Services Emergency Personnel Hospitals/Clinics Ambulance Service, Police Officers TTCG	TTFS TTCG TTCG, MSD TTFS EMS TTFS TTCG
Wildlife Branch <ul style="list-style-type: none"> • Recovery and Rehabilitation Group 	Wildlife Orphanage & Rehabilitation Centre (W.O.R.C.) Trinidad and Tobago	NGO's Forestry Division

Planning Section Chief	Senior Environmental Specialist Environmental Managers Planning Officers Senior Petroleum Engineers	TTCG ODPM MSD
Situation Unit <ul style="list-style-type: none"> • Display processor • GIS Specialist 	Environmental Specialists	Petrotrin, bpTT
	Draughtsmen	MEEI UWI ODPM
Resources Unit <ul style="list-style-type: none"> • Check-in/Status Recorder • Volunteer Coordinator 	Human Resources Officers MILAT/MYPART/CCC Civilian Conservation Corp thru TTDF/SYSP. Director SYSP/CCC	MEEI TTCG MSD TTDF/SYSP ODPM
Documentation Unit	Administrative Assistants	ODPM MSD TTCG
Demobilization Unit	Coast Guard Officer	TTCG
Environmental Unit <ul style="list-style-type: none"> • Scientific Support Coordinator • Sampling Specialist • Response Technologies Specialist • Trajectory Analysis Specialist • Weather Forecast – Resources at Risk Specialist • Shoreline Clean-up - Assessment Specialist • Historical/Cultural Resources Specialist • Disposal Specialist 	Research Scientist Chemist Environmental Specialist Environmental Specialist Meteorologist Environmental Specialist Archaeologist Cultural Specialist Solid Waste, Liquid Waste Disposal Specialists	IMA IMA, CARIRI TTCG MEEI, EMA, TTCG Met. Office COPE EMA, MEEI Arch. Soc. COPE SWMCOL, Contractor

Logistics Section Chief	Senior Coast Guard Officer Nominee	TTCG ODPM
Support Branch <ul style="list-style-type: none"> • Supply Unit • Facilities Unit • Ground and Vessel Support Unit 	Coast Guard Officers	TTCG
Service Branch <ul style="list-style-type: none"> • Food Unit • Medical Unit • Communications Unit 	Coast Guard Officers Coast Guard Officers Coast Guard Officers	TTCG
Finance/Administration Section Chief	Head Accountant	ODPM TTCG
Cost Unit	Accountants	TTCG/TTDF ODPM
Time Unit <ul style="list-style-type: none"> • Equipment time recorder • Personnel time recorder 	Accountants	TTCG/TTDF ODPM
Procurement Unit	Administration	MNS ODPM
Compensation/Claims Unit	Petroleum Pollution Compensation Tribunal	ODPM/MEEI/MFA

APPENDIX E – NOTIFICATION CHARTS/ALERTING SEQUENCE

5.0 Alerting Sequence

Figure 4: Spill Notification Chart for Trinidad Spills (Tier 1, 2 and 3)

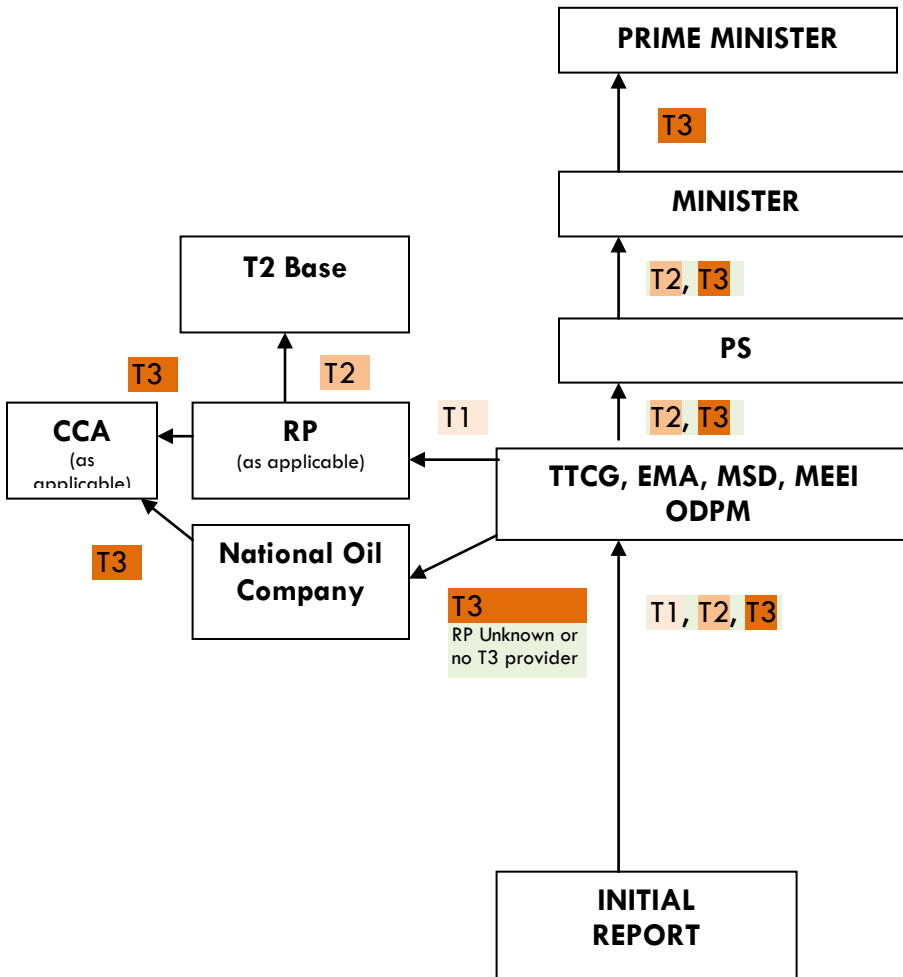
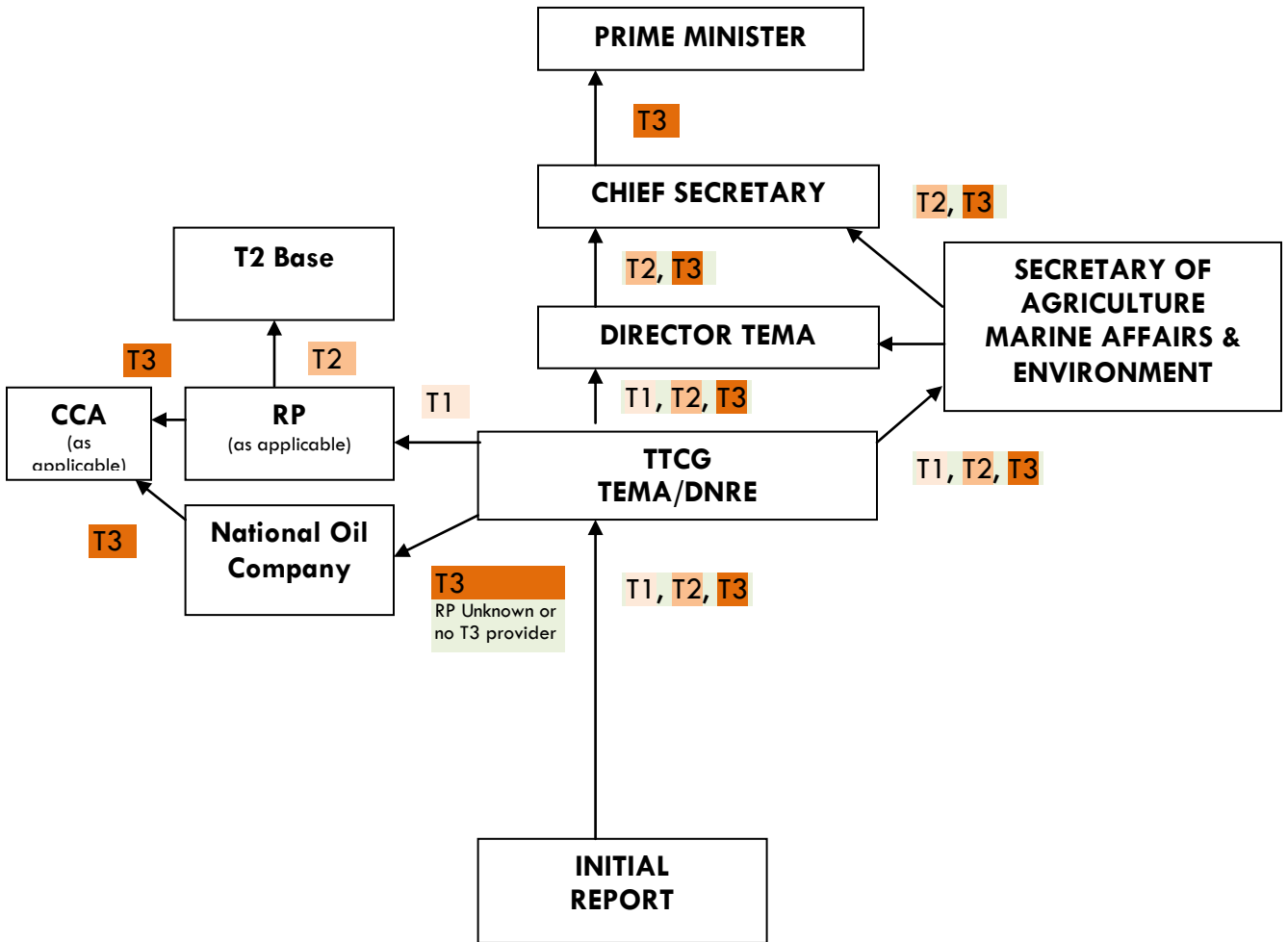


Figure 4: Spill Notification Chart for Tobago Spills (Tier 1, 2 and 3)



APPENDIX F - LOCALLY AVAILABLE OIL SPILL RESPONSE RESOURCES

EQUIPMENT CATEGORY	Equipment Type	COMPANY						
		NP (Sea Lots, Port of Spain)	Petrotrin (Pointe-a- Pierre)	BpTT LLC (Galeota Point)	Petro-Canada (La Brea)	BHP Billiton (Tobago, Guayaguayare)	Repsol (Galeota Point)	NGC
Booms	Offshore/Ocean Boom		2800	-	1500	-	1200	-
	Shore Sealing Booms		1050	4500		2400	600	-
	Nearshore Boom		4430	1300	2500	200	1200	-
	Sorbent Boom		1110	2500	480	9250	120	-
	Beach Boom		570	0		1300	1000	-
	Other Types		3000 (floating)	1500		-	500	-
	Towing Bridles		-	-		4	8	-
Boom Anchor Systems	Anchors		2	-		13	14	-
	Anchor Chain		Included	-		Included	Included	-
	Anchor Line		Included	-		Included	Included	-
	Anchor Buoys		Included	-		Included	Included	-
Sorbents	Granular		45,000lbs	200lbs		-	-	-
	Sweeps		-	-		14000	-	-
	Pads		10 bales	-		-	4 bales	1800

EQUIPMENT CATEGORY	Equipment Type	COMPANY						
		NP (Sea Lots, Port of Spain)	Petrotrin (Pointe-a- Pierre)	BpTT LLC (Galeota Point)	Petro-Canada (La Brea)	BHP Billiton (Tobago, Guayaguayare)	Repsol (Galeota Point)	NGC
	Mops		10	-		-	-	-
	Other		5 rolls	-		-	-	-
Skimmers	Vacuum skimmer		0	1		0	-	-
	Rope Mop skimmer		2	2		0	-	-
	Disc skimmer		1	0	1	1	-	-
	Portable Skimmer		2	2		0	-	-
	Desmi minmax		2	1		0	-	-
	Other skimmers		1 manta ray	0		2	1 manta ray	-
Pumps	Engine Driven Pumps		-	2		5	3	Yes
	Other Pumps		-	-		-	-	
Washers/Sprayers	Pressure Washers		-	0		2	-	
	Back Pack Sprayers		-	4		-	-	
Holding/Temporary Storage Tanks	Tanks		-	2		9	3	
	Megabags		-	-		50	-	
	Others		8	-		3	-	

EQUIPMENT CATEGORY	Equipment Type	COMPANY						
		NP (Sea Lots, Port of Spain)	Petrotrin (Pointe-a- Pierre)	BpTT LLC (Galeota Point)	Petro-Canada (La Brea)	BHP Billiton (Tobago, Guayaguayare)	Repsol (Galeota Point)	NGC
Dispersant & Cleaners	Corexit A9500 - gals		825	5500		3450	220	
	Corexit Other -		3135 (polychem)			-	-	
	MH 16		-	-		0	-	
	Beach Cleaner		-	500		-	-	
Dispersant Applicators	Pump Assemblies		-	1		1	1	
	Educator Systems		-	-		3	1	
	Spray Booms		1	0		2	1	
	Helibucket		-	-		1	-	
Support Equipment	Helicopter Access		2	3		-	1	
	OSR Boats		2	2		-	1	
	Work Boats		2	6		-	2	
	Fixed Wing Access		2	-		-	-	
	PPE		-	-		-	16 sets	
	Gas Detectors		4	-		-	-	
	Generators		1	-		1	-	

EQUIPMENT CATEGORY	Equipment Type	COMPANY						
		NP (Sea Lots, Port of Spain)	Petrotrin (Pointe-a- Pierre)	BpTT LLC (Galeota Point)	Petro-Canada (La Brea)	BHP Billiton (Tobago, Guayaguayare)	Repsol (Galeota Point)	NGC
	Personnel decon kit		-	-		-	1	
	Mobile Command Centre		0	1		-	-	
Services	OSRO Services Contractor		T.N. Ramnauth	Eastern Divers		-	-	
	Trajectory Modelling		1	1		1	-	
Warehousing			Pointe-a- Pierre	Galeota		Tobago, Guayaguayare	Galeota	

APPENDIX G - SPILL RESPONSE AND CLEANUP STRATEGIES

This Appendix describes applicable oil spill response strategies. Details on how to perform the operations will be made available in a reference manual or training program.

Considerations for Developing Spill Response Strategies

Planning & Logistics	Response time to be within 4 to 6 hours.
Spills on Land	Containment methods for spills onto land to prevent further spreading and contamination of watercourses and freshwater. Methods include dykes, trenching and burning. Where possible, heavy equipment from <u>MOWT or Regional Corporations</u> would be used. Tar balls from illegal spillages also require beach clean-up.
Spills on Water (Open Sea)	<p>Options may include booming, skimming, removal, storage, dispersants and in-situ burning.</p> <p>Booms are commonly placed:</p> <ul style="list-style-type: none"> • across a narrow entrance to the ocean, such as a stream/river outlet to close off that entrance so that oil can't pass through into marshland or other sensitive habitats. • in places where the boom can deflect oil away from sensitive locations, such as mangroves, shellfish beds, beaches used by piping plovers as nesting habitats etc.. • around a sensitive site, to prevent oil from reaching it. <p>Small and medium size spills</p> <p>It is recommended to use a skimmer(s) in conjunction with a Side Fitted Single vessel sweep (single or double sided) with the skimmer(s) placed in the apex of the sweep boom(s). "V" shaped sweeps are strongly recommended because of its excellent manoeuvrability.</p> <p>Large oil spills</p> <p>For larger oil spills, the Side Fitted Single Vessel "V" Sweep configuration may be combined with a large "U" configuration with an open apex. The oil - which is concentrated by the large "U" - will be guided into a narrow stripe behind the U-sweep, and may immediately be contained and recovered by the Side Fitted Single Vessel Sweep following right after the "U".</p> <p>Oil Recovery</p> <p>The recovery vessel's forward movement will force the floating oil - trapped inside the sweep – to concentrate at the apex of the boom formation. Allow the oil layer to build up before starting the skimmer. An oil layer of at least 2.5 to 5 cm (1-2") is recommended. No type of skimmer will work efficiently in a real life situation without the presence of sufficient amounts of oil. But on the other hand</p>

	<p>the oil should continuously be pumped away as it enters the skimming zone. Otherwise it may escape under the boom. It is a question of obtaining a balance, and only the actual situation can indicate where this balance is. It is always better to start skimming too early than too late. In the first case, you may recover more water than necessary (dependent on type of skimmer), but in the second case you may lose the oil under the boom. If you recover too much water, it is not necessarily a big problem, as long as the type of skimmer pump used does not emulsify oil and water. Recovered water can easily be decanted from the storage tank, to be discharged in front of the sweep. In this way, any oil in the decanted water will be recovered again.</p> <p>Dispersant application involves the spraying of chemicals by aircraft or boat to accelerate the natural dispersion of the oil.</p> <p><u>For the North and East Coast Trinidad: Booming in Open Sea is not normally possible. Application of dispersant may be warranted based on the size of spill. If the spill appears as a sheen, dispersant will not be necessary. For containment, booming of sensitive coastal areas is the priority.</u></p> <p><u>For the West Coast Trinidad: Booming, Skimming, Removal, Storage and Dispersants may be necessary.</u></p> <p><u>For Tobago: Booming, Skimming, Removal, Storage and Dispersants may be necessary on all sides of the island to protect beaches and sensitive areas.</u></p>
<p>Spills on Water (Rivers)</p>	<p>The aim is to keep the recovery equipment fixed to the river bank or structures in the river, while the water with the spilled oil is doing the work. Always try to deflect the oil to the slow side (the inner bank at a curve) of the river, if possible.</p> <p>The speed of the river current may require that the booms are positioned in a very small angle relative to the direction of the current. This is due to the fact that the speed of the water perpendicular to any section of boom must be less than 0.7 knots.</p> <p>The skimmer must be placed in a way which ensures the maximum flow of oil to it. In some situations it is possible to form a small circulation area close to the river bank, where the deflected and concentrated oil will rotate in a direction driven by the incoming oil, flowing along the boom. In this way the oil moves away from the critical entrainment zone at the apex, thus better avoiding loss of oil under the boom. Another very efficient way to ensure this, is to dig a small pond right next to the river. The river and the pond must be connected with one or two ditches. Use the boom to guide the oil into the pond. Both solutions work very well with the skimmer placed in the middle of the circulating oil.</p> <p>It may not always be possible to drive a truck all the way to the river bank, as the ground is too soft or muddy. It may be necessary to man-carry the recovery equipment to the river. So low weight is of essence here.</p> <p>Large debris must be deflected before it enters the boomed area. Rakes used from small boats will be quite useful. In some situations it is even possible to</p>

	<p>deflect large debris by means of a steel wire stretched across the river in or below the water surface, and placed in a small angle relative to the direction of the current.</p>
<p>Spills on the Shoreline</p>	<p>Spills on shorelines are threatening to the wild life environment and may result in the most costly recovery method. It should therefore be avoided by recovering as much oil as possible in the open water. The different shoreline types falling within the affected area should be identified and quantified and the most appropriate clean-up strategy for each considered. Factors to be taken into account include amenity value, whether beaches are easily accessible for heavy equipment and the ability of the beach to support such vehicles. The use of dispersants or surface-film chemicals in beach clean-up can, in some circumstances, can be helpful if used ahead of oil impact on the shore. They can also be used in the final stages of shoreline cleaning. Manual cleanup followed by natural weathering of the remaining oil is preferred for ecological reasons. Chemicals used on shoreline cleanup must be approved by the Relevant Authorities for the intended use. This approval must be obtained in writing, prior to application during an incident. Associated safety and environmental risks must be carefully evaluated and legal issues addressed, as is the case for all response options. There are several ways of acting in the event of an oil spill on the shoreline, but they all depend on the actual situation:</p> <p>Sandy Beaches</p> <p>Small to medium size spill: Use beach cleaning machines or bulldozers on the beach if it will carry the weight of such vehicles. If there is no significant surf, you can wash and push the oil back into the sea, to be recovered by a small shallow water skimmer, operating in an area surrounded by a beach boom. Dig a hole under the skimmer if the water is too shallow. Use a Fast-tank or a rigid open container for temporary storage.</p> <p>Larger spills/light to medium viscosity: Fence in the oil by means of a shoreline boom, and operate a shallow water skimmer from the beach. If possible, try to push or wash the oil on the beach back into the water in order to let the skimmer recover it. Severe surf will make this operation difficult, if not impossible. A skimmer head or pump with a self adjusting weir lip - mounted on a "Hiab" type hydraulic crane - a so called "Sweeper", is a very useful tool for this type of spill response. The skimmer- or pump head can always be placed in the best recovery position, remotely controlled from the beach, a vessel, or a barge. Fast to operate and safe for personnel. Pump the oil to a land-based storage or to a sea-based facility such as a barge or a towable storage bladder (TSB).</p> <p>Larger spills/high viscosity: As just above, but due to the viscosity it may be necessary to dismantle the skimmer pump from the floats and use it for transfer of the spilled oil. Sometimes the oil emulsion in the water next to the beach will be so highly viscous that a skimmer cannot sink into the oil. It will stay on top of it. Therefore a skimmer pump, mounted on a "Hiab" type hydraulic crane, is also a useful tool.</p>

Stony or Rocky Beaches

Small to medium spill/light to high viscosity: Use absorbents for small amounts of oil and when gentle treatment is required. For larger amounts the best way to recover the oil from a rocky coast is to wash the oil back into the sea, using fire hoses or high pressure- or hot water cleaners, and let a small shallow water skimmer recover it there. Work in an area fenced-in by a shoreline boom. Use a Fastank or a rigid open container for temporary storage.

It must always be considered whether it is environmentally feasible to pressure wash a coast line. If there are important living organisms at risk, and the spill is too big for using absorbents, a more gentle treatment with bio-degradable detergents or surface washing agents could be the option. No action at all may in some cases be the best solution.

Large spill/light to medium viscosity: As above for small spills. However, larger skimmers and pumps can be used. Operate the skimmer from the shore, from a vessel, or from a barge, and store the oil in a land or sea-based temporary storage facility. A skimmer head or pump with a self adjusting weir lip - mounted on a "Hiab" type hydraulic crane - a so called "Sweeper", is a very useful tool for this type of spill response. The skimmer- or pump head can always be placed in the best recovery position, remotely controlled from the beach, a vessel, or a barge. Fast to operate and safe for personnel. Let nature finalize the cleaning process, or use a bio-degradable detergent or surface washing agent. Use absorbents whenever feasible.

Large spill/high viscosity: As just above, but dismantle the skimmer pump from the floats for transfer of the oil. A skimmer can be used by means of a feeder which can force heavy oil into the transfer pump. Some times the oil emulsion in the water next to the beach will be so highly viscous that a skimmer cannot sink into the oil. Therefore a skimmer pump, mounted on a "Hiab" type hydraulic crane, is also a useful tool here. Let nature finalize the cleaning process, or do the final cleaning using a bio-degradable detergent or surface washing agent.

Gravel Beaches Subject to Tidewater

Gravel beaches and tidewater cause special problems for oil spill responders. When the tide goes down, the oil sinks with the water level deep into the gravel and at every high tide the oil will be back at the surface. If you try to wash the top layer of gravel at low tide, it may appear clean until after the next high tide. Then new oil "from the deep" will cover the beach.

A careful assessment of the pros & cons of cleaning must be performed prior to doing anything to these beaches.

Natural degradation may be the fastest and safest way for the environment.

<p>Wetlands, Mangrove Swamps and Marshes</p>	<p>These areas are priority for protection. The main protection options are booming and mechanical recovery.</p> <p>If oil enters these areas the main cleanup options are:</p> <ul style="list-style-type: none"> • Natural Recovery – no action • booming and skimming of oil on the water surface in creeks; • pumping of bulk oil from sediment surface, depressions and channels; • low pressure water flushing of free oil from sediment surface and vegetation into areas where it may be collected; and • use of absorbent materials with subsequent collection and disposal. <p>No Action/Natural Recovery</p> <p>There are several circumstances under which it is appropriate to do nothing. The foremost of these situations is when cleanup would cause more harm than benefit to mangroves or other associated habitats, or when shorelines are inaccessible. When no cleanup is conducted, oil will slowly degrade and be removed naturally, assisted by natural and storm-generated flushing. Spills of light oils, which will naturally evaporate and break down very rapidly, do not require cleanup. Such light oils are usually gone within days. Furthermore, light fuel oils such as gasoline and jet fuels typically impart their toxic impacts immediately, and cleanup can do little to reduce the damage. It is important to recognize, though, that even where no cleanup is advisable, light oils can cause significant injury and contaminated mangrove habitats may require many years to recover. Cleanup also is not recommended for small accumulations of oil, regardless of product type. Impacts caused by light accumulations generally do not warrant the tradeoffs associated with cleanup activity. Even for major spills, there may be cases for which it is best to take no action, depending on the nature of the oiling and the characteristics of the mangrove forest affected. Generally, cleanup should not be conducted in interior areas of mangrove forests because of the risk of damaging mangrove roots and seedlings, trampling oil into the sediment where it will degrade much more slowly, and spreading oil into previously areas where oil had not previously spread. Exceptions may be made if access is possible from upland areas or if vegetation is sparse enough to permit access without injury to pneumatophores and prop roots. If cleanup is attempted in interior mangroves, experienced personnel must constantly oversee cleanup crews to prevent further injury. In any case, attempts should be made to control the movement and spread of any mobile oil within the mangroves to prevent contamination of adjacent areas. Several response techniques described below, including barriers, passive collection, and flushing can be used to help control and contain oil.</p> <p>Barrier Methods - Booms</p> <p>Several forms of barriers can deflect or contain oil, including booms, sediment berms, dams, and filter fences. Barriers can be used along mangrove shorelines and inlets to prevent oil entry. Proper strategic boom deployment in sheltered lagoon areas may be highly effective in trapping large quantities of oil and</p>
---	---

reducing oil impact to interior mangroves. To be effective, barriers must be deployed immediately after a spill before oil moves into mangrove areas. This means that appropriate types and sufficient amounts of barrier materials must be stockpiled and available at the time of the spill, and that strategies for boom placement and deployment have already been established and tested. Because of the soft substrate and sensitivity of prop roots and pneumatophores, barrier methods should be deployed carefully and maintained vigilantly to prevent physical damage during installation and removal. Untended boom that breaks loose can become entangled in the mangrove fringe, breaking off pneumatophores, prop roots, and juvenile plants. Where barrier methods are not an option, mangrove forests will remain vulnerable to contamination. For example, booms

generally cannot be deployed successfully along mangrove shorelines with strong currents or along sections of mangrove shorelines behind shallow flats. Booms are usually not effective with light oils because they can readily mix into the water column and pass under floating boom. Heavier oils are more likely to remain at the water surface and so are more easily controlled with booms, although very heavy oils can sometimes become negatively buoyant and pass under boom.

Pumping/Vacuumping

Vacuumping can remove pooled oil or thick oil accumulations from the sediment surface, depressions, and channels. Vacuum equipment ranges from small units to large suction devices mounted on dredges, usually used outside vegetated areas. Generally, vacuumping should be conducted only at the outer fringe of mangrove forests; it is most feasible and least damaging where vegetation is not very dense, enabling easy access. Vacuumping can be used effectively on heavier and medium oils, providing they are still reasonably fluid. Lighter, more flammable petroleum products such as jet fuel and diesel generally should not be vacuumped.

Use of Sorbents

Sorbent boom or other sorbent materials can be placed at the fringe of oiled mangrove forests to passively recover any mobile oil, including sheens. Sorbents are oleophilic and either absorb or adsorb oil. They can be composed of either synthetic or natural materials, and they come in a variety of forms, including sausage boom, "pom-pom" or snare boom, sheets, rolls, pellets, and loose particulates. Sorbents vary in their effectiveness depending upon oil type, degree of oil weathering, and sorbent absorption or adsorption capacity. Sorbent materials must be placed and removed carefully to minimize disturbance of sediments and injury to mangrove roots. Sorbent materials must be closely monitored to ensure they do not move and damage mangrove roots, and must be removed when they become saturated or are no longer needed. Sorbents have been used to wipe heavy oil coating from mangrove surfaces. Before using sorbents in this way, consideration should be given to associated physical damage. This activity is best conducted only in areas where substrate is firm enough to prevent oil mixing into it.

	<p>Low-Pressure Ambient Water Flushing</p> <p>Low-pressure flushing with ambient seawater can wash fluid, loosely adhered oil from the sediment surface and mangrove vegetation into areas where it can be collected, as long as it can be done without resulting in significant physical disturbance of the sediment. Generally, flushing is most feasible at the outer fringe, but can sometimes be used to remove oil trapped within the mangrove forest. Flushing at water levels high enough to submerge sediments may help minimize impact to the substrate. If substrate mixing is likely or unavoidable, responders should allow the oil to weather naturally. Flushing is not effective with heavy oils, such as Bunker C, or highly weathered oils. Oil should be flushed only during ebbing tides to move it out where it can be collected. Flushing can be a useful technique to help control the movement and spread of mobile oil in mangrove areas to prevent contamination of adjacent areas. When flushing free-floating oil, care should be taken to minimize emulsification.</p>
<p>Coral Reefs</p>	<p>There are many factors that influence the effect of an oil spill on an ecosystem and these must be taken into consideration when dealing with coral reefs.</p> <p>Some of the most obvious factors are:</p> <ul style="list-style-type: none"> • The amount and type of oil spilled; • The degree of weathering of the oil prior to contact with corals; • The extent of the contamination; • The presence of other stress factors, such as high sedimentation; • Physical factors such as storms, rainfall and currents – the state of the tide during the initial contamination is very important; • The nature of the cleanup operation; • The type of coral; and • Seasonal factors, e.g. coral spawning. <p>The goal of spill response in coral areas is the same as in any other habitat—to minimize damages caused by the accident and any associated spillage. Choosing response methods carefully, with an understanding of the sensitivities of the reef environment, will minimize any additional impacts incurred from the cleanup</p> <p>Skimmers and booms are the main options that can be used however the following should be noted:</p> <ul style="list-style-type: none"> ◆ Booms should be tended regularly so they do not harm shallow reefs ◆ When anchoring booms care should be given not to damage corals <p>NOTE:</p> <p>(a) Chemicals should never be used in these sensitive areas.</p> <p>(b) It is recognized that these areas are not generally easily accessible and heavy cleanup operations may cause physical damage. Care must be taken in any associated cleanup activity to minimize damage.</p>

Spill Monitoring	Spill monitoring includes safety and occupational health conditions, existing and possible environmental threats and for river and offshore spills, trajectory modelling.
Removal	Techniques for skimming and collection of oil released onto land or into water. Transfer Equipment needed to move collected liquids and solids to interim storage and disposal facilities.
Control Points	Specific geographical locations, primarily on rivers, which provide for the pre-planning of staging and deployment locations for oil spill response equipment. Pre-identification required of access, work area size, boat launches, equipment storage, natural boom anchors, water depth, water speed, flow patterns and water hazards.
Post-Spill Activities	Personnel decontamination, equipment cleaning, spill debris disposal, and maintenance, debriefing and review of strategies following an incident.

APPENDIX H - USE OF DISPERSANTS

As presented in the Caribbean Island OPRC Plan.

1.0 General Dispersant Policy for Island States and Territories

1.1 The Caribbean Plan envisions that each Island State or Territory will develop its own policy pertaining to the use of dispersants in its Exclusive Economic Zone (EEZ). The dispersant policy adopted by the State or Territory will be part of its National Contingency Plan.

1.2 Scientific studies over the past several years have shown that the new generations of dispersants, in themselves, exhibit low toxicity even at application concentrations ten times those prescribed. Studies have also shown that the concentration of dispersed oil in the water column drops off significantly at depths below three meters and, given reasonable flushing, dispersed oil does not remain in the area of application for any significant length of time as it is distributed and diluted by the currents. More or less, aggressive use of dispersants may be warranted. Each Island State and Territory is encouraged to establish guidelines based on its own environmental considerations and circumstances within its own territorial seas.

1.3 It is the position of the Island States and Territories that use of dispersants using the following parameters will cause no significant environmental harm from such use. It is the policy of the Island States and Territories that when combating spilled oil within its territorial seas, the OSC as authorized by the Lead Agency, may use dispersants without prior notifications to other Island States and Territories under the following parameters:

- a. The area of application is not less than one nautical mile from any shoreline, nor closer than three nautical miles up-current from important marine fisheries or coral reef ecosystems which are less than 20 feet from the water's surface;
- b. The water depth should exceed 10 meters (30 feet) in the area in which the dispersant will be applied;
- c. The method of application is one recommended by the manufacturer;
- d. The rate of application is as recommended by the manufacturer;
- e. The dispersants, exhibiting low toxicity; and
- f. The Lead Agency will notify potentially affected downstream Island States and/or Territories whenever dispersant use is intended to be conducted beyond its territorial seas.

1.4 In the event the OSC determined that the use of dispersants is necessary and if it is apparent that downstream Island States and/or Territories may be affected, then concurrence for such use must be obtained from the potentially affected Island States and Territories outside the parameters of section 10.3.3.

1.5 Response operations, including the application of dispersants, will not be conducted in the EEZ of another Island State or Territory without prior concurrence of the Lead Agency of that Island State and/or Territory.

1.6 During a dispersant operation, the OSC should determine the effectiveness of the dispersant application by on-scene observation and/or by laboratory testing. Application of dispersants should be discontinued if proven to be ineffective.

1.7 To establish an updated list of dispersants stockpiled in the region, each Island State or Territory will submit to the Focal Point Agency (IMO Regional Consultant) the quantity, size of storage containers, brand name, type, and location of storage. (Example: 12-55 gal. plastic lined drums of Corexit 9527). The updated information will be submitted on an EQUIPMENT/ DISPERSANT LOCATION page for insertion in Chapter 5 of the Caribbean Plan.

2.0 Application of Dispersants

2.1 The best combination of dispersants and application method must be selected for the specific situation. On the open sea they can be applied from surface vessels and from aircraft. It is very important to use proven equipment which has been properly calibrated and to follow the instructions of the suppliers of equipment and dispersants.

2.2 Spraying operations should be started as soon as possible after it has been decided that dispersant use will form part of the response. Many oils will form stable water-in-oil emulsions (chocolate mousse) of which the viscosity will be higher than that of the original oil. The extent of emulsification and the stability of the emulsion will depend upon the type of oil, sea state and temperature. The viscosity also increases because of the evaporation of lower molecular weight hydrocarbons. Both processes may have taken place to a considerable extent within a couple of hours after the spill and thus dispersant effectiveness may be reduced if application is delayed. After oil has emulsified into mousse, it is very difficult to disperse. Treatment with dispersants should, therefore, start before the mousse formation or extensive weathering has taken place.

2.3 Supplying an adequate quantity of dispersant to deal with a large spill can often be a problem. Spill response managers should include in their contingency plans an inventory of suitable dispersants and should be aware of how this supply can be augmented from additional resources. In the event that the supply is inadequate, spill response managers should prepare to use a combination of response techniques.

3.0 Operational Use and Application of Dispersants

3.1 In general, dispersants are applied either by surface vessels equipped with dispersant spray booms and support equipment (pumps, hoses, dispersant drum/tank) or by aircraft (fixed-wing or helicopter) using specially designed spray equipment and systems. In general, dispersants are only minimally effective when applied by means of fire monitors. Proper use of dispersants requires the

appropriate dosage in terms of amount of chemical per unit area, such as gallons per acre, litres per hectare, etc. The dosage is extremely variable and depends on the type of dispersant, type of oil, slick thickness, temperature, viscosity, and other characteristics of the spilled oil. The actual flow rates are a function of the vessel/aircraft speed, the pump capacity, the dilution rate, and the effective swath width covered.

3.2 Surface Application. Most surface dispersant spray systems existing in response inventories utilize a reduction pump system that dilutes a dispersant concentrate with seawater before being sprayed on the surface through multiple-nozzle spray booms. Mounting spray booms ahead of the vessel's bow wave and wake assist in proper application of the dispersant to the oil. Vessel sprays and pump system flow rates must be periodically calibrated to assure the desired dosage. Despite improvements in vessel spraying equipment, the technique will always have some limitations, due to the low treatment rates and inherent difficulties of location oil slicks from a vessel.

3.3 Aerial Application

In contrast, aerial spraying offers the advantages of rapid response, good surveillance, high treatment rates, optimum use of dispersant and better evaluation of dispersant treatment.

List of Approved Dispersants

CHEMICAL NAME	COMPANY	DATE APPROVED	APPROVAL PERIOD	EXPIRY DATE	USES
14 MC 01	TESL	20/01/2009	3 yrs	20/01/2012	Drilling Foam/Dispersant
D11	TESL	21/01/2009	3 yrs	21/01/2012	Dispersant
D11L	TESL	21/01/2009	3 yrs	21/01/2012	Dispersant
D-14P	Southern Chemicals Ltd.	28/05/2008	3 yrs	28/05/2011	Demulsifier/Asphaltene Dispersant
KX-100	United Energy Petroleum Services Ltd.	28/11/2008	3 yrs	28/11/2011	Wax/Asphaltene Blockage Dispersant
m-P45	Adam H. Equipment	07/10/2008	3 yrs	07/10/2011	Paraffin Inhibitor Dispersant Solvent
SAPP	M-I	28/11/2008	3 yrs	28/11/2011	Dispersant Thinner
Black Fury	M-I	21/12/2006	3 yrs	21/12/2009	Dispersant
Spersene CFI	M-I	05/10/2009	3 yrs	05/10/2012	Dispersant
TECHN-SOLV-2917	N&M Services Ltd	07/11/2006	3 yrs	07/11/2009	Paraffin and Asphaltene Dispersant
ZI-400	Interchem Ltd.	25/10/2007	3 yrs	25/10/2010	Dispersant/Alkali Detergent

APPENDIX J - SENSITIVE AREAS

Areas for Critical Protection

Area	Location	Critical Period of Year
Ports	Port of Spain, Pt. Lisas	N/A
Beaches	Beaches on East Coast, North Coast	
Fisheries	Gulf of Paria, East Coast	N/A
Reefs	Reefs around Tobago esp. Buccoo, Speyside, Drew Shallows	N/A
Birds	TBD	
Mangroves	TBD	
Industrial	Pt. Lisas, Pointe-a-Pierre, Pt. Fortin	All year
Cultural	Maracas Beach	
Tourism	Maracas Bay, Las Cuevas Bay, Manzanilla Beach, Matura Beach	N/A
ESAs	Buccoo Reef, Nariva Swamp, Aripo Savannahs, Matura National Park	N/A

Species for Critical Protection

Sensitive and Protected Species	Location	Critical Period of Year
Manatee	Nariva Swamp	N/A
Pawi	Forested areas	N/A
White-tailed Sabre Wing Humming Bird	Forested areas	N/A
Turtles: Leatherbacks, Hawksbills, Green Turtles, Olive Ridleys, Loggerheads	Matura, Fishing Pond and Grande Rivière	March to September

Shoreline Sensitivity for North East, East and South Trinidad and Tobago

It is expected that local and area contingency plans will utilize the Environmental Sensitivity Index as developed by the National Oceanic and Atmospheric Administration (NOAA) for classification of environmental sensitivity for the Coastal regions of Trinidad and Tobago that may be impacted by each potential responsible party based on an approved risk assessment.

The following table is a complete list of shoreline classifications for Environmental Sensitivity Index (ESI) maps for three types of environmental settings:

- **Estuarine.** River-mouth; salt- or brackish-water.
- **Lacustrine.** Related to lakes.
- **Riverine.** Related to rivers, particularly large rivers.

Lower rankings represent shorelines that are less susceptible to damage by oiling; higher rankings become more likely to experience damage by oiling.

Environmental Sensitivity Index (ESI) Key

ESI Rank	Estuarine	Lacustrine	Riverine
1A	Exposed rocky shores	Exposed rocky shores	Exposed rocky banks
1B	Exposed, solid man-made structures	Exposed, solid man-made structures	Exposed, solid man-made structures
1C	Exposed rocky cliffs with boulder talus base	Exposed rocky cliffs with boulder talus base	Exposed rocky cliffs with boulder talus base
2A	Exposed wave-cut platforms in bedrock, mud, or clay	Shelving bedrock shores	Rocky shoals, bedrock ledges
2B	Exposed scarps and steep slopes in clay		
3A	Fine to medium-grained sand beaches		
3B	Scarps and steep slopes in sand	Eroding scarps in unconsolidated sediment	Exposed, eroding banks in unconsolidated sediments
3C	Tundra cliffs		
4	Coarse-grained sand beaches	Sand beaches	Sandy bars and gently sloping banks
5	Mixed sand and gravel beaches	Mixed sand and gravel beaches	Mixed sand and gravel bars and gently sloping banks
6A	Gravel beaches Gravel beaches (granules and pebbles)*	Gravel beaches	Gravel bars and gently sloping banks
6B	Riprap Gravel beaches (cobbles and boulders)*	Riprap	Riprap
6C*	Riprap		
7	Exposed tidal flats	Exposed tidal flats	
8A	Sheltered scarps in bedrock, mud, or clay Sheltered rocky shores (impermeable)*	Sheltered scarps in bedrock, mud, or clay	

ESI Rank	Estuarine	Lacustrine	Riverine
8B	Sheltered, solid man-made structures Sheltered rocky shores (permeable)*	Sheltered, solid man-made structures	Sheltered, solid man-made structures
8C	Sheltered riprap	Sheltered riprap	Sheltered riprap
8D	Sheltered rocky rubble shores		
8E	Peat shorelines		
8F			Vegetated, steeply-sloping bluffs
9A	Sheltered tidal flats	Sheltered sand/mud flats	
9B	Vegetated low banks	Vegetated low banks	Vegetated low banks
9	Hypersaline tidal flats		
10A	Salt- and brackish-water marshes		
10B	Freshwater marshes	Freshwater marshes	Freshwater marshes
10C	Swamps	Swamps	Swamps
10D	Scrub-shrub wetlands; Mangroves**	Scrub-shrub wetlands	Scrub-shrub wetlands
10E	Inundated low-lying tundra		

* A category or definition that applies only in Southeast Alaska.

** In tropical climates, 10D indicates areas of dominant mangrove vegetation.

The overall coordination of development and maintenance of sensitivity maps (using GIS) resides with the Institute of Marine Affairs (IMA). Operators must develop sensitivity maps in accordance with the ESI methodology for areas that can be impacted by their operations based on a risk assessment. Where there is an overlap in the areas that can be impacted the cost of development should be shared equally. In areas where there are no operators to impact this cost is to be borne by the state through the TTCG.

APPENDIX K - RISK ASSESSMENT

The waters that are most threatened in Trinidad and Tobago are: East Coast Trinidad, Gulf of Paria, CDA area, and in Tobago, the Southern Coast.

Trinidad and Tobago lies just off the South American mainland, the most Southerly Caribbean Island State in the Caribbean Sea. There are no dedicated shipping lanes within Trinidad and Tobago waters except for the entry point into the major ports. These special conditions results in Trinidad and Tobago waters, including the Gulf of Paria, to become places of risk for marine transport and prone to spills or discharges of all types of oily residues from ships.

On the Atlantic side of Trinidad, the main polluting sources by petroleum hydrocarbons originate from marine traffic (including tanker traffic), oil and gas platforms, oil and condensate pipelines and the harbour activities of the Port at Galeota Point and at the Single Point Moorings of bpTT and BHP Billiton.

It is expected that the Licensees and PSC Operators will provide details on the risks within their licensed or contract areas in their Oil Spill Contingency Plans and the areas that can possible impacted by oil spills from their operations and other activities occurring with their licensed area.

Below is a template example of the kind of information that must be included in the risk assessments of Area and Local Facility Plans.

“At the ____ terminal of the _____, ____ tons per year of petroleum are handled. ____barrels can be stored in ____tanks in areas immediately adjacent to the ____.

In the Port of _____, ____km from _____, ____tons per year of used lubricants are handled of which ____tons are spilled. In this port, there are ____fishing boats.

Another source of potential petroleum contamination is the ____Pipeline, with a capacity of ____barrels/day. The pipeline crosses the ____and extends ____km transporting ____tanker crude oil from the ____to the ____.”

APPENDIX L - TRAINING AND EXERCISES

1.0 Introduction

The ultimate test of any contingency plan is measured by performance in a real emergency. It is vital therefore, that the NOSCP includes an ongoing programme to test the plan through realistic exercises.

2.0 Purpose

This exercise programme progressively prepares response teams to perform effectively in realistic representations of all the risks that the NOSCP has been designed to meet.

In addition, response strategies will be tested and recommendations made for modification or improvement to the NOSCP.

3.0 Legal Basis

Article 6 Clause 2 (b) of the OPRC convention requires, inter alia, that “In addition, 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:

2(b) a programme of exercises for oil pollution response organizations and training of relevant personnel;” Clause 177 4 (b) of the Shipping (Marine Pollution) Bill 2001 lays down the identical requirement as stated above.

The members of the Plan, at each level, will have periodic and regular exercises that involve the TTCG Unit and the MEEI to familiarize themselves with the operative procedures of the emergency response. The TTCG Unit and the MEEI should also coordinate its training exercises with any local industry exercises.

- A technical report must be submitted following each exercise, with the intention of making pertinent corrections to the Plan.
- Monthly: Persons in charge of plans distribute response operation planning information to relevant personnel.
- Bimonthly: Response equipment field exercise with oil companies and communications exercise.
- Semester: Each Local level, with the participation of the National level, will conduct a pollution simulation exercise in its jurisdiction.
- Annually: the MEEI, in conjunction with Support Agencies, will implement an exercise that involves national and international notification procedures and communications to facilitate the importing of resources and personnel.

4.0 Exercise Categories

Four exercise categories are identified which allow different aspects of the plan to be exercised separately and promote understanding of the purpose and scope of the whole plan. They are:

- notification;
- tabletop;
- equipment deployment; and
- incident management

- **Notification Exercises**

To test the procedures to alert and call out the response teams and are conducted through telephone and other means of communication, as stipulated in the response plan.

They are used to test communications systems, check availability of personnel, evaluate travel options and the speed at which travel arrangements can be made, and assess the ability to transmit information quickly and accurately.

This type of exercise will typically last one to two hours and may be held at any time, day or night, announced or unannounced.

- **Tabletop Exercises**

These consist of interactive discussions of a simulated scenario among members of a response team but do not involve the mobilization of personnel or equipment.

They focus on the roles and actions of the individuals, the interactions between the various parties and the development of information and response strategies.

A tabletop exercise might typically last four to eight hours and should be announced well ahead of time to ensure availability of personnel.

- **Equipment Deployment Exercises**

These involve the deployment of oil spill response equipment at particular locations in response to an oil spill scenario and in accordance with strategies laid down in the plan for a particular spill scenario. They test the capability of the response teams to respond to the three levels of oil spill incidents namely, Tier 1, Tier 2 and Tier 3 and provide experience of actual conditions and of oil spill scenarios while enhancing individual skills and teamwork. In some instances, an Equipment Deployment Exercise might be run in conjunction with a Tabletop or an Incident Management Exercise.

An equipment deployment exercise would typically last six to eight hours and should be repeated frequently until teams are acquainted with the equipment.

- **Incident Management Exercises**

These are often more complex in that they simulate several different aspects of an oil spill incident and involve third parties. Such an exercise may be of limited scope, for example, using own personnel to role-play the main external parties, or of full scope, when outside agencies and organizations are invited to provide personnel to play their own roles within the exercise.

These exercises require significant planning in terms of availability of personnel, development of an adequate scenario and the physical arrangements for staging such events.

An incident management exercise often lasts one to two days and incurs a high financial cost. Appropriate budget allocations should, therefore, be included in forward planning.

APPENDIX M - SALVAGE: Details of operations

1.0 Introduction

Following almost all serious incidents, the shipowner engages commercial salvors to deal with the casualty and secure the cargo and bunkers. The initial salvage options may include firefighting, counter-flooding, internal transfers, other actions to stabilise the ship, and perhaps emergency towing to bring the casualty to calmer waters or a safe haven.

Subsequent salvage actions may involve cargo and bunker transfer operations, diving operations, beaching the casualty or grounding it in shallow water and patching or filling holes. If a ship has grounded salvors may attempt to refloat it using tugs and perhaps by pressuring flooded tanks or compartments with air to increase buoyancy. In exceptional cases when the salvage of the ship is not practicable, the only way of minimizing pollution may be to tow it a long way offshore and sink it.

2.0 Emergency towing arrangements

Where there is a serious risk of harm to persons or property, or a significant risk of pollution, it may be necessary to initiate emergency towing arrangements. Such arrangements should be unambiguous, agreed by all parties where possible, and activated as swiftly as practicable. Standard operational procedures should apply irrespective of whether an Emergency Towing Vessel (ETV) is under charter to MSD, tasked from appropriate local harbour, industry or Area Controller's resources, or is a salvage tug of opportunity.

3.0 Emergency towing requirement – considerations

It is difficult to establish strict or prescriptive criteria for when to use an ETV. Individual circumstances must dictate the appropriate response.

4.0 Present emergency towing arrangements

Incident Commander holds comprehensive databases of tugs available locally and contact details. TTCG has operational instructions for CG DOO to activate a response from such vessels.

5.0 Agreements for Salvage and Towage (AST)

The Incident Commander has arrangements in place for emergency chartering of local tugs. For salvage "Lloyds Standard Form of Salvage Agreement" (LOF 1995) will be used, while for towing the "Standard Towage Conditions" as attached hereto will be used in the absence of any acceptable alternative provided by the tug owner. These agreements cover activation, contractual arrangements, liabilities and operational procedures, should Incident Commander request assistance from any local tug as part of the response to an incident. Some tugs may not be altogether suitable for emergency offshore towing. Weather conditions may restrict their use. Their role may therefore be to provide "first-aid" prior to the arrival of a more suitable vessel.

Any local tug tasked initially by TTCG or Incident Commander is de facto under contract. The MEEI must therefore fund it. Where necessary and appropriate, the MEEI will seek to recoup its costs.

The AST provide for any subsequent commercial agreements made between a shipowner and a tug operator to offset any potential cost to MOEEI for the initial charter of the tug.

6.0 Shelter for damaged ships

Except in the most severe incident, a ship is likely to retain some of its cargo and bunkers. It may be desirable to carry out a cargo and bunker transfer operation from the stricken ship to prevent or minimize further spills. It may help to move the ship to a more sheltered area such as a port or oil terminal.

It is safer to carry out cargo and bunker transfer operations in sheltered areas. However, the decision to use an area moves the risk of pollution to an area that the incident might otherwise not have affected. DMS considers carefully whether to use a sheltered area and, if so, which to select. DMS has in mind that time may be short and the damaged ship may not be in a condition to travel very far.

7.0 Emergency cargo and bunker transfer operations

The Incident Commander has access to emergency transfer equipment for use in off-loading oil or hazardous substances from a damaged or disabled ship. This ensures that there is suitable equipment available in Trinidad and Tobago for cargo and bunker transfer operations.

The equipment provides a total transfer capability, including pumps, power packs, hoses, fenders, communications equipment, protective clothing, breathing apparatus, and inert gas generators.

Incident Commander needs to lift equipment by air to the deck of a damaged ship, using NHSL helicopters (operational commitments permitting). When the Incident Commander uses NHSL units he consults the TTDF, through the COCG, about the most suitable airfield from which to lift equipment by air.

The Incident Commander provides details of the equipment to lift:

- Weights and dimensions of the equipment, especially of the heaviest item;
- The position of the casualty; and
- The estimated time of arrival of the equipment by road.

APPENDIX N – UNIT CONVERSIONS AND SLICK CALCULATIONS

Unit Conversions

Volume		
1 barrel (US)	42 gallons US	159 liters
1 barrel Imp	45.1 barrels Imp	205 liters
1 gallon Imp	1.2 gallons US	4.546 liters
1 cubic metre ³	1,000 liters	6.29 barrels US
1 liter	0.22 gallons	0.03531 ft ³
1 cubic yard ³	0.765 m ³	
1 ft ³	0.0283 gallons Imp	
1 decimeter ³	0.001 meters	1 liter
1 metric tonne	7.5 barrels	

Area		
1 Acre	0.405 hectares	4,050 m ²
1 Hectare	10,000 m ²	2.471 acres
1 km ²	100 hectares	247 acres
1 m ³	1.196 yard ²	
1 yard ²	0.836 m ²	9 ft ²
1 ft ²	0.0929 m ²	
1 mile ²	2.59 km ²	640 acres

Length/Distance		
1 km	0.54 nautical miles	0.622 mile
1 nautical mile	1.852 km	1.151 mile
1 mile	1.609 km	1,760 yard
1 m	1.094 yard	3.262 ft
1 yd	0.914 m	
1 foot	0.305 m	
1 inch	25.4 mm	
Speed		
1 knot	1.85 km/hour	0.51 metres/second
1 metre/second	3.6 km/hour	1.94 knots

Mass		
1 tonne (metric)	1000 kilograms	0.984 tons
1 ton (Imp)	20 hundredweight	1016.05 tonnes (metric)
1 hundredweight	50.8 kilogrammes	112 pounds
1 kilogram	2.205 pounds	1 litre of water
1 gram	0.035 ounces	

Flow		
1 cubic metre/hour	16.7 litres/minute	3.671 gallons/minute
1 litre/second	2.119 cubic feet/minute	13.21 gallons/minute
1 cubic foot/minute	0.1039 gallons/second	0.472 litres/second
1 gallon/minute	0.0631 litres/second	
1 barrel/hour	2.65 litres/minute	0.5825 gallons/minute
1 gallon (US)/acre	11.224 litres/hectare	

Pressure		
1 psi	0.069 bar	6.901 Pascal
1 bar	100 pascal	14.49 psi
1 bar	30 feet of water	

Temperature											
Celsius	0	10	20	30	40	50	60	70	80	90	100
Fahrenheit	32	50	68	86	104	122	140	158	176	194	212

°F to °C deduct 32, multiply by 5, divide by 9

°C to °F multiply by 9, divide by 5, add 32

Calculation/Quantification of Spilled Oil

An accurate assessment of the quantity of spilled oil is virtually impossible due to the difficulty in gauging its thickness. At best, the correct order of magnitude can be estimated by considering certain factors. Oil pollution is seldom uniform in either thickness or coverage, unless the contamination is very heavy.

Floating Oil

Oil spreads rapidly and most liquid oils will soon reach an average thickness of about 0.1 mm, characterized by a black or dark brown appearance. Similarly, the colour of sheen roughly indicates its thickness.

The following table is a guide to the relation between appearance, thickness and volume of floating oil:

Oil Type	Appearance	Approximate thickness (mm)	Approximate Volume (m³/km²)
Oil sheen	silvery	0.0001	0.1
Oil sheen	iridescent (rainbow)	0.0003	0.3
Crude and fuel oil	black/dark brown	0.1	100
Water-in-oil emulsions ('mousse')	brown/orange	> 1	> 1000

Note: 1 mm ~ 1/32 in.
1 m³ ~ 6.3 US bbls.
1 km² ~ 247 acres ~ 0.4 ml²

A reliable estimate of water content in a "mousse" is not possible without laboratory analysis but, accepting that figures of 50% to 80% are typical, approximate calculations of oil quantities can be made given that most typical floating "mousse" are 1 mm or more thick. However it should be emphasized that the thickness of "mousse" and other viscous oils is particularly difficult to gauge because of their limited spreading.

In order to estimate the amount of floating oil it is necessary not only to gauge thickness but also to determine the percentage area of the surface covered by oil, water-in-oil emulsion and sheen. Again, accurate estimates are complicated by the patching incidence of floating oil. To avoid distorted views, it is best to look vertically down on the oil when assessing its distribution. By estimating the percentage coverage of each form of oil, the area covered relative to the total surface area affected can be calculated.

Always bear in mind that although sheen may cover a relatively large area of water surface, it makes a negligible contribution to the volume of oil present. Hence, it is crucial to distinguish between sheen, thicker oil and emulsion.

Oil Spilled on Land

The appearance of oil spilled on land depends to a large extent on the type of soil, which can vary from rocky shores, through pebble and sand beaches, to clay or muddy land areas and wetlands.

Winds, waves and currents cause oil to be deposited on the coastline in streaks or patches rather than as a continuous cover.

The assessment of oil spilled anywhere on land is largely a visual one and will be impossible if the oil is effectively hidden from view for example, by penetration into the soil or by vegetation such as mangroves.

Quantifying oil spilled on land involves selected representative areas of contaminated soil for a calculation of the amount of oil present. The area chosen should be small enough to allow an accurate estimate of oil volume in a reasonable time, yet large enough to be representative of the whole section similarly affected. The exercise has to be repeated on other sections where the degree of oil coverage may be different. Quantifying spilled oil in this way only yields an approximate figure due to several inescapable sources of error.

Depending on the soil type, oil may soak into the substrate; or saturation/penetration may not be uniform. The presence of debris or stones and crevices can be an added complication, and when calculating oil volumes the occurrence of water-in-oil emulsions can be misleading. In some situations it may prove impracticable to use the relatively time consuming methods outlined above in which case it should always be possible to describe the degree of pollution as either light ($< 10 \text{ ml oil/m}^2$), moderate ($10 \text{ ml-1 litre oil/m}^2$) or heavy ($1-100 \text{ litres oil/m}^2$).