NATIONAL CONTINGENCY PLAN
FOR
RELEASE OF HYDROCARBONS
TO
THE ONSHORE AREAS
OF KENYA

Prepared for:
Ministry of Petroleum and Mining
Kenya Petroleum Technical Assistance Project (KEPTAP)

Prepared by:
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Acronyms

ALARP	As Low as Reasonably Practicable
AGO	Automotive Gas Oil
ATK	Aviation Turbine Kerosene
BLEVE	Boiling Liquid Expanding Vapor Explosion
BOPD	Barrels of Oil Per Day
CLC	Civil Liability Convention
CMS	Chip Measurement System
CSO	Civil Society Organization (NGO)
DG	Director General
DOSH	Directorate of Occupational Safety and Health
DRSRS	Department of Resource Surveys and Remote Sensing
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
EOC	Emergency Operations Center
EPRA	Energy and Petroleum Regulatory Authority
ERC	Energy Regulatory Commission, former name of the Energy and Petroleum Regulatory Authority (EPRA)
ERP	Emergency Response Plan
ESI	Environmental Sensitivity Index
ETA	Event Tree Analysis
EUL	Environmental Unit Leader
FMEA	Failure Mode and Effect Analysis
FTA	Fault Tree Analysis
GC/MS	Gas Chromatography/Mass Spectroscopy

GHS	Globally Harmonized System
GIS	Geographic Information System
HAZID	Hazard Identification Study
HAZOP	Hazard and Operability Study
HFE	Human Factors Engineering
HNS	Hazardous and Noxious Substance
IAG	Inter-Agency Agreement
IAP	Incident Action Plan
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IDLH	Immediate Danger to Life and Health
IDO	Industrial Diesel Oil
IMS	Incident Management System
IOGP	International Association of Oil and Gas Producers
IPIECA	International Petroleum Industry Environmental Conservation Association
IMT	Incident Management Team
ISB	In Situ Burning
JIC	Joint Information Center
KCGS	Kenya Coast Guard Service
KEPTAP	Kenya Petroleum Technical Assistance Project
KFS	Kenya Fisheries Service
KMA	Kenya Maritime Authority
KMFRI	Kenya Marine and Fisheries Research Institute
KOJ	Kisumu Oil Jetty

KPA	Kenya Ports Authority
KPC	Kenya Pipeline Company
KPRL	Kenya Petroleum Refineries Ltd.
KWS	Kenya Wildlife Services
LEL	Lower Exposure Limit
LPG	Liquefied Petroleum Gas
LTI	Lost Work Days
LVBC	Lake Victoria Basin Commission (LVBC)
MAR	Major Accident Risk
MNCP	(Draft) Marine National Oil Spill Contingency Plan
MOD	Ministry of Defense
MOU	Memorandum of Understanding
MSSP	Ministry of State for Special Programs
NCP	National Contingency Plan
NDOC	National Disaster Operation Centre
NDRP	National Disaster Response Plan
NEBA	Net Environmental Benefit Analysis
NEMA	National Environment Management Authority
NFPA	National Fire Protection Association
NMK	National Museums of Kenya
NOC	National Oil Corporation of Kenya
NOSCP	National Oil Spill Contingency Plan
O&G	Oil and Gas
OC	On-Scene Commander
ORT	Onsite Response Team

OSCP	Oil Spill Contingency Plan
OSHA	United States Occupational Safety and Safety Administration
OSMAG	Oil Spill Mutual Aid Group
OSO	Onsite Safety Officer
OSR	Oil Spill Response
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Response Organization
OSRP	Oil Spill Response Plan
PEL	Permissible Exposure Limit
PIO	Public Information Officer
PMS	Premium Motor Spirit (gasoline)
PPE	Personal Protective Equipment
QRA	Quantitative Risk Assessment
R&RD	Relief and Rehabilitation Department
RA&M	Risk Assessment and Management
REL	Recommended Exposure Limit
RP	Responsible Party
RTC	Risk Tolerability Criteria
SCAT	Shoreline Clean-up Assessment Technique
SDS	Safety Data Sheet
SIMA	Spill Impact Mitigation Assessment
SO	Safety Officer
SRP	Spill Response Plan
STEL	Short Term Exposure Limit
UC	Unified Command

UEL	Upper Exposure Limit
UHF/VHF	Ultra-High Frequency/Very High Frequency (radio)

Plan Revision Log

Date	Revision	Comments
August, 2019	0	Plan development through the Technical Committee with Polaris Applied Sciences, Inc.
December, 2019	0.1	Comments and edits suggested by the Technical Committee addressed by Polaris Applied Sciences, Inc.
January, 2020	0.2	Final version to be presented to stakeholders and implemented in 2020
December, 2020	1	Revised post-stakeholder reviews (Aug.-Dec. 2020)

Plan Distribution List

Agency / Company	Location	Number of Copies
Kenya Maritime Authority		
Kenya National Disaster Operation Centre		
Kenya National Environmental Management Authority		
Ministry of Energy and Petroleum		
The World Bank Group		

QUICK GUIDE FOR INITIAL RESPONSE

Required Notifications [Section 2.2 Notifications]

Any actual or probable hydrocarbon releases (including any incident with the potential to become a spill) of petroleum into the environment should be reported to the NEMA Incident Line.

Dial NEMA

Incident Line to report a spill:

0786-101100 or 0741 101 100

Initial Response [see Section 2.1 Initial Response]

☑ **Any operator / person observing a spill should take the following emergency actions after conducting a quick assessment of the situation:**

- ❑ Activate the RP's emergency or spill response plan and Tier 1 response resources
- ❑ Ensure safety of people in the area.
- ❑ Stop flow at the source, if safe to do so.
- ❑ Eliminate sources of ignition if spill is flammable.
- ❑ NEMA Emergency Numbers: **0786-101100 or 0741 101 100**
  - ❑ VHF 12
- ❑ Contain spill if safe to do so.

☑ **First responders should initiate the following actions:**

- ❑ Evacuate area as necessary and confirm that injured persons, if any, have been treated.
- ❑ Confirm identification of spilled material and check the Safety Data Sheets (SDS) emergency procedures.
- ❑ Confirm that personnel have been assigned to stop the flow of spilling product and secure leaks if it can be done safely.
- ❑ Assess the spill threat, site safety, and parameters such as spill volume, extent and direction of movement.
- ❑ Establish Exclusion Zone and Safe Work Areas.
- ❑ Initiate actions to contain the spill.

WARNING: **Do not contain gasoline or jet fuel spills on water due to potential fire and explosion hazards.**

- ☐ Complete notifications for emergency call-out (also in Section 2.2).
- ☐ Initiate protection strategies for priority sensitive sites at risk from the release or spill.

Initial Assessment and Notification Check List

The following information should be collected for all spills reported:

- ☐ location (e.g. latitude and longitude or position relative to coastline, road, community, etc.);
- ☐ name of person reporting incident;
- ☐ telephone number, e-mail address, or other means of contact with person reporting;
- ☐ date and time of observation;
- ☐ details of observation;
- ☐ source and cause of pollution (e.g. name and type of truck, pipeline, storage facility);
- ☐ type and estimated quantity of oil spilled and the potential and probability of further pollution;
- ☐ weather and local (nearby communities, river, onlookers, wildlife) conditions; and
- ☐ actions taken or intended to respond to the incident.

Do not hesitate to provide initial notification even if all information has not been assessed.

See Appendix B – See Appendix B.1 for the initial spill report form.

Next Steps

- ☐ Continue on-scene assessment of magnitude of incident (Section 6)
- ☐ Establish tracking and monitoring (Section 7)
- ☐ Maintain or expand safety perimeter as appropriate (section 2.3).
- ☐ Expand and assign responsibilities to On-Scene Response Team (see Section 5)
- ☐ Assess needs for additional response personnel and equipment - request and mobilize.
- ☐ Complete internal and external notifications, as appropriate to situation per the RP's ERP
- ☐ Forecast changes in situation (spilled or released material, weather, resources at risk)
- ☐ Establish Command (IC or UC, as appropriate) and Incident Response Management structure appropriate to response (see Section 5)
- ☐ Develop Incident-specific Action Plan
  - o Develop Site-specific Safety Plan
  - o Develop communications plan
  - o Establish decontamination site(s) and waste management sites
  - o Implement appropriate response strategies and tactics

Contents

1 Introduction

1.1 Purpose and Scope

The purpose of this National Contingency Plan for Release of Hydrocarbons to the Onshore Areas of Kenya (Onshore-NCP) is to delineate responsibilities for preparing for and responding to any significant spill on land or to non-navigable waters of the country. This Onshore-NCP is applicable to all of the Kenya territory where a hydrocarbon release could occur, with the exception of marine and navigable waters as those areas are under the Marine and Navigable Waters NCP. Both Plans are part of the national framework for hydrocarbon escape prevention, preparedness and response capacity. Other elements of the national spill emergency response framework include the coastal sensitivity atlas, a national guide for using the shoreline clean-up assessment technique (SCAT), and a national guide for oiled wildlife response and preparedness. This Onshore-NCP is designed to provide the members of the National Incident Management Team (National-IMT) with the information needed to respond to spills of national significance in a safe, rapid, effective, and efficient manner. The National Environmental Management Authority (NEMA) is the lead agency coordinating onshore spills, and thus for the activation of this Onshore-NCP.

The national framework for hydrocarbon release prevention, preparedness and response capacity uses the term “hydrocarbon” to refer to crude oil, natural gas, and any product derived from the fractional distillation and refining of crude oil (both liquid and gas phase), and the term “oil” to refer to liquid hydrocarbons. Figure 1-1 shows some of the hydrocarbons that can be extracted from crude oil covered by this NCP.

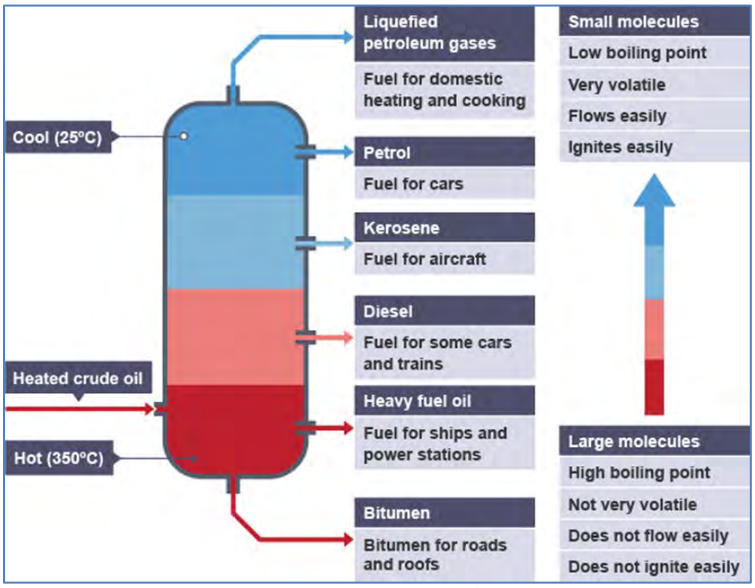

Figure 1-1 Examples of hydrocarbons, extracted from crude oil. Source: https://www.bbc.co.uk/

Emergency management principles in this NCP apply to any type of petroleum hydrocarbon or oil regardless of its chemical and physical characteristics. Due to their potential persistence, clean-up procedures are focused on liquid oil spills.

All refined oil products handled in the country may be listed as hazardous and noxious substances (HNS). This NCP applies to any type of hydrocarbon release handled in Kenya in any sector of the oil and gas industry, including upstream, midstream, and downstream.

The central objective of all countermeasure operations during a spill emergency response is to ensure human safety and health and to minimize the threat to ecological and socio-economic receptors at risk. Procedures in this Plan are intended to guide local, national, and regional co-operation regarding prevention, contingency planning, spill source control, clean up, and cost recovery.

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

a) establishes spill assessment, notification, and reporting systems;
b) identifies the chain of command and related responsibilities, including the competent national authority and the national oil spill response organization;

c) describes the concept of tiered response capability (and the process for escalating from local to national level when necessary);
d) identifies high spill risk areas and likely sources of oil spills;
e) identifies environmentally sensitive areas, vulnerable resources at risk, and priorities for protection;
f) identifies oil spill equipment, logistical support facilities, and communication capabilities available within Kenya for environmental emergency response;
g) identifies external sources of expert advice and equipment for spill response and establishes procedures for entry into and departure from Kenya for international resources mobilized for response;
h) explains response techniques for on-water and river bank intervention;
i) identifies storage facilities for recovered oil as well as disposal methods;
j) establishes policies for use of chemical dispersants and in-situ burning as spill countermeasures;
k) establishes policies for use of volunteers, health and safety, and wildlife response;
l) establishes a spill response training and exercise program;
m) establishes guidance for cost tracking, monitoring, and recovery; and
n) provides spill response guidance for local governments and the Responsible Party (RP).

This plan provides a framework for NEMA, relevant Kenya government agencies, and the oil industry to use when responding to onshore hydrocarbon release emergencies that may occur; this includes spills on land and or to, or reaching, small rivers and lakes, and other non-navigable waters of the country. The circumstances under which NEMA activates Kenya's national assets to respond to a spill incident, as well as how NEMA oversees the management of these resources, are also described in this Onshore-NCP.

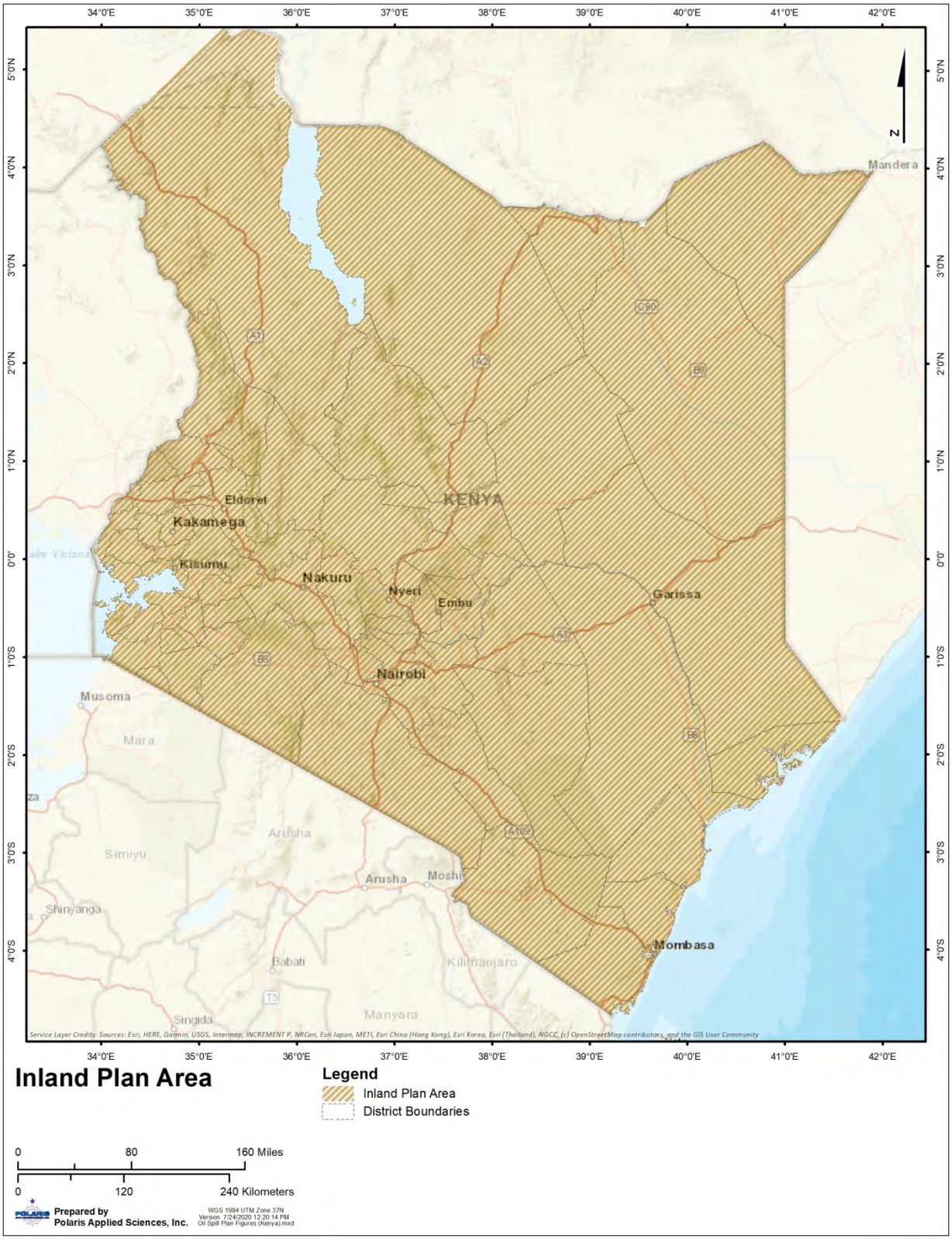

Figure 1-2 Geographic area encompassed by the Onshore-NCP, which includes the onshore non-navigable waters of Kenya.

1.2 Competent National Authority and Pertinent Laws

This Onshore-NCP has been developed by NEMA, in coordination with KMA, the National Disaster Operation Centre (NDOC), and other key stakeholders. NEMA is mandated with responding to environmental issues anywhere in the Kenya (EMCA, 1999; Amendments 2015), while KMA is mandated with responding to spills to the Kenya marine environment (Section 3 of the KMA Act, Cap 370). To address this obligation, NEMA has been designated as the 'competent oil spill authority' and the lead agency for the activation and implementation of this Onshore-NCP. This NEMA responsibility includes leading the strategic technical planning and management of a spill of national significance and collaborating with other agencies and stakeholders as necessary, including the responsible party.

Other supporting legislation includes:

- The Constitution of Kenya, 2010
  - Article 42 declares that the people of Kenya have a right to a clean and healthy environment; have a duty to protect and conserve the environment; and to ensure ecologically sustainable development and use of natural resources (Section 2, Chapter 5).
  - Article 70 deals with enforcement of environmental rights; anyone who feels their right to a clean and healthy environment has been denied has the obligation to go to court to seek redress.
  - Section 63 states that any unregistered community land shall be held in trust by county governments on behalf of the communities for which it is held.
- The Environmental Management and Coordination Act (EMCA), 1999 (Amendments 2015)
  - The principal law governing environmental protection in Kenya; identifies NEMA as the authority to address and respond to environmental issues
  - Provides regulations on environmental conservation and management; confers the right of every person to a clean environment, makes a clean working environment mandatory, and protects people living close to any potential spill site.
  - Prohibits anyone from discharging or applying poisonous, toxic, noxious, radioactive, or any other pollutants or obstructing matter into aquatic environment.
  - Prohibits discharge or disposal of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or impact public health.
  - Sections 90 through 100 outline additional regulations on managing hazardous and toxic substances, chemicals and pesticides.
- The Marine Pollution Bill, 2014 (Section 180)
  - Confers upon KMA the responsibility for oil pollution preparedness and response in Kenya; see Marine and Navigable Waters-NCP.
- National Policy for Disaster Management in Kenya (Chapter 3)

  - Describes the lead role of government in the strategic planning and management of disasters, including oil spills of national significance.
  - .
- Environmental Management and Coordination Regulations, 2006 (Cap. 387) (Toxic and Hazardous Industrial Chemicals and Materials Management)
  - Requires all polluters to report the incident to the relevant emergency response authority (KMA for this Onshore-NCP). EMCA also requires NEMA to be notified of any discharged pollutant, including accurate information about the quantity and quality of the effluent; see Section 2.2.3 for Notification Procedures.
  - Requires all polluters to respond, manage, and mitigate the chemical or material incident to protect human health and environment and to perform any other actions as directed by NEMA, including addressing the costs of mitigation.
  - Requires the incident responder to ensure that adequate safety precautions, use of appropriate personal protective equipment and reliance on relevant emergency response guidelines / procedures are used during the response.
  - NEMA shall take appropriate measures (see Section 1.3.4) to respond, manage, and mitigate chemical releases at all stages of the risk management cycle.
- Environmental Management and Coordination Regulations, 2006 (water quality) Regulations, 2006
  - Provides for the protection of lakes, rivers, streams, springs, wells and other water sources.
  - Addresses pollution of water resources as well as their conservation.
- Environmental Management and Coordination Regulations, 2006 (Waste Management)
  - Focuses on management of solid wastes, industrial wastes, hazardous wastes, pesticides, toxic substances and radioactive substances.
  - Provides standards for handling, transporting, and disposing of different types of waste; addresses concerns such as responsibility for waste generators and obligations for disposal.
  - Prohibits disposal of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.
  - Requires that any person waste to be collecting, segregating, and disposing of waste be licensed by NEMA.
- EMCA (Controlled Substances) Regulations, 2007
  - Controls the exports and imports of controlled/toxic substances (e.g., dispersants).
- Occupation Health and Safety Act, 2007
  - Provides for the safety, health and welfare of workers (including spill clean-up crew members) and all persons lawfully present at workplaces, in all phases of a response.
  - Prohibits any persons from engaging in improper activity or work place behaviour which may create or constitute a hazard to that person or any other person.
  - Gives power to the occupational safety and health officer to enter, inspect, and examine, at any time, a workplace.

- Public Health Act Cap 242
  - Provides for securing and maintaining health, including notification of any public health hazard.
- National Museums and Heritage Act Cap 216
  - Empowers the National Museums of Kenya to take a lead role in research, development, protection, and management of cultural and heritage resources.
- Wildlife Conservation and Management Act, 2013
  - Prohibits activities that are likely to have adverse effects on wildlife.
  - Lists various animals and tree species that are nationally considered as critically endangered, vulnerable, nearly threatened and protected species.
- Petroleum Act, 2019 (Sections 97, 127jj)
  - Includes clean-up and response preparedness responsibilities for Midstream and Downstream operations.
  - Includes co-ordination of contractor safety, emergency preparedness and evacuation procedures, and suspension of upstream petroleum operations.
- Energy Act, 2019
  - Establishes the Midstream and Downstream licensee's liability for any loss, damage or injury to any environmental resource resulting from the licensee's works or operations, whether as a result of negligence or otherwise.
- Meteorology Bill, 2019
  - Enables the Kenya National Meteorological Authority to provide meteorological services and maintain up to date collection of weather and climate data.

1.3 Responsibility for Onshore Incidents

The Responsible Party (RP) is liable for all damages and response costs associated with a hydrocarbons release (e.g., a spill of crude oil or HNS) that impacts environmental or socio-economic resources per the Environmental Management and Coordination Act (EMCA). The RP is required to report any discharge to the response and environmental authority (NEMA). The RP is also required to take immediate action to contain the spill and initiate clean-up and recovery operations, as well as monitoring and rehabilitation, to the satisfaction of NEMA.

Containment, clean-up and recovery activities undertaken by the RP will be monitored by the NEMA and must conform to their standards and requirements. Containment, clean-up and recovery activities, and rehabilitation will be in accordance with response policy and priorities of this Onshore-NCP.

In the event that the RP is unable or unwilling to carry out these functions, the Government of Kenya will respond at the polluter's expense. If the Government of Kenya assumes responsibility for spill clean-up, the polluter will be notified of the activation of this Onshore-NCP (a sample Letter of NCP Activation is provided in **Appendix B** – Forms 3 and 4), and a National-IMT led by NEMA will undertake incident management. Specific roles and responsibilities of the command and general staff positions of the

National-IMT are described in Section 5 (Response Management Organization), and with further detail in **Appendix H**.

1.3.1 National Hydrocarbon Release Contingency Plan Working Group

The NEMA shall create and lead an Onshore-NCP Working Group comprised of experts drawn from the relevant government agencies and organizations (e.g., KPL, KMA, NEMA, NDOC, EPRA, Kenya Meteorological Department, expert consultants and other stakeholder organizations) and onshore oil and gas (O&G) companies. Specific participation of stakeholder groups, agencies and organizations will be defined by NEMA based on specific needs and actions required.

The activities of the Onshore-NCP Working Group are coordinated by the NEMA Director General and include:

a) supporting the NEMA Director General on all technical responsibilities related to this NCP,
b) maintaining this NCP, and
c) performing annual audits of the Plan.

NEMA should coordinate with KMA to ensure alignment between the Onshore-NCP and the Marine-NCP Working Groups

1.3.2 Functions of the NEMA Director General

The NEMA Director General (DG) is responsible for distributing copies of this NCP to relevant organizations t and stakeholders, as appropriate, and for coordinating all NCP maintenance activities (Section 1.5).Additional duties of the NEMA DG in maintaining this NCP include but are not limited to:

a) Ensuring that the recipients of the Plan are fully conversant with its contents and are aware of their individual responsibilities within the Plan;
b) Ensuring that contact names and addresses are current;
c) Ensuring that manpower/equipment inventory is current;
d) Conducting regular reviews of scenarios, response strategies, and new technologies in conjunction with the responders;
e) Amending the Plan after each exercise, if and as necessary, and ensuring that lessons learned are implemented;
f) Ensuring that sensitive area data is updated;
g) Overseeing training within the context of the Plan;
h) Organizing appropriate resources to accomplish the above tasks; and
i) Liaising with stakeholders for relevant information.

During the activation of this Onshore-NCP, the NEMA DG, reporting to the NEMA Board of Directors, is responsible for:

- overall management of emergency response operations, as applicable to this NCP,

- ensuring operations are carried out safely, effectively, and efficiently, and
- serving as the primary National-IMT contact person for DGs and Board of Directors.

To address these responsibilities the NEMA DG could either serve as the National-IMT Incident Commander (IC) or delegate the IC function to a Deputy-DG and assume the function of a Board of Directors-Liaison with the National-IMT; all IMT functions, roles, and responsibilities are described in Section 5 of this NCP.

1.3.3 Functions of the National Environment Management Authority (NEMA)

In addition of being the lead agency for the development, maintenance and implementation of this Onshore-NCP, the principal law governing environmental protection in Kenya (EMCA) identifies NEMA as the authority to address and respond to environmental issues.

In the event of a hydrocarbon release where the RP is unable or unwilling to carry out the Environmental Unit functions effectively (as described in Section 5 of this Onshore-NCP), NEMA will assume any technical role in the Environmental Unit of the National-IMT (even though liability will always remain on the polluter), and activate this Onshore-NCP if necessary.

1.3.4 Functions of the National Disaster Operation Centre (NDOC)

Hydrocarbon release incidents may require shelter in place, evacuation, activating a provincial or district emergency operation centre, and other disaster-management functions for which Ministry of State for Special Programmes (MSSP) and NDOC have primary coordination responsibilities according to the National Disaster Response Plan. That plan could be activated as the framework for disaster management function while this NCP will provide the framework for tactical response operations to the hydrocarbon release emergency.

In the event a hydrocarbon release in onshore territory is classified as a disaster, per the National Policy for Disaster Management in Kenya, NEMA as the lead agency can enlist NDOC support for logistical functions (such as security, community engagement and protection) or any other National-IMT role as described in this NCP; see Section 5.

1.3.5 Functions of the Energy and Petroleum Regulatory Authority (EPRA)

EPRA has a critical role in ensuring spill prevention, preparedness and response capabilities are in place prior to approval (or renewal) of the operating license of any potential polluter.

1.3.6 Functions of the Kenya Port Authority (KPA)

Onshore spills (e.g., pipelines, truck-tank accidents) could impact port operations, in which case a Unified Command between the lead agency (NEMA) and the KPA will be established. Consistent with the KPA oil spill contingency plan, KPA has an obligation to plan, resource, and respond to all oil spills that occur within the harbour waters and port limits, including spills that occur outside port limits but may impact port operations. NEMA may request KPA (and KMA if required) assistance for spills of national significance, including requesting the Port Authority's Harbour Master to establish (or retain) command

and control of on water counter pollution measures, as the On-Scene Commander in charge of the Onsite Response Team (ORT).

1.3.7 Functions of the other organizations in the distribution list

The organizations in the distribution list, including all county governments and other stakeholders, shall upon receipt of this NCP:

a) Review responsibilities in spill response (Section 5)
b) Ensure that this NCP is updated and readily accessible and ensure that all revisions are appropriately filed;
c) Study all new material issued and incorporate the same in their work practice;
d) Suggest changes to NEMA and KMA and contribute new material to improve the quality of the Plan; and
e) Disseminate information contained in revisions to the relevant personnel.

1.4 Relationship to Other Plans

This Onshore-NCP complements any crude oil and HNS onshore hydrocarbon release emergency response plans (ERPs) in Kenya and enables coordination with national and county governments, neighbouring countries, and wider international support networks and plans. All applicable ERPs shall incorporate a section indicating the relationship between the specific plan owners' ERP and this NCP.

Note:
There are no international emergency response agreements currently established for onshore spills.

1.4.1 Local Plans

All potential polluters, including but not limited to oil operators and any other companies that import, export, or transport petroleum products into or out of the country shall have at least a Tier 1 ERP. All Tier 1 ERPs should indicate escalation procedures (into Tiers 2 and 3) consistent with the activation of this NCP.

The Kenya Port Authority and response organizations such as the Oil Spill Mutual Aid Group (OSMAG) Society shall also maintain a Tier 2 oil spill ERP, showing integration of resources into a unified response.

Oil companies must demonstrate in-country capability to respond to a Tier 1 incident with their own or directly contracted resources (personnel and equipment), to Tier 2 spill incidents either directly or via affiliation to a competent Tier 2 response organization in Kenya (e.g., the OSMAG Society), and when applicable (high risk potential polluters - See Section 3) to Tier 3 through access to international spill response resources (e.g., Oil Spill Response Limited or OSRL).

This Onshore-NCP is intended to integrate with and support local facility and terminal plans (e.g., KPC, Project Oil Kenya plans), as needed, for Tier 2 or 3 events (Figure 1-2).

All operators involved with the transport or handling of hydrocarbons or other potentially dangerous substances in bulk (such as, but not limited to storage facilities, terminals, pipelines, railroads) must submit a hydrocarbon release emergency response plan (ERP) or oil spill contingency plan (OSCP) to NEMA prior to the start of any operation(s) (see Appendix E for minimum planning requirements). Prior to NEMA approval, any local OSCP must:

a) company's (and any associated response organization) minimum level of trained emergency response personnel and equipment (Tier 1),
b) structure of Emergency Response Organization,
c) describe activation of the company's response system,
d) company's training and exercises program or requirements, and
e) provide a declaration or copy of insurance certificates.

Any change to the content mentioned above is considered strategic in nature and must be submitted within 30 days to the NEMA for approval. Any other change is considered tactical or editorial and must be communicated to NEMA before the new year for any updates thereafter.

Local Oil Spill Response Plans (OSRPs), (e.g., KPC, County Plans), should be consistent and coordinated with this Onshore-NCP. A Local OSRP could be focused on a county- (or facility location-) specific spill risks, sensitive environmental and socio-economic resources, and the appropriate response strategies. Local OSRPs should indicate escalation procedures including the incorporation of national resources through the activation of this NCP.

Any facility-specific OSRP should follow its company response principles and criteria (e.g., KPC Global ERP, Tullow or any O&G company Corporate ERP) and be aligned with the appropriate County ERP and with this Onshore-NCP; see Figure 1.2.

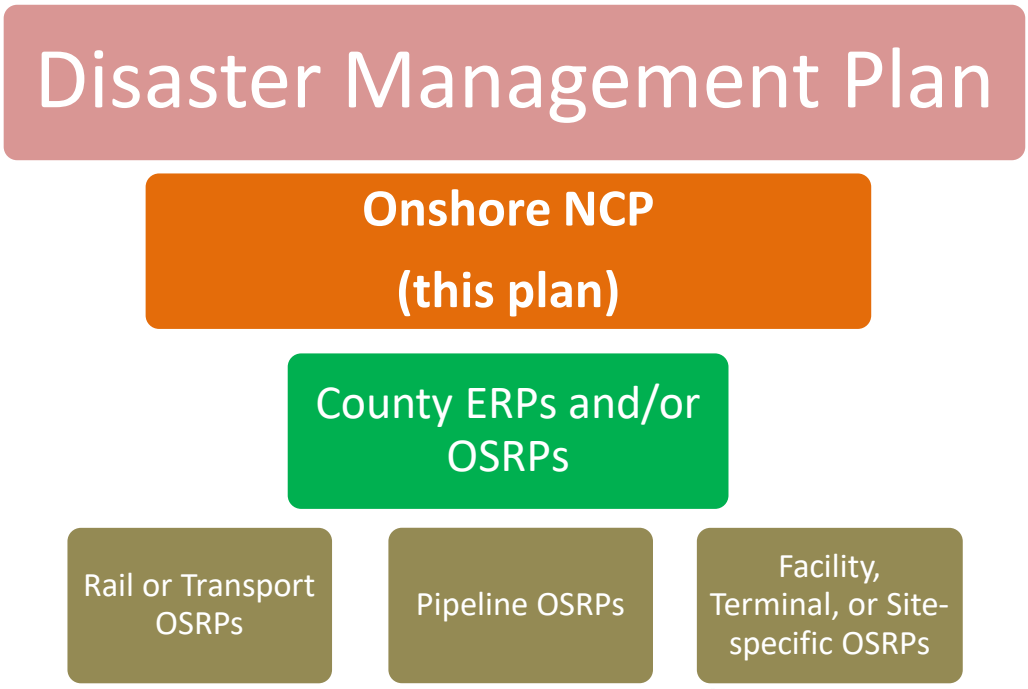

Figure 1-3 Examples of emergency plans for hydrocarbon release response and their relationship with this NCP. See Section 5.1 for further information on the levels of response organization

1.5 Plan Review and Revision

Responsibility for development, update, review, and amending of this Onshore-NCP lies with the NEMA in consultation with KMA; in order to ensure alignment with the Marine-NCP. The Plan will be reviewed annually and updated, as appropriate, based on experiences from actual incidents, drills, and simulation exercises. The Plan will be kept current whenever changes to key agencies, applicable laws, major emergency response resources, and/or personnel are made. The Plan shall also be revised based on substantial changes in the oil exploration, production, or handling operations within the country, spill hazards/threats, as well as changes in technology adopted for spill response.

No revisions to this NCP are to be made unless these are made through the Plan Custodian (NEMA DG), who will then ensure that the revised Onshore-NCP is distributed to all plan holders. Updates to the Onshore-NCP will be distributed to plan holders as sequentially numbered revisions, to be tracked on the Revision Log in the Preface to this plan. The footer on revised pages shall show the date of the last revision made. Upon receiving an update, the plan holder should dispose of the superseded sheet(s) and promptly replace them with the new issue.

Contents

2 Initial Response, Notifications, and Reporting

A rapid, appropriately sized response to an oil spill incident can greatly reduce the volume spilled and/or mitigate the impacts of the spill to the environment, economy, and public trust. Furthermore, quick notification of a pollution incident is required of any Responsible Party (RP). Failure of a spiller to report a pollution incident is considered an offence and is subject to fine and possible imprisonment.

2.1 Initial Response

☑ **Any operator / person observing a spill should take the following emergency actions after conducting a quick assessment of the situation:**

- ❑ Activate the RP's emergency or spill response plan and Tier 1 response resources
- ❑ Ensure safety of people in the area.
- ❑ Stop flow at the source, if safe to do so.
- ❑ Eliminate sources of ignition if spill is flammable.
- ❑ NEMA Emergency Numbers: **0786-101100 or 0741 101 100**
  - ❑ VHF 12
- ❑ Contain spill if safe to do so.

☑ **First responders should initiate the following actions:**

- ❑ Evacuate area as necessary and confirm that injured persons, if any, have been treated.
- ❑ Confirm identification of spilled material and check the Safety Data Sheets (SDS) emergency procedures.
- ❑ Confirm that personnel have been assigned to stop the flow of spilling product and secure leaks if it can be done safely.
- ❑ Assess the spill threat, site safety, and parameters such as spill volume, extent and direction of movement.
- ❑ Establish Exclusion Zone and Safe Work Areas.
- ❑ Initiate actions to contain the spill.

  WARNING: **Do not contain gasoline or jet fuel spills on water due to potential fire and explosion hazards.**

- ❑ Complete notifications for emergency call-out as indicated below.

2.2 Notifications

For the purpose of maintaining a simple and streamlined process, **all actual or probable hydrocarbon releases (including any incident with the potential to become a spill) of petroleum into the environment should be reported to the NEMA Incident Line.** NEMA will receive and disseminate such notifications or reports, as appropriate, to internal and external interests following notification procedures outlined in Section 2.2.3.

Dial NEMA

Incident Line to report a spill:

0786-101100 or 0741 101 100

Notification and reporting content include, to the extent practical, the following information (See Appendix B.1, Initial Notification Form):

- location (e.g. latitude and longitude or position relative to closest city, pipeline station, road, community, etc.);
- name of person reporting incident;
- telephone number, e-mail address, or other means of contact with person reporting;
- date and time of observation;
- details of observation;
- source and cause of pollution (e.g. name and type of facility, type of truck);

- type and estimated quantity of material spilled and the potential and probability of further pollution;
- weather and local (river, onlookers, wildlife) conditions; and
- actions taken or intended to respond to the incident.

The NEMA Incident Line On-Duty Operator will notify members of the Incident Management Team (IMT), including Government Departments depending on the nature and magnitude of the incident.

2.2.1 Spills to Land and Onshore Non-Navigable Waters

Any member of the public who sees a discharge of oil or other hazardous materials on land or to onshore waters, such as rivers and streams, should report the situation to the NEMA Incident Line where designated NEMA duty officers are on-call 24 hours.

Supervisors, persons in charge, or any or other observers at the oil and gas facility, should report without delay any sightings of oil on land (out of the facility secondary containment) or on the surface of any non-navigable body of water in Kenya.

Inside a Port area, the observer should notify immediately the Kenya Port Authority (KPA).

An aircraft pilots seeing a spill should report observations to the Air Traffic Control Tower, who would then notify the NEMA Incident Line.

2.2.2 Notification Procedure

The spill notification flow diagram (Figure 2-1) shows the preferred call-out sequence. The spill observer only needs to make one call to report the spill, triggering the remaining call-out sequence. The first call from the spill observer should be to the NEMA Incident Line to report a spill, unless the spill occurs inside the Port area, in which case the first call should be to the KPA. Figure 2-1 also shows the communication priorities for each function; for example, upon receiving notification from the spill observer, the NEMA Incident Line operator should communicate first (1st call) to the On-Duty Incident Commander and then (2nd call) to the On-Duty National IMT members.

2.3 Initial Tactical Response

The initial tactical response, to be implemented by any Onsite Response Team (ORT) at an incident scene, consists of four sets of activities: Site Command and Control (Section 2.3.1), Safety and Hazard Assessment (Section 2.3.2), Site Management (Section 2.3.3), and Communications at the Incident Scene (Section 2.3.4). If the incident severity or the complexity of the response operations escalate, an IMT may be required to manage the incident and provide support to the ORT.

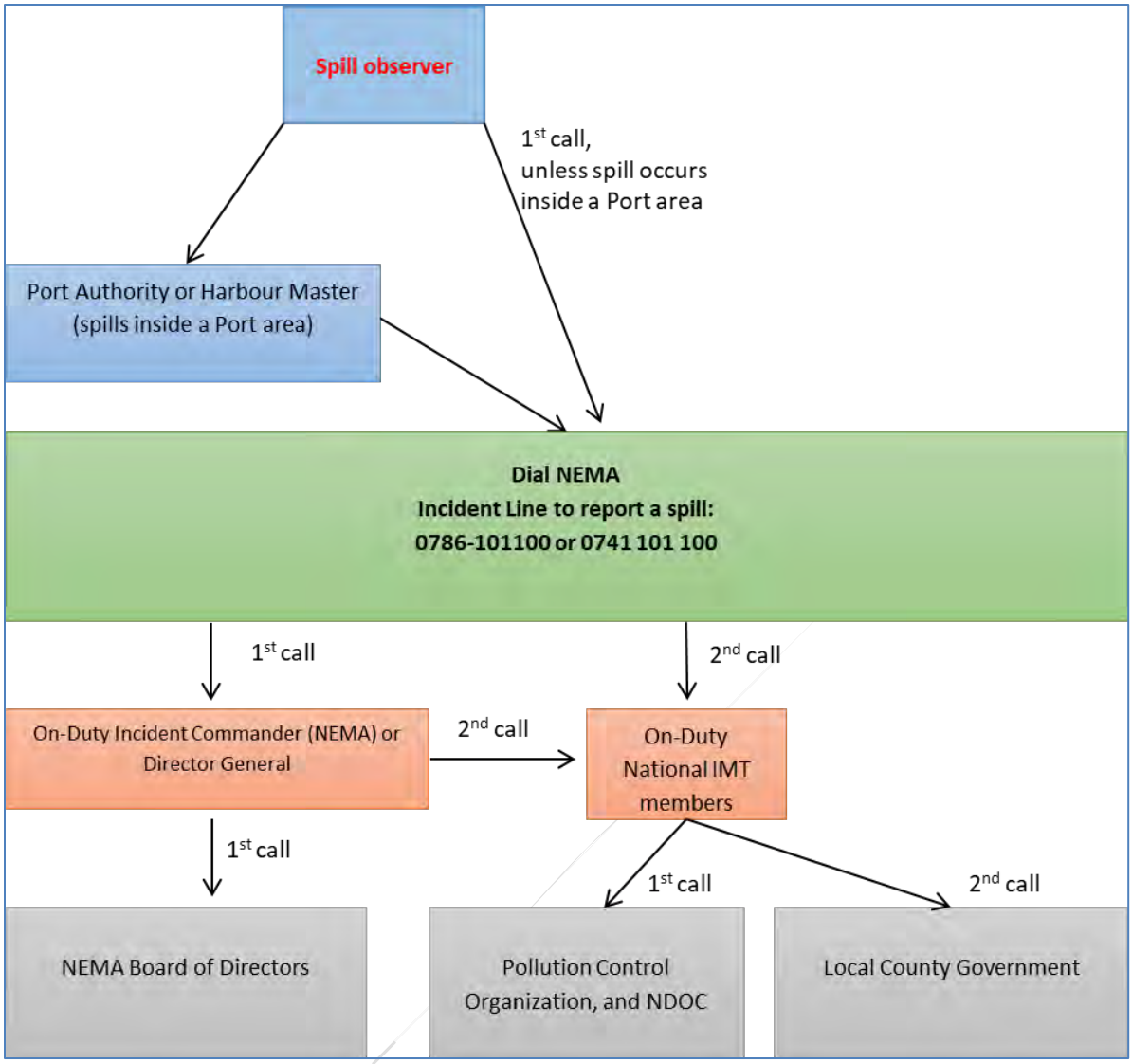

Figure 2-1 Spill Notification Flow Diagram to activate this Onshore-NCP

2.3.1 Site Command and Control

Any potential RP or polluter, or NEMA as the lead agency, should have a designated ORT capable of establishing:

- a command structure at the incident scene led by one On-scene Commander,
- control over the incident scene by separating responders from non-responders (see Isolation and Evacuation in Section 2.3.2.2), and
- control over the resources brought or sent to the incident scene by establishing at least one Staging Area.

2.3.2 Safety and Hazard Assessment

The health and safety of all spill responders and any person that could be affected by a hydrocarbon release are prime considerations during an incident response. Safety issues can be more complex than those during regular industry duties. There are specific chemical hazards related with hydrocarbons and physical and specific occupational hazards associated with an oil (crude oil and HNS) spill response; as an example, oil spill response involves operations where personnel can potentially be exposed to petroleum vapours and flammable hazards. Any ORT is required to have an onsite safety officer in charge of implementing an incident-specific Safety Plan.

2.3.3 Onsite Safety Officer (OSO) and Safety Officer (SO)

An Onsite Safety Officer (in an ORT) and Safety Officer (in an IMT), as assigned to spill response under Position Descriptions (see Section 5.5), must ensure safeguards are in place to protect the public and that responders understand the hazards associated with response and the mitigation measures to minimize those risks. The OSO/SO is responsible for creating an incident-specific Safety Plan that includes:

- toxicology information of the spilt oil or HNS
- fire and explosion hazards / risks
- operations safety guidelines
- personal protective equipment
- site security procedures
- personnel safety responsibilities
- emergency support (ambulance, medical)
- Identify safety zones in the isolated response areas:
    - Clean zone or safe zone for any responder (Cold Zone)
    - Contamination reduction zone (Warm Zone)
    - Contaminated Zone (Hot Zone)

The Safety Officer will provide direction with respect to the safety measures and use of suitable personal protective equipment for the different component tasks from a response operation.

Companies undertaking Tier 1 response are expected to follow all safety and health requirements of the Directorate of Occupational Safety and Health Services (DOSHS) for oil spill clean-up workers and those defined in their Tier 1-Spill Response Plan. The designated Safety Officer for the Tier 1 response organization at the site is responsible for the health and safety program during initial spill response.

The Safety Officer will develop an incident specific safety and health plan for the initial emergency response phase. **An initial site characterization using the Site Safety and Control Analysis Form (Appendix B - Forms)** will be the first step. Safety data sheets for substances that might be spilled and for spill treating chemicals (e.g., dispersants, surface washing agents, biodegradation agents) should be readily available to all responders. These will be used together with other information sources to determine the nature and potential hazards of the spilled material.

2.3.3.1 Safety Assessment

Initial steps in site safety assessment are:

Isolation & Evacuation —

For safety purposes, an isolation perimeter is established to keep non-responders safely out of the area around a hydrocarbon release site, where only trained responders should be allowed. All personnel should be evacuated from the area within the isolation perimeter, with the only exception being those trained to enter under the specific hazard conditions. Fires and potential explosion situations require immediate evacuation. The evacuation perimeter should provide protection to all people that may be affected by the release/spill hazards or its potential escalation to a worst case scenario such as an explosion.

During isolation and evacuation procedures, only trained and authorized responders (see ORT organizational structure in Section 5), must be allowed inside the isolated perimeter.

In cases of crude oil and refined products, best occupational health and safety practices indicate the following isolation and evacuation zones:

- Small Spill and Gas Release- As an immediate precautionary measure, isolate spill or release area for at least 50 metres (150 feet) in all directions. Safety Officer should evaluate the risk potential and need for evacuation on a case by case basis.
- Large Spill and Gas Release - As an immediate precautionary measure, isolate spill or release area for at least 50 metres (150 feet) in all directions and consider initial downwind evacuation for at least 300 metres (1000 feet).
- Fire (If tank or tank truck is involved in a fire) - isolate for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

For other types of hydrocarbons (e.g., liquefied petroleum gases) more rigorous isolation and evacuation practices must be followed according to the specific hazards described in the SDS of each product. For example, best occupational health and safety practices for responding to propane releases indicate:

- Large Releases - Consider initial downwind evacuation for at least 800 metres (1/2 mile).
- Fire – If a tank, rail car or tank truck is involved in a fire, isolate for 1600 meters (1 mile) in all directions; also consider initial evacuation of all people inside a radius of the same distance.

Fire and explosion hazard —

- Consider all spills as potential fire hazards until otherwise established. This is particularly true in the case of large continuous spills and of refined product spills.
- Consider any spill involving confined airspace in which vapours may accumulate, particularly those involving refined products, as potentially explosive situations.
- Approach any hydrocarbon release from upwind, if possible.

- Measure vapour concentrations (lower explosive limits, LEL) when entering any structure or confined location (such as under docks, under bridges) where spillage may exist.
- If meter readings indicate vapour concentrations greater than 10% of the LEL, evacuate personnel from the immediate area, control spark sources closely, and cordon off the area.

The Lower Explosive Limit (LEL) is the minimum concentration of a gas or vapour necessary to support its combustion in air. Below this level, the mixture is too "lean" to burn. At the Upper Explosive Limit (UEL), explosions will not occur due to excessive vapour concentrations and lack of oxygen. Above this level, the mixture is too "rich" to burn. The range between the LEL and UEL is known as the flammable range for that gas or vapour. Guidelines for conducting response operations in the presence of potentially explosive vapours are as follows:

<10 percent LEL: Continue response operation. Most immediate dangerous to life or health contractions (IDLHs) for flammable gases or vapours in the oil and gas industry are established at 10% of the LEL. An LEL reading of 10 percent is equivalent to an airborne concentration of 100,000 ppm which will require appropriate respiratory protection.

>10 percent LEL: Explosion hazard present. Terminate response and withdraw from area immediately.

Vapour toxicity/carcinogenicity hazard —

- Monitor for H_2S if crude oil spill (crude oils that contain H_2S concentrations can present serious human health risks).
- Conduct air monitoring for organic vapours (in addition to fire hazards, organic vapours may pose a toxicity or carcinogenicity hazard, or result in a lower oxygen environment), if deemed necessary, according to the expected hazards of the material spilled.
- Wear respiratory protection at the spill location, if indicated by measured vapour concentrations, until subsequent air monitoring indicates otherwise.

Consistent with Kenya air quality regulations (Environmental Management and Coordination Act, No. 8 of 1999), Part VII, 31(a), the Kenya Directorate of Occupational Health and Safety (DOSH), in consultation with NEMA could prescribe exposure limits of air pollutants and hazardous substances. Permissible exposure limits (PELs) and short-term exposure limits (STELs) for all personnel should be observed for vapours and gases associated with the spilled oil (Table 2-1). DOSH has adopted two recommended exposure limits (RELs) to be monitored during spill response operations:

- 8 Hour PEL: the concentration that must not be exceeded during any 8-hour work-shift of a 40-hour work week, and
- 15 min STEL: the concentration that must not be exceeded for more than 15 minutes at any time during a workday.

The LELs and RELs for most common substances are based on each specific product safety data sheet (SDS). The most common types of petroleum products (classified as HNS per the IMO) currently used in Kenya are:

- PMS: Premium Motor Spirit, Petrol, or Gasoline
- AGO: Automotive Gas Oil, Automotive Diesel
- ATK: Turbine Kerosene, Jet A1 Aviation Fuel
- IDO: Industrial Diesel Oil, Industrial Diesel

Some REL examples for vapours and gasses associated with crude oil and petroleum products commonly used in Kenya are shown in Table 2-1.

Table 2-1 Exposure limits as REL for oil spill response

Material	8 Hour PEL	15 Min STEL
PMS, Petrol or Gasoline	300 ppm	500 ppm
Benzene	1 ppm	5 ppm
AGO, ATK, IDO, Crude Oil	As indicated on the product or compound specific Safety Data Sheet or SDS	

2.3.3.2 Minimum Personal Protective Equipment

The Safety Officer will instruct response personnel of the minimum level of personal protective equipment (PPE) needed for assigned response activities. In lieu of specific instructions, to be developed at the time of an incident, response personnel should follow the minimum PPE recommended in the Safety and Health Awareness for Oil Spill Clean-up Workers Education and Training Program adopted by the DOSH; (DOSH, 2019) *Adapted from the U.S.A. Occupational Safety and Health Administration program and to be adopted by DOSH.*

All personnel are to be protected from **hazardous** atmospheres. If practical, workers should be positioned upwind the vapour source. Appropriate PPE, including respiratory protection, will be selected by the SO based on hazard assessments. As an example, Table 2-2 outlines respiratory safety considerations for potential hydrocarbon and benzene exposures.

Table 2-2 Air monitoring and entry guidance

Assessed Conditions	Response Requirement
Unknown O_2 concentration or O_2 below 19.5%	NO ENTRY ALLOWED
Unknown LEL concentration or LEL ≥ 10%	NO ENTRY ALLOWED
Over 10,000 ppm hydrocarbons or over 50 ppm benzene	Supplied Breathing Air Respirators
2,000 to 10,000 ppm hydrocarbons or 10 to 50 ppm benzene	Full-face multi-gas cartridge respirator

Assessed Conditions	Response Requirement
200 to 2,000 ppm hydrocarbons or 0.5 to 10 ppm benzene	Half-face organic vapor cartridge respirator
0 to 199 ppm hydrocarbons or 0 to 0.5 ppm benzene	Respirator not required

Respirators can only be used if there is periodic monitoring of the work area. For sustained readings of greater than 10 ppm of total hydrocarbons, an appropriate gas multimeter, a colorimetric indicator tube test utilizing a Draeger Chip Measurement System (CMS), or Sensidyne test kit (or equivalent) should be performed for the presence of benzene.

Respirators must be successfully fit-tested before use in the spill clean-up operation. Respirators should be replaced every 8 hours (once per shift) or when the user begins to smell hydrocarbons while wearing the respirator.

2.3.4 Site Management

Any ORT responding on behalf of the RP, or NEMA should be capable of implementing the appropriate procedures to identify and prioritize onsite incident specific problems, define solutions to each problem, separate problems into manageable tasks, and monitor response operations. If an IMT is activated, the ORT On-scene Commander (OC) reports to the IMT Operations Section (See Section 5, Response Management and Organization).

2.3.5 Site Communications

Any ORT responding on behalf of the RP, or NEMA should establish the appropriate communications to ensure safety of responders and effectiveness of the response operations. At a minimum, this includes:

- Tactical Network: communication between the OC and any ORT Task Leader,
- Supply Network: communication between Staging Area Manager and IMT Logistics Section, and
- Command Network: communications between the OC and the IMT-Operations Section.

Details of the emergency management procedures and of communication protocols for Tier 1, 2, and 3, between any ORT and the IMT are described in Section 5 and Section 7.5, respectively, of this Onshore-NCP.

2.4 Plan Activation

The activation of this Onshore-NCP depends on the lead agency (NEMA) assessment. Once notified through the NEMA Incident Line, NEMA will mobilized on-duty IMT personnel to assess the actual and the potential impact to people and the environment, the location (environmental and socio economic sensitivity), and the response and management capacity of the organization in place, to determine the proper level of response organization required (Section 5.1). If no RP is undertaking a response, or the response is deemed inadequate, NEMA may activate this Onshore-NCP,

If NEMA considers that the incident is of national significance, a National Incident Management Team (National-IMT) and this Onshore-NCP will be activated. An incident of national significance for the activation of this Onshore-NCP, is defined as a hydrocarbon release that, is so complex that it requires extraordinary coordination of National (multiple agencies and organizations, county government, and responsible party) resources to contain and clean up the discharge.

2.5 Spill Reports

All spills must be verbally reported immediately to NEMA, as the response lead agency, unless the spill occurs in a Port area when KPA must be notified first. Formal written reports of spills must be submitted to the NEMA at the earliest practical opportunity and within 3 working days of the incident happening, if the spill is:

- more than 318 litres or 0.27 tonnes (2 bbl or 84 gallons) within a containment bund;
- more than 159 litres or 7.35 tonnes (1 bbl or 42 gallons) outside a containment bund;
- more than 79.5 litres or 3.68 tonnes (0.5 bbl or 20 gallons) outside of a facility; or
- 4 litres or more that reaches any body of water of Kenya.

All spills should also be reported to NEMA, as the national environmental authority, on a quarterly basis. Written reports must include the following minimum information:

- Responsible Party
- Date and time of initial release
- Material(s) spilled and estimated quantity
- On-site only or Off-site including receiving environments and extent of oiled area(s)
- Notifications log (date and times)
- Summary of response actions
- Impacts and/or Claims

The NEMA may request additional information and post-spill review and evaluations, as described in Section 10.7, Debrief, of this Onshore-NCP.

2.6 Regional and International Reporting

In the event of a spill determined to be beyond the resources of Kenya (including access to Tier 3 resources through the RP international agreements) and recognizing the need for speedy deployment of reinforcements, NEMA, in coordination with any other agency as appropriate (e.g., NDOC and EPRA), through a designated Liaison Officer, will then:

- contact the lead agencies for spill response in the affected neighbour country (i.e., Tanzania, Somalia, Uganda, Ethiopia, and South Sudan) and arrange for specialized equipment and technical support (see **Appendix D –** Cross Boundary Movement), and
- request, as needed, third party access to clean-up facilities, trained personnel and air deployment using dedicated aircraft.

Contents

3 Response Hazards and Project Risk Assessment and Management

Oil and gas (O&G) industry operations, especially from pipelines and oil-trucks, and possible equipment failures present the greatest risks for spills to the Onshore environment of Kenya. Potential risks associated with pipelines and oil trucks include collision, fire, or explosion. Hydrocarbon releases from pipelines, trucks, or onshore upstream operations may threaten the Kenya environmental and socio-economic resources, wildlife and water intake sources. Additionally, onshore spills can threaten national monuments, tourism industry and local populations.

3.1 Spill Sources

3.1.1 Historical Spill Hazards

Most of the Information available from historical spill incidents is focused on the marine and coastal environment and is discussed in detail in the Marine and Navigable Waters NCP. Historical spill data from the OSMAG Society identifies equipment or operational failures during transfers as the most common cause for past onshore incidents (Table 3-1).

Table 3-1 Summary of historical Onshore spill data

Source	Years	Incidents recorded	Comments
OSMAG Society	2002-2018	93 historical cases recorded: Equipment failure (72%) Near misses (14%) Road tanker trucks (5.4%) Other (9%)	Equipment failure includes transfer operations

Oil pollution incidents can be caused by several different sources, including but not limited to road tanker trucks accidents, equipment failure associated with storage facilities and pipelines, and illegal discharges oil or fuel theft. Natural disasters (e.g., flooding, cyclones, earthquakes) can also cause direct or indirect damages to pipelines and hydrocarbon handling facilities.

The risk for onshore hydrocarbon release is greater near the Mombasa area as the primary port of entry and distribution point for all types of oil into Kenya. Additional areas of greater risk of releases to onshore areas include transport routes (highways), pipelines and associated valve sites, and oil/gas production sites. Hydrocarbon release hazards can be classified according to the industry sector for the source of the incident.

3.1.2 Upstream Hazards

The Upstream sector of the O&G industry includes five stages: exploration, appraisal, development, production, and decommissioning. The potential impact of a hydrocarbon escape during any of these stages depends on the magnitude of the event, sensitivity of resources at risk, and the emergency management capability in place to safely, timely, and effectively mitigate the consequences. Well blowouts can occur during exploration, production and decommissioning stages creating a significant safety risk.

Figure 3-1 Inland well blowout while being decommissioned. Source: www.archive.epa.gov

While well drilling and completion operations could involve a potential well blowout and significant volume spilled continuously until the well is fully under control, the impact of any small poorly managed spill near a sensitive environmental or socio-economic resource could be significantly higher. Therefore, any upstream operator (including drilling contractors) must have a robust emergency management response program consistent with this Onshore-NCP to identify specific spill scenarios, resources at risk, response priorities, and response strategies.

Exploration and production blocks in Kenya are geographically spread across the country (Figure 3-2) and are active in the Lokichar Basin, where the Project Oil Kenya is located. The project involves transporting crude oil, by tanker trucks, from Lokichar to Mombasa for temporary storage at the refinery tanks (600 barrels of oil per day (BOPD) in 2018 and 2,000 BOPD in 2019), creating a spill hazard for onshore and marine environments.

Project Oil Kenya full field development and "first-oil" is expected between 2020-2022; this includes a proposed 18" diameter and 821 km long crude oil pipeline from Lokichar to Lamu (Figure 3-3). Meanwhile, the potential spill hazard of trucking crude oil to Mombasa will continue.

3.1.3 Midstream Hazards

Kenya Pipeline Company Limited (KPC) operations represent the primary midstream oil industry in Kenya, which encompasses pipeline distribution of refined products from the Indian Ocean to seven (7) terminals between Mombasa, Nairobi, Kisumu (Lake Victoria), and Eldoret (Table 3-2 and Figure 3-2).

KPC strives to improve their spill prevention program; however, spills continue to occur along the pipelines, with some segments more than 40 years old and in constant need of repair. In September 2011, more than 100 people died and 116 were injured during an explosion secondary to a fuel spill on a KPC pipeline in Lunga Lunga (Nairobi) near Sinai.

The proposed new pipeline (included in Project Oil Kenya), from the Turkana production area to a proposed new marine terminal at Lamu will be an important consideration in midstream oil spill preparedness.

3.1.4 Downstream Hazards

Although there are no oil refineries currently operating in Kenya, the downstream industry includes petroleum product storage (Table 3-3), retail outlets, and in-country distribution operations. Downstream operators should prepare and maintain preparedness and response plans and demonstrate Tier 1 response capacity. Most potential downstream spill sources are small retail and trucking companies with very limited response capabilities; even a small event, such as a truck-tank rollover near sensitive environmental or socio-economic resources may become a spill of national significance; thus requiring the activation of this Onshore-NCP.

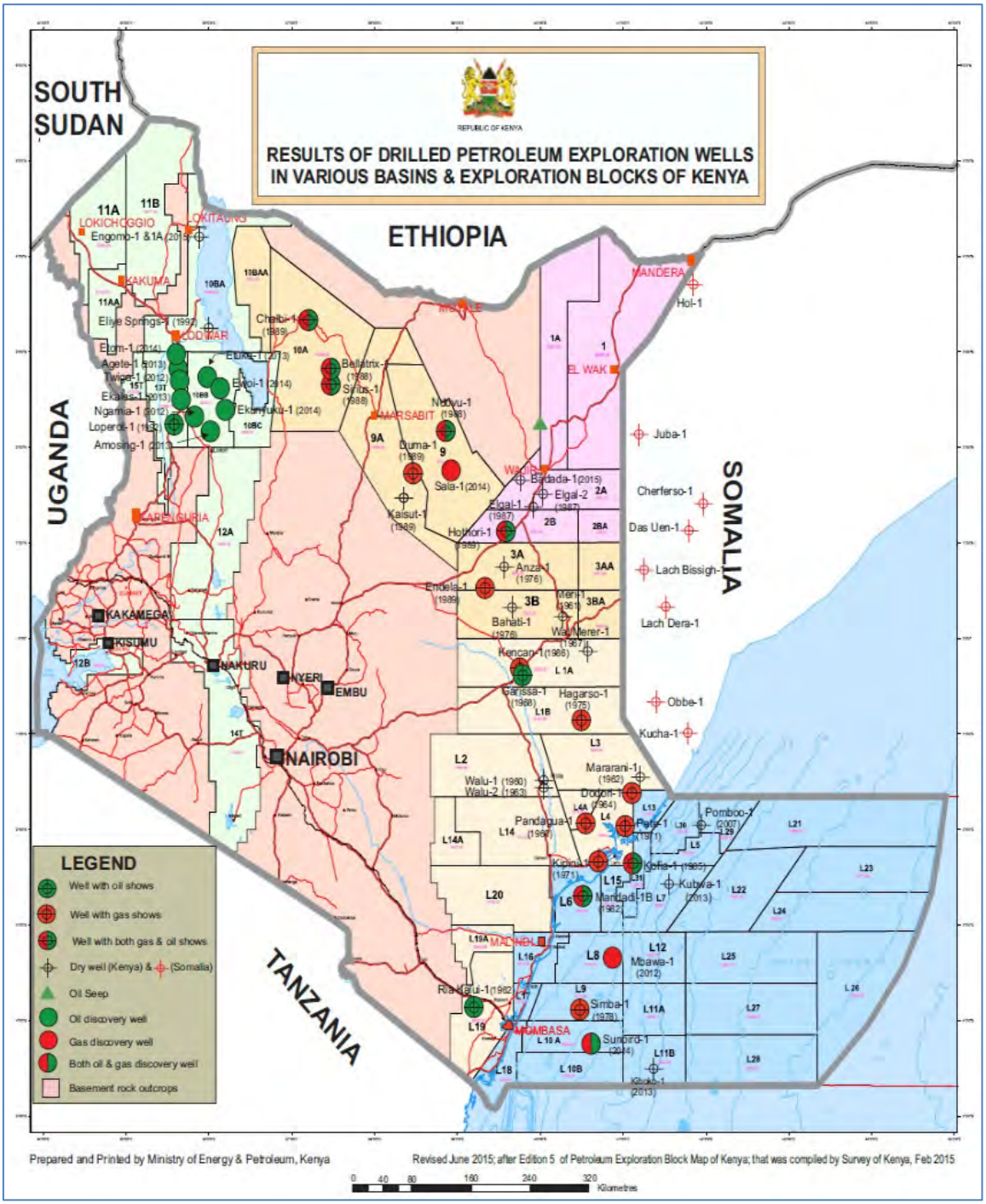

Figure 3-2 Exploration Block Map of Kenya. Source: https://nationaloil.co.ke

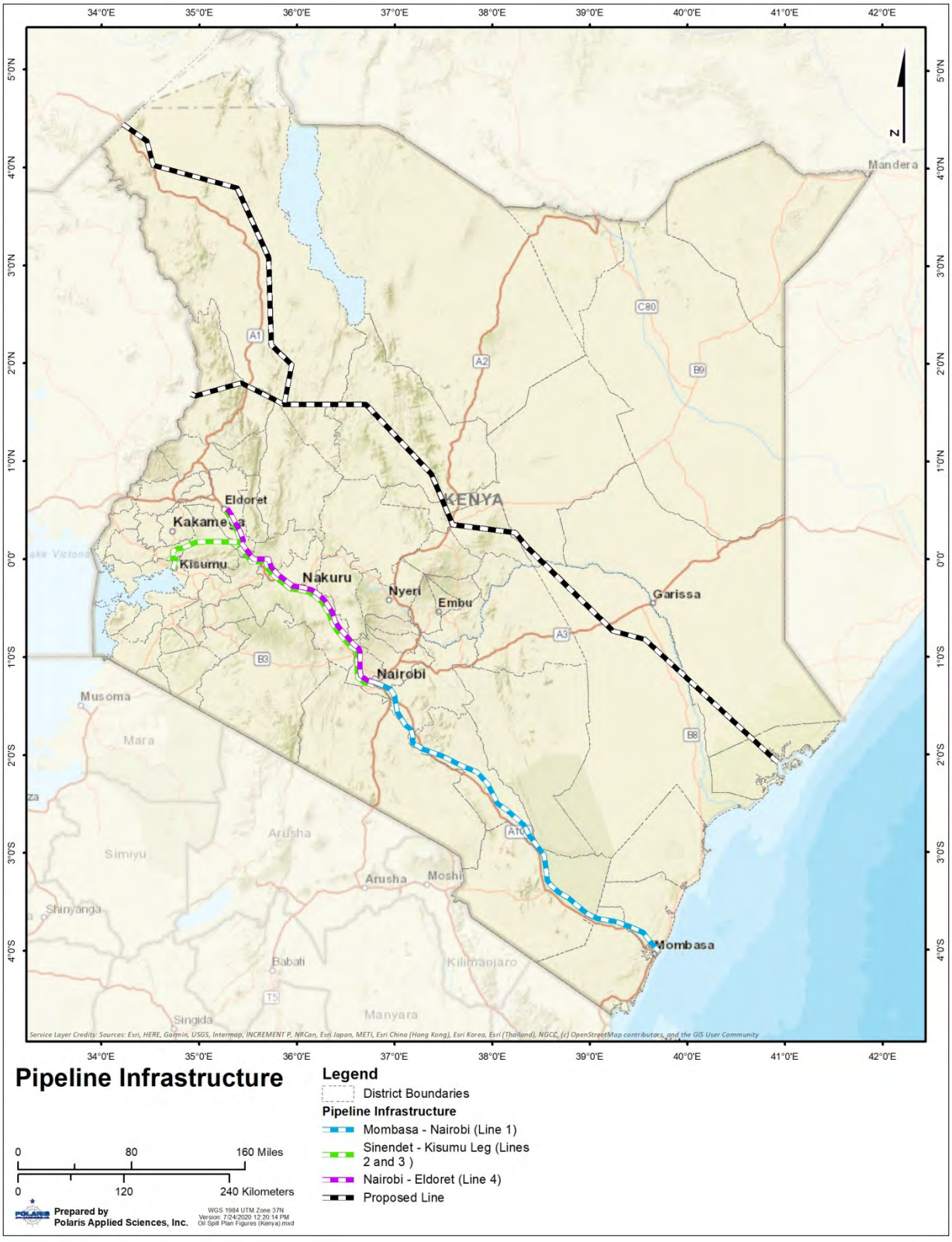

Figure 3-3 Kenya pipeline routes. Modified from KPC global emergency response plan

Table 3-2 KPC pipeline network (refined products). Note: Line V the new 20-inch Mombasa – Nairobi pipeline was completed in 2018 and is expected to have about 1.9 million liters per hour by 2023 and 2.6 million liters per hour by 2044.*

Name	Diameter Units: cm (inches)	Length (Km)	Pumping Rate (m^3/hr)	No. of Pumping Stations
Mombasa - Nairobi (Line I)	35.6 (14)	450	830	8
Mombasa - Nairobi (Line V)	20	450	1,900*	8
Nairobi - Nakuru - Eldoret (Line II)	20.32 and 15.24 (8 and 6)	325	220	4
Sinendet - Kisumu (Line III)	15.24 (6)	121	100	
Nairobi - Eldoret (Line IV)	35.6 (14)	325	311	2
Sinendet - Kisumu (Line IV)	25.4 (10)	121	350	
Spur Line from KOSF to Shimanzi Oil Terminal	30.48 (12)	2.8	450	1
Changamwe - Moi Int. Airport	15.24 (6)	3.8	120	1

Table 3-3 Main Oil Storage Facilities

Facility - Location	Number of Tanks	Max Capacity each tank*		Contents
		(Tonnes)	(bbl)	
Kipevu- Mombasa				
Moi International Airport- Mombasa				
Embakasi-Nairobi				
Nakuru				
Eldoret				
Kisumu				

Operating capacities of storage tanks are typically 90% or less of the maximum capacity. Source: Pending information to be provided by KMA or KPC

3.2 Hydrocarbon Types Handled in Kenya

The list of petroleum substances handled in Kenya (which this NCP refers to as Hydrocarbon or Oil) is extensive. Some commonly known hydrocarbon gases include methane (CH_4) (primary component of natural gas), ethane (C_2H_6), propane (C_3H_8), and butane (C_4H_{10}). Of these hydrocarbons, propane, butane, and their isomers are classified as Liquefied Petroleum Gases (LPG).

Primary safety and environmental considerations must be addressed by first responders to ensure safety or personnel and public and minimize impact on the environment; Section 2. Table 3-5 show examples of safety hazards associated with different types of hydrocarbons released into the environment, including gases and liquids of a wide variety of physical and chemical properties.

Hydrocarbons released in liquid phase (referred to as Oil in this NCP) have the potential to create significant environmental damage when spilled and response operations are not managed properly. This Onshore-NCP is to be used for any onshore hydrocarbon release, including, but not limited to spills of:

- crude oil, and
- refined products handled in Kenya (these may be listed as hazardous and noxious substances (HNS) in the OPRC-HNS Protocol):
    - Automotive gas oil; aliases: AGO, Automotive Diesel
    - Industrial Diesel Oil; aliases: IDO, Industrial Diesel
    - Dual-Purpose kerosene; aliases: DPK, Turbine Kerosene (ATK), Jet A1 Aviation Fuel
    - Motor spirit Premium; aliases: MSP, Premium Motor Spirit (PMS), Petrol, Gasoline

Light oils (e.g., AGO and Jet A1) are more acutely toxic than are heavier oils (e.g., IDO, crude oil); the weathering process is also different between different types of oil (Section 3.4). Increased weathering generally lowers oil toxicity.

3.2.1 Safety Data Sheets (SDS)

Safety Data Sheets (SDS) (of any spilt substance or chemicals used during response operations) provide basic critical information for ensuring safety of people and estimating the substance behaviour. **SDS are to be maintained by the Kenya Fire Department and NDOC, in collaboration with NEMA (Appendix F – SDS)**. All oil handling, transport, and storage facilities are required to submit appropriate SDS information for all products stored onsite to NEMA, the Fire Department, and to the KPA for ports. The SDS should align with the Globally Harmonized System (GHS) of classification and labelling of chemicals, following the GHS format with 16 sections, including information on safety hazards associated with the product, first aid and firefighting procedures, recommended personal protection equipment, and initial spill response procedures.

Table 3-4 Safety hazards of exposure to hydrocarbons based on international agency for research on cancer data. Source: http://www.ipieca.org

Petroleum Substance Groups	Relevant Hazard Classes to be Evaluated	Possible Constituents of Concern
Crude oil	Carcinogenicity, mutagenicity, acute toxicity	H_2S[a], Benzene[b], PAHs[c]
Petroleum gases	Carcinogenicity, mutagenicity, acute toxicity	1,3-Butadiene[d], H_2S[a]
Naphthas/gasolines	Carcinogenicity, mutagenicity	Benzene[b]
	Specific target organ toxicity	n-Hexane, Toluene, Benzene
	Reproductive effects	n-Hexane, Toluene, Xylene
Kerosines	------	------
Gas oils	Carcinogenicity	PAHs[c]
Heavy fuel oils	Carcinogenicity, reproductive effects, acute toxicity	PAHs[c], H_2S[a]
Residual aromatic extracts	------	------
Untreated distillate aromatic extracts	Carcinogenicity, reproductive effects	PAHs[c]
Treated distillate aromatic extracts	Carcinogenicity, reproductive effects	PAHs[c]
Lubricant base oils	Carcinogenicity, reproductive effects	PAHs[c]
Petroleum waxes	------	------
Petrolatums	Carcinogenicity, reproductive effects	PAHs[c]
Foots oils	Carcinogenicity, reproductive effects	PAHs[c]
Slack waxes	Carcinogenicity, reproductive effects	PAHs[c]
Bitumens (asphalts) and vacuum residues	------	------
Petroleum cokes	------	------

[a] *Hydrogen sulphide is an acutely toxic gas, which can be released from some groups of petroleum substances.*

[b] *Benzene is classified by IARC as a Group 1 carcinogen ("Carcinogenic to humans").*

[c] *Several 3-7 fused-ring Polycyclic Aromatic Hydrocarbons (PAHs) are classified as Group 1 or 2 carcinogens ("Carcinogenic to humans" or "Probably/possibly carcinogenic to humans") by IARC. Others are not classified or non-classifiable.*

[d] *1,3-Butadiene is classified by IARC as a Group 1 carcinogen ("Carcinogenic to humans").*

3.3 Behaviour of Hydrocarbon Releases

3.3.1 Gas Hydrocarbons

Safety and health guidelines to protect responders during firefighting and explosion prevention operations, such as the National Fire Protection Association or the International Fire Code, should be followed during response to gas and hydrocarbons release emergencies. This includes, but is not limited to, responding to Boiling Liquid Expanding Vapor Explosion (BLEVE) events.

Risk assessment during gas release response could change throughout the incident as conditions improve or degrade. For example in the early stages of a fire involving a gas storage tank, the risk to onsite responders may be very high as cooling water is applied to the tank. If the tank is adequately cooled, the level of risk will decrease. If cooling water is inadequate, the level of risk could increase since the container may fail, which may result in severe impacts to responders and property. The hydrocarbon Safety Data Sheet (SDS) should include the specific characteristics of the gas such as flammable range, vapour density, expansion ratio, and ignition temperature. The characteristics of the receiving environment such as risk to people, explosion hazard if the released gas is contained or trapped, ignition sources must also be considered; see initial tactical response procedures in Section 2..

3.3.2 Liquid Hydrocarbons

The weathering or fate of oil spilt on land (including crude oil and refined products) depends on the oil properties (oil density, viscosity) and environmental conditions (soil porosity, water saturation). Weathering occurs by evaporation, microbial degradation, chemical oxidation, and photochemical reactions. Some oils weather rapidly and undergo extensive changes in chemical composition and character, whereas others remain relatively unchanged over long periods of time. The effects of weathering are generally rapid (1 to 2 days) for hydrocarbons with lower molecular weights (e.g., refined products) as a result of evaporation. Degradation of the higher weight fractions is slower and occurs primarily through microbial degradation and chemical oxidation. It is important to recognize the dynamic nature of the type of oil and the fact that **the properties of spilt oil change over time**. During a response operation, it is important to assess the changes in the properties of the spilt oil, as response strategies may have to be modified; see Section 6.

Oils may be classed in groups (from 1 to 5) depending on the type of oil density (Table 3-6) and as persistent or non-persistent depending on the type of effort to remove or clean-up the spilt oil.

The response operations for non-persistent could be one of simple evacuation and monitoring while responding to persistent types of oil may require a combination or strategies (Section 8).

Persistent oils remain on the sea surface following a spill and will require response activity for removal. Non-persistent oils tend to dissipate without assistance and require less intervention following a spill. This idea of persistence is very important when considering planning a response strategy (Section 8), as the way in which an oil spill behaves and changes, whether on water or on land, depends largely on how persistent the oil is.

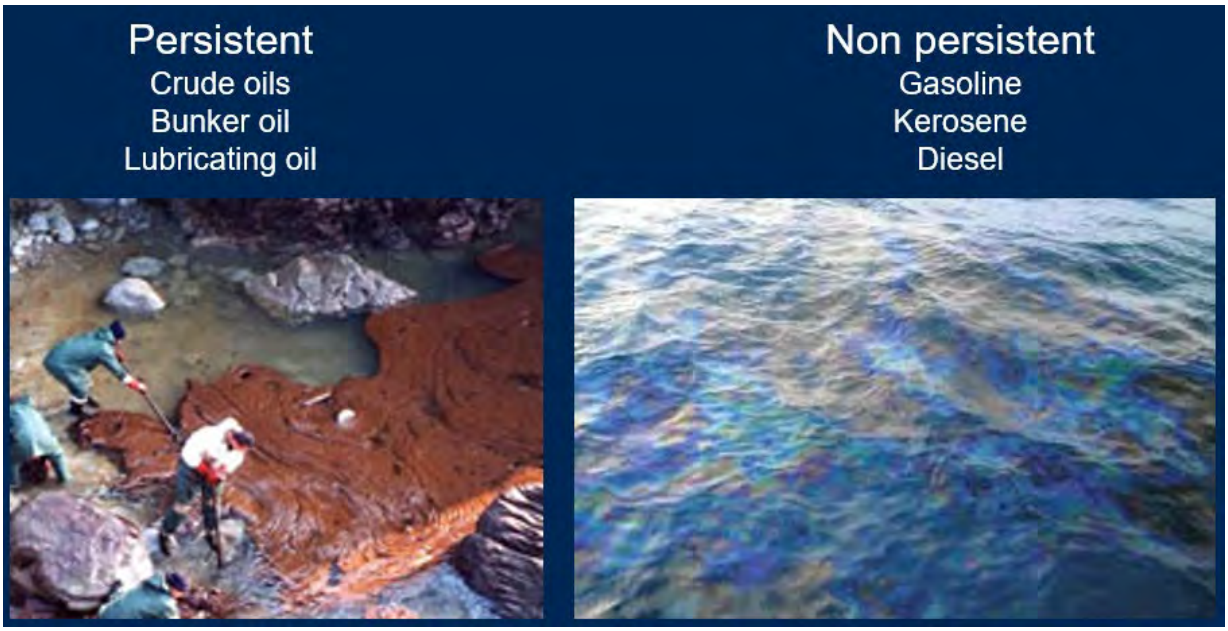

Figure 3-4 Types of oil from planning a response perspective. Source: http://www.itopf.com

Light products such as kerosene are non-persistent oils as they tend to evaporate and dissipate quickly. Spills of non-persistent oil to water will spread and evaporate quickly. Protection of sensitive resources from exposure to non-persistent oils, such as closing water intakes, is a priority response strategy. Non-persistent oils that infiltrate soils or enter groundwater will require more extensive clean-up operations than if only on solid surfaces or water. Persistent oils, such as many crude oils, are more viscous than non-persistent oils and typically require more effort for containment, sensitive area protection, and clean-up response.

3.3.3 Spills to Land

Oil movement or flow over the ground surface follows the topography of the land (oil flows downhill). In general, oil will flow until it reaches a surface water body or a depression, or until absorption prevents further movement. Oil flowing over land can infiltrate vegetation cover and soil. The rate of oil movement over land and depth of penetration into soil are dependent on a variety of factors and are best determined by direct observation.

If oil enters ground water, the petroleum hydrocarbons generally remain concentrated in plumes. Because ground water moves relatively slowly, petroleum hydrocarbons do not mix or spread rapidly. Petroleum in contact with ground water may eventually migrate and appear in surface waters. Groundwater monitoring, sampling, and analyses may be required to determine the extent, fate, and degradation of any hydrocarbon plumes.

Table 3-5 Oil groups properties and typical behaviors

Group	Properties and Typical Behaviors
Group 1: Gasoline Products	— Specific gravity is less than 0.80; API gravity >45 — Very volatile; National Fire Protection Association (NFPA) class is "flammable liquid" — Very volatile and evaporates quickly with no residue (in a matter of hours for spills to water) — Relatively soluble, but dissolved components often rapidly partition into the air — Low viscosity; spread rapidly into thin sheens — Readily penetrate into porous substrates, but are not sticky — High acute toxicity but short-term exposure due to rapid evaporation — High risk of ignition and air quality concerns for responders and the public
Group 2: Diesel-like Products, Jet Fuels, Kerosene, Light Crude Oils, and Very Light Crude Oils	— Specific gravity is 0.80–0.85; API gravity 35–45 — NFPA class is "combustible liquid" — Volatile, with refined products leaving little to no residue. Crude oils can have residue after evaporation is complete — Moderately soluble and toxic with dissolved components somewhat persistent as partitioning into air is slower — Low to moderate viscosity; spread rapidly into thin slicks on water — Do not readily emulsify except in cold temperatures — Readily penetrate porous substrates — Are more bioavailable/toxic than lighter oils (in part because they persist longer), so that animals in water and sediments are more likely to be exposed
Group 3: Medium Crude Oils and Intermediate Products	— Specific gravity of 0.85–0.95; API gravity 17.5–35 — Moderately volatile — For crude oils, up to one-third can evaporate in the first 24 hours — Moderate to high viscosity; spread into relatively thick slicks — Can form stable emulsions which increases viscosity — Many have limited solubility — Are more bioavailable/toxic than lighter oils (because they persist longer), so that animals in water and sediments are more likely to be exposed — Can penetrate porous substrates — Persistent residues can have long-term toxicity
Group 4: Heavy Crude Oils and Residual Products (includes Diluted Bitumen products)	— Specific gravity of 0.95–1.00; API gravity of 10–17.5 — Very little product loss by evaporation or dissolution (with exception of diluted bitumen products where the diluent component may evaporate over time) — Very viscous to semi-solid; can be heated during transport — Can form stable emulsions which increases viscosity but tends to break into tar balls quickly — Low acute toxicity to water-column biota — Penetration into substrates can be limited at first, but can increase over time — Can cause long-term effects via smothering or coating, or as residues in a water column and sediments, though generally less bioavailable than lighter oils
Group 5: Nonfloating Oil Products: Slurry Oils, Coal Tar Oils, Carbon Black Feedstock, Very Heavy Crude Oils, and Asphalt	— Specific gravity of >1.00; API gravity <10 — Limited product loss by evaporation or dissolution — Very viscous to semi-solid; can be heated or blended with a light product (which can evaporate once spilled) to facilitate pumping/transport — Low acute toxicity to water-column biota (though can have some toxicity if blended with a lighter, more-toxic diluent) and less bioavailable than lighter oils — Penetration into substrates may be limited at first, but can increase over time — Can cause long-term effects via smothering or coating, and as residues in soils

3.3.4 Spills to Water

The fate of hydrocarbons on water depends on a number of factors, including air and water temperatures; winds, waves, and currents; the type and amount of nutrients and inorganic substances present; and the amount of sediment suspended in the water. Oils that reach surface waters will spread

laterally and be transported downstream by currents. Heavy (Group 4 and 5) oils may submerge or sink in fresh water settings.

3.4 Environmental and Socioeconomic Sensitive Areas

Protected areas in Kenya include 23 terrestrial National Parks, 28 terrestrial National Reserves, 10 marine protected areas, and several internationals reserves (Figure 3-4). Information on coastal and marine sensitivities can be found in the Marine and Navigable Waters NCP.

Socio-economic sensitivities include surface water intakes, tourism, and archaeological sites (Tables 3-4, 3-5; Figure 3-5).

Key sensitivities to oil spills and subsequent clean-up activities are globally defined through Environmental Sensitivity Indices (ESIs). ESI maps (including a list of endangered species) for the Kenya have been created for all coastal areas and can be found in the KenSea Environmental Sensitivity Atlas for Coastal Area of Kenya (Tychsen 2006), which is incorporated by reference to this Onshore-NCP.

Wetlands represent the most sensitive ecosystems onshore. The Kenya Wetlands Atlas (MEMR, 2012) shows a variety of wetland types that range from riverine, lacustrine, palustrine, estuarine, marine, to man-made and cover approximately 3 to 4 percent of Kenya's onshore territory, without considering rainy seasonal changes.

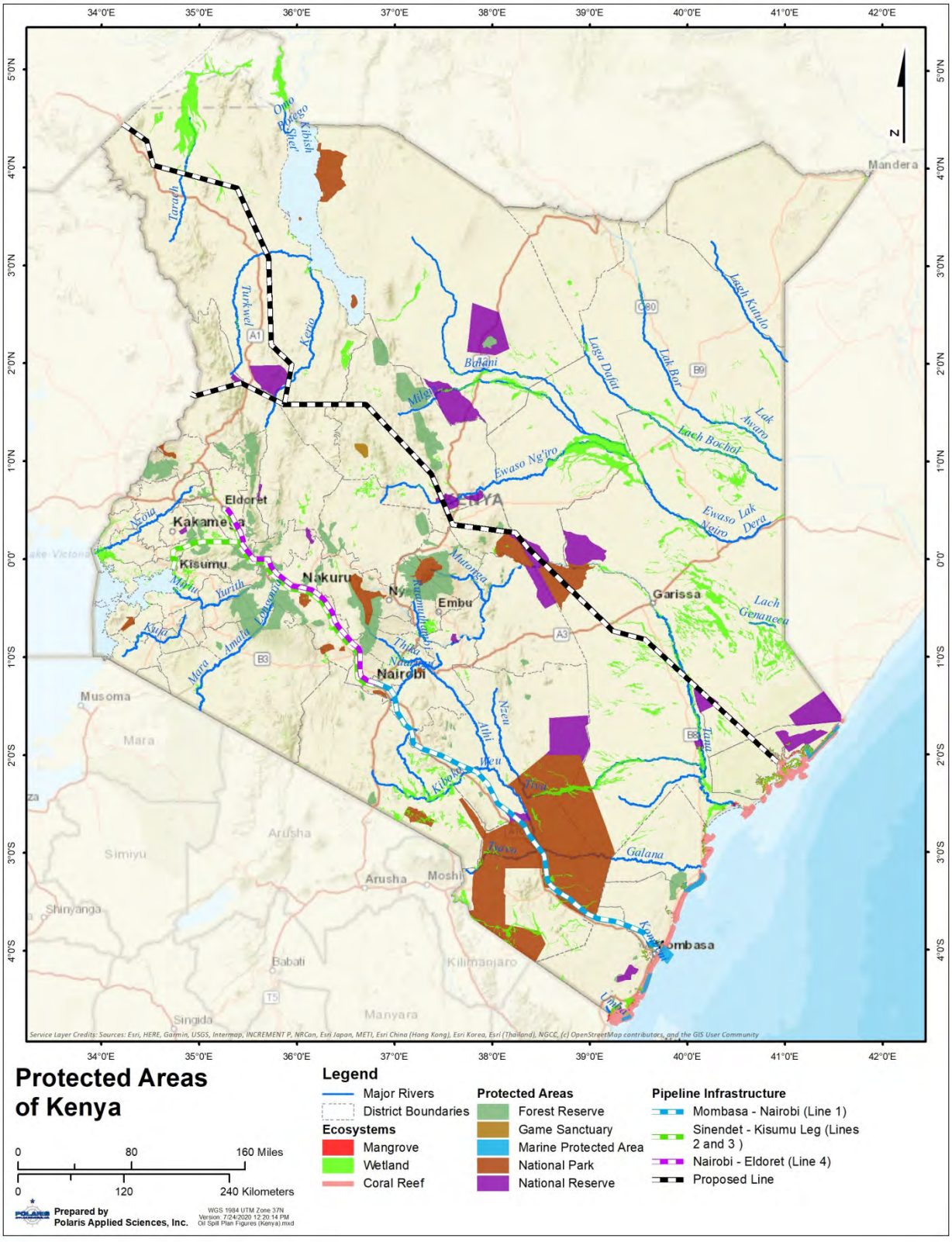

Figure 3-5 Protected areas of Kenya

Table 3-6 Socio-economic sensitivities

Features
Water Intakes • **Surface and subsurface (freshwater)** • **Drinking water, cooling water, process water**
Tourism • **Hotels** • **Ecotour sites**
Infrastructure • **Schools** • **Hospitals**
Transportation Corridors • **Highways** • **Rail routes and depots**
Archaeological sites • **NMK heritage sites** • **Traditional cultural harvest sites**

Table 3-7 Water abstraction points and intakes (surface only, not wells)

Applicant	Water Quality	County	Source Name	Purpose
…	Fresh			Irrigation?
…	Potable	.	.	Aquaculture, Domestic?

Information to be provided

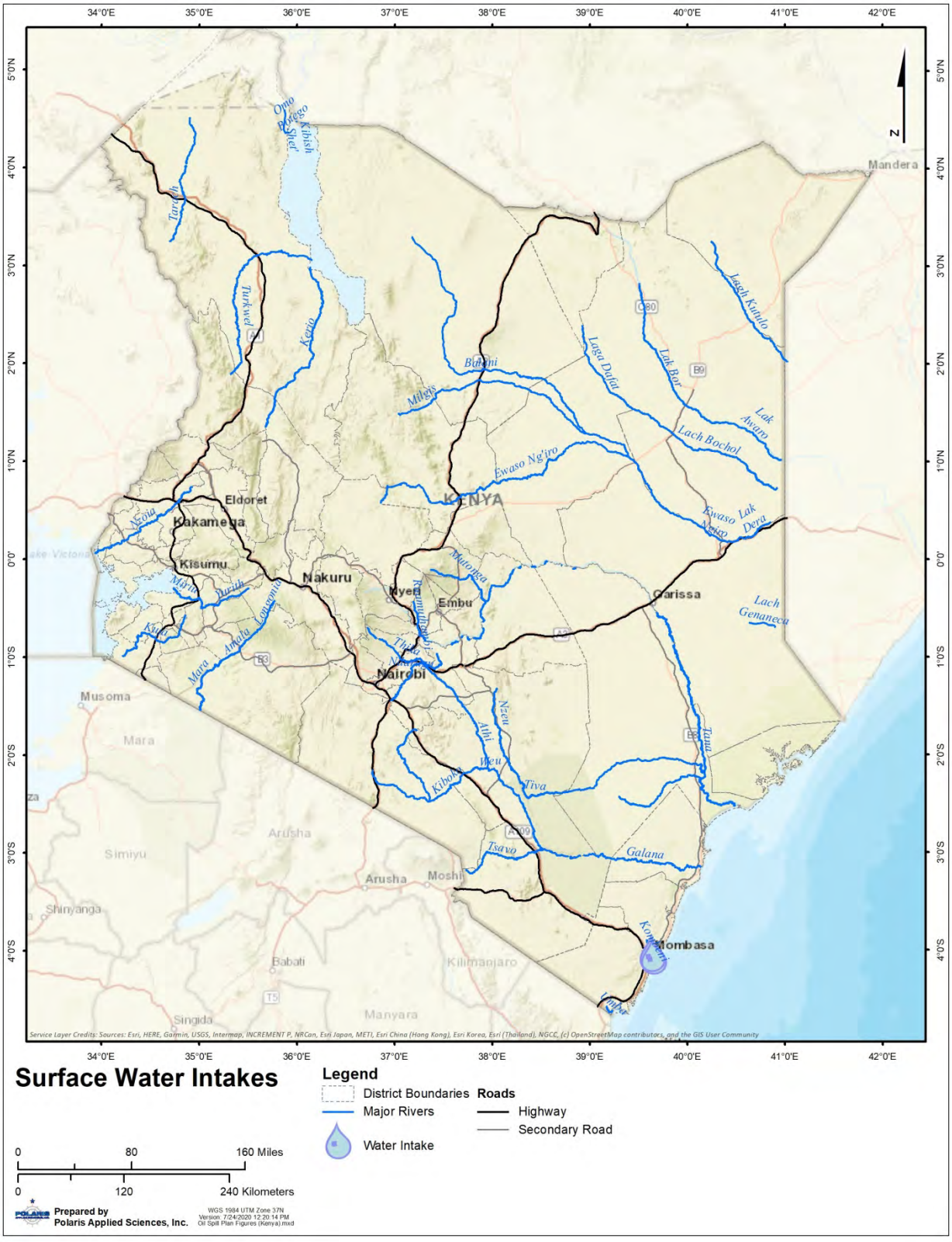

Figure 3-6 Surface water intakes; additional intakes locations to be provided by KMA

3.5 Cultural and Heritage Sensitive Areas

Protected areas in Kenya include heritage sites of unique importance to Kenya, the tourism industry, and to the UNESCO world heritage community. To minimize the actual and potential impact of a hydrocarbon release on culturally sensitive sites, once a National-IMT is activated local experts (e.g., local County government, National Museums of Kenya (NMK) Cultural Heritage Department Representatives) should be notified by the Environmental Unit Leader (EUL) through the Liaison Officer (LIO) for their input on key sensitivities in the potential pathway of the spill or release.

3.6 Spill Risk Assessment and Management Process for Industry

Risk assessment shall be applied as an aid to the decision-making process for new O&G projects and for changes to existing operations. Risk assessment methodologies are grouped in three categories: qualitative, semi-quantitative, and quantitative assessment. After the hazards have been identified, most of the methodologies require carrying out a risk estimation, which entails assessing both the severity (consequences) and frequency (likelihood) of hazardous events. The amount of detail and effort required to complete this risk estimation increases from qualitative, to semi-quantitative, and to quantitative risk assessment.

As options are evaluated, it is critical to analyze the level of risk introduced with each option. The analysis should address financial risks, health risks, process safety risks, environmental risks and ***oil spill response capability***. The information generated through risk assessment, and the decisions made, shall be communicated to the organization, to the authorities (KMA, NEMA and EPRA) and to the appropriate oil spill response organization (e.g., OSMAG Society).

In order to protect people and natural resources, KMA, in coordination with NEMA and EPRA, should require new facilities or new operations to employ risk reduction measures and to demonstrate that they can operate with a tolerable and as low as reasonably practicable (ALARP) level of risk. New facilities should be required to describe “worst spill case” and “provable” spill scenarios in their OSCP, as part of the permitting process.

Appendix I (Risk Assessment and Management Process), provides a guideline for conducting qualitative and semi quantitative risk estimation and assessment. Quantitative risk assessment requires advanced protocols to be followed that are not incorporated in this Onshore-NCP.

3.6.1 Qualitative Risk Assessment

The qualitative risk assessment approach is typically applied when the hazards are mostly self-evident from past experience and the measures for effective risk reduction are well defined. The measures for effective risk reduction are typically laid down in the RP or facility Tier 1 OSCP. Each OSCP shall include a list of pre-identified priorities for sensitive resources at risk for the “worst spill case” and “provable” spill scenarios.

3.6.2 Analyse Protection Priorities

A challenge in spill response planning, preparedness and execution is to prioritize sensitive receptors at risk of spill and clean-up impacts and to minimize the potential adverse effects in context of those deemed most important and critical. There is no single answer to a list of priorities with the exception of safety and human health. After safety and human health considerations are accounted for, environmental and socioeconomic criteria must be considered in terms of priority for protection and treatment (Table 3-6).

During an oil spill response, the Environmental Unit within the IMT organization (see Section 5.5) should review the preliminary list of resources at risk in the OSCP and identify and prioritize specific sites that are at risk during the spill, typically documented on ICS Form 232 (see Appendix B, Forms). Following acceptance by Unified Command, those priorities guide Operations during a response.

Table 3-8 Example of criteria for establishing priorities for sensitive resources at risk from a spill

Safety and Human Health Priorities (highest priority)	Environmental Priorities (may be seasonal)	Socio-economic Priorities (may be seasonal)
Populated areas	National Reserves / National Parks	Industrial water intakes (aquaculture, cooling, process)
Drinking and bottling water intakes	Wetlands and/or Mangroves	Tourist concentration areas (hotels, resorts, popular sites)
Agricultural water intakes	National Forests	Port facilities
	Game sanctuaries	Transportation infrastructure
	Shoreline environmental sensitivity index (ESI)	

This Onshore-NCP requires that protection priorities be pre-identified within each RP's OSCP and Local (County) OSCPs with the prime objective being to increase the initial response effectiveness and speed during real events.

3.6.3 Semi-Quantitative Risk Assessment

The semi-quantitative risk assessment approach is typically applied when a hazard identification study has revealed a potentially severe event, which would be difficult or expensive to protect against. The semi-quantitative risk assessment approach requires hazard identification to be accomplished by a mixture of creative thinking and structured critical examination, and then subjected to a technical analysis to help decide the most effective risk reduction measures (Addendum 1 -Guidelines for Risk Assessment and Management).

3.6.4 Risk Assessment Matrix and Risk Tolerability Criteria

The recommended tool to be used for semi-quantitative risk assessment and management process within the Kenya O&G is the Risk Assessment Matrix. The Matrix standardizes semi-quantitative risk

assessment and facilitates the categorization of risks to people, environment, assets and reputation. The purposes of the Risk Matrix include:

- Prioritization of risks, and their risk reduction efforts, and for defining their tolerability,
- Incident reporting and investigation,
- Classification of findings from different process safety activities (e.g. inspections, audits, etc.), and
- Ensuring that adequate measures are taken to eliminate, or reduce those risks to a tolerable and as low as reasonably practicable (ALARP) level.

Table 3-9 Criteria for Estimating Consequence

Categories	Consequence				
	Negligible (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Severe (5)**
People	No injury or damage to people.	Reversible minor employee injury not affecting work performance, requiring short-term hospitalization.	Moderate irreversible impairment to one or more employees that can result in lost workdays (LTI), or restricted work.	Single employee fatality or permanent total disability to one or more employees, and some impact on third parties.	**Multiple employee fatalities, and/or multiple third-party fatalities.**
Environment	No negative impact to environment.	Minor damage, but no lasting effect. Examples: 1-Small or not removable oil or HNS spill requiring short-term (1-4 days) cleanup operations. 2-On-site groundwater contamination. 3-Complaints from a single family or single individual. 4-Single exceedance of statutory or other prescribed limit.	Limited damage that will persist or require cleaning up. Examples: 1- Moderate complexity spill affecting only few (1 or 2) low sensitivity environmental resources and requiring more than 5 days of cleanup operations. 2-Observed off-site effects or damage, e.g. fish kill or damaged vegetation. 3-Off-site groundwater contamination. 4-Complaints from community organizations. 5-Frequent exceedance of statutory or other prescribed limit, with potential long-term effect.	Severe damage that will require extensive measures to restore beneficial uses of the environment. Examples: 1- Major, complex or compound incidents that impact any high sensitive environmental resource. 2-Off-site groundwater contamination over an extensive area. 3-Many complaints from community organizations or local authorities. 4-Extended exceedances of statutory or other prescribed limits, with potential long-term effects.	**Persistent severe damage that will lead to loss of commercial, recreational use or loss of natural resources over a wide area. Examples: 1-Any Major, complex or compound incidents that impact more than one high sensitivity environmental resource. and requires extensive clean-up and remediation measures.**

Categories	Consequence				
	Negligible (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Severe (5)**
Assets	Slight damage and/or operational impact with costs up to US$ 1.0 million	Minor damage and/or operational impact with costs between US$ 1.0 and 15 million	Partial damage and/or operational impact with costs between US$ 15 and 30 million	Major damage and/or operational impact with costs between US$ 30 and 140 million	**Significant damage and/or operational impact with costs above US$ 140 million, e.g. total loss of a facility.**
Reputation	**No media attention or minor, adverse local media or public attention**	**Attention from media; heightened concern by local community**	**Significant adverse county media or public or county government attention**	**Significant adverse national media or public or national government attention**	**International public or media attention, with potentially severe impact**

Table 3-10 Frequency Estimation

Frequency Category	Qualitative Interpretation Guidance	Quantitative Interpretation Guidance (yr^{-1})
A	**Very Unlikely** • Has happened once, or not at all in Kenya O&G • Has happened a few times, or not at all in O&G Industry	Less than 1E-05
B	**Unlikely** • Similar event may occur once in 50-100 years at one of Kenya O&G assets. • Have been isolated occurrences in Kenya O&G or has happened several times in the O&G Industry.	Between 1E-05 and 1E-04
C	**Possible** • Similar event may occur once in 10 to 50 years at one of Kenya O&G assets. • Has not happened before at the Asset or has happened a few times in Kenya O&G.	Between 1E-04 and 1E-03
D	**Likely** • Similar event may occur at Asset every 10 to 50 years. • Has happened once before at the Asset, or several times in Kenya O&G.	Between 1E-03 and 1E-02
E	**Frequent** • Similar event may occur at Asset every 1 to 10 years. • Has happened several times at Asset, or many times in Kenya O&G	Greater than 1E-01

Table 3-11 Risk Matrix, and Risk Tolerability Criteria

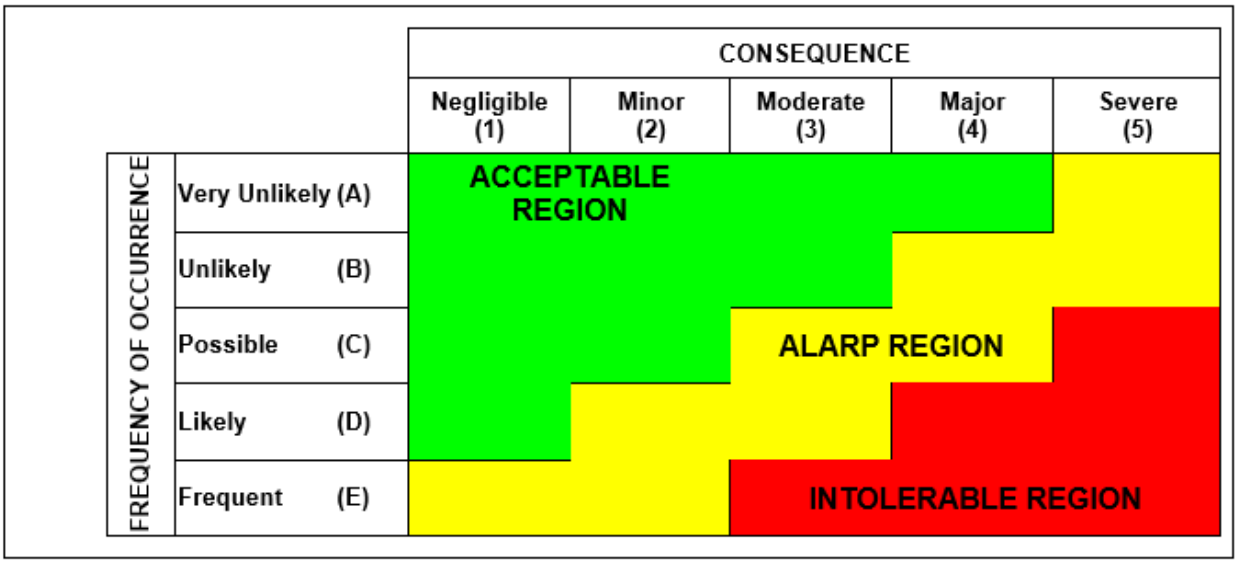

Table 3-12 Criteria for Risk Management

Risk Category	Risk Management Regime
Intolerable Region	The activity shall not be carried out, as the risk is intolerable/unacceptable. Adequate control measures shall be established (ex. regardless of cost-benefit considerations, i.e. compulsory) to bring the risk levels to at least "ALARP" before the activity can be performed. Such additional control measures must be in place before the activity can commence.
ALARP Region	The risk of the activity shall only be deemed as tolerable once it is demonstrated that all reasonably practicable risk reduction measures have been implemented, or if risk reduction is impracticable, or the cost of the risk reduction measures is grossly disproportionate to the improvement gained. The activity shall be further analysed to determine if any additional control measures are required. If required, such additional control measures shall be established before the activity can be performed.
Acceptable Region	The risk is acceptable. No additional control measures will be required.

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4 Tiered Response Planning

Kenya has adopted a tiered response system as the fundamental response structure for utilization of resources and for interfacing with government agencies, counties government, industry, contractors, subcontractors, and non-government organizations that could become involved during spill response. A tiered response system has the flexibility to expand in an organized and consistent fashion to address individual, regional, country, or trans-boundary emergencies. This tiered approach facilitates the rapid and orderly expansion of emergency response should it become necessary during a declared emergency.

The successful application of the tiered response system relies on a cascading of personnel, resources, and skills from the initial on-scene responders to international capabilities, as required. The transition from one tier to another requires insight to recognize the need to ramp up a response. The transition also requires effective communications and use of personnel as Tier 2 and 3 responders arrive to assist with the incident response. The main objective is to perform a seamless transition as the response escalates.

4.1 Tier Definitions

The response capacity for responding to a spill is based in the principle of Tiered Response, whereby:

Tier 1 is an accidental discharge occurring at or near a facility or asset (e.g., Onshore production field, tank-farm, pipeline), and with low or localized impacts to which local or in-house response capability is adequate. A Tier 1 response would be expected to be handled by the party responsible for the spill (RP); NEMA would provide guidance and monitoring. NEMA would respond where no responsible party is identified or capable of adequate response.

Tier 2 is a medium-sized spill that results from a non-routine event. Significant impacts are possible and external (other counties, companies, or cross jurisdictional resources) support for adequate spill response is required. A Tier 2 incident implies at least partial activation of this Onshore-NCP. For Tier 2 incidents the response would be handled both by the responsible party and NEMA, into a Unified Command structure (see Section 5.4.4) in coordination with other appropriate government agencies.

Tier 3 is a large spill that results from a non-routine event and requires substantial resources and support from national or world-wide spill sources to mitigate effects perceived to be wide-reaching, i.e. of national or international significance. In addition to the national criteria, any spill that threatens a neighbouring state is a Tier 3 incident. A Tier 3 incident implies full activation of this Onshore-NCP and likely the National Disaster Plan (NDP).

It is important to recognize that while the extent and size of a spill is relevant to the tier classification (response capacity), other factors such as environmental resources at risk, seasonal accessibility, and geographical remoteness also play a part. For this reason, this Onshore-NCP does not define tiers quantitatively as there are too many variables in a spill (e.g. oil type, location, environmental setting, weather) to calculate the amount and quantity of resources required by a given volume of oil spilled. NEMA is the lead agency to define tiers quantitatively for onshore and non-navigable water operations during the environmental impact and risk assessment process for each operation. For emergency preparedness purposes, NEMA has the authority determine the Tier 1 response resources each potential RP must have onsite, and the memorandum of understanding (MOU) or contractual agreement that the RP must have in place with oil spill response organizations (OSROs) for its Tier 2 and Tier 3 response capability.

Table 4-1 provides an example of the minimum response time and recovery capacity NEMA may require of a potential RP. Appropriate resources should arrive onsite within the tiered time allotted. The example scenario shown in Table 4-1 can be used by NEMA as a reference for preparedness efforts (scaling in and scaling up of resources) for clean-up (Section 8.6.2).

Table 4-1 Example of minimum response time, recovery, and containment capacity.

Response Time (hours)			Added Daily Recovery Capacity			Containment Boom (length in m)
Tier 1	**Tier 2**	**Tier 3**	**Tier 1**	**Tier 2**	**Tier 3**	
6	48	72	10%	15%	30%	300 plus 100 per skimming system to address the recovery capacity

Example**:**

- **Spill source:** Pipeline
- **Volume spilled:** 950 t (7,000 bbl)
- **Tier 1:** the local response team(s) should be operational on scene with enough equipment to recover 10% or 95 t (700 bbl)/day, within 6 hours;
- **Tier 2:** the OSRO should have enough equipment to recover 15% (143 t or 1,050 K bbl /day) additionally, within 48hr;
- **Tier 3:** the OSROs should have enough equipment to recover an additional 30% (28 t or 210 bbl/day), within 72 hr. The OSROs will continue to operate until the oil spill is cleaned up.

4.2 Spills Classification

For planning and communications purposes only, the categories described in Table 4-2 are used to communicate an approximate spill size, any of which may invoke a Tier 1, Tier 2, or Tier 3 response depending on severity of potential impacts and resources required for response.

Table 4-2 General spill classification

Classification	Spill Volume
To land or non-navigable (inland) waters	
Minor	<4 m^3 (25 bbls)
Moderate	4 to 40 m^3 (25 to 250 bbl)
Major	>40 m^3 (>250 bbl)

This Onshore-NCP recognizes the limited response capability available from local resources (outside of the Mombasa area) and that reliance must be placed on technical expertise, equipment, and personnel available that may be required from outside the local area (e.g., KPC personnel and contractors).

Due to the proximity of neighbouring countries (Uganda, Tanzania, Ethiopia, Somalia, and South Sudan) and the fact that a threat to one country may pose a threat to another, it is part of the policy of this Onshore-NCP to develop a good working relationship between the authorities of adjoining nations, with each country's Contingency Plan being held by the other. In the interest of reducing the impacts of a major hydrocarbon release that occurs close to a country's territorial borders, a rapid response agreement of equal right of access shall be established in the Kenya Regional Preparedness and Response Capacity Plan and aligned with other pertinent international response plans.

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5 Response Management Organization

Management of an oil spill incident should follow the approach and procedures outlined in this plan. An actual response organization will be incident specific and typically expands from the local Tier 1 team. The response management organization gains progressively more positions as the magnitude of the required response increases. **Each of the individuals assigned to key positions in the response management organization will have a set of responsibilities that they will review and address as appropriate to the response (Appendix H – IMT Roles and Responsibilities Checklists)**.

5.1 Levels of Response Organization

There are three fundamental levels of spill response organization: an Onsite Response Team (ORT), a Local Incident Management Team (Local-IMT), and the National Incident Management Team (National-IMT). Figure 5-1 illustrates a modular development expanding the response organization from a small ORT to a Local-IMT and then to a partial National-IMT.

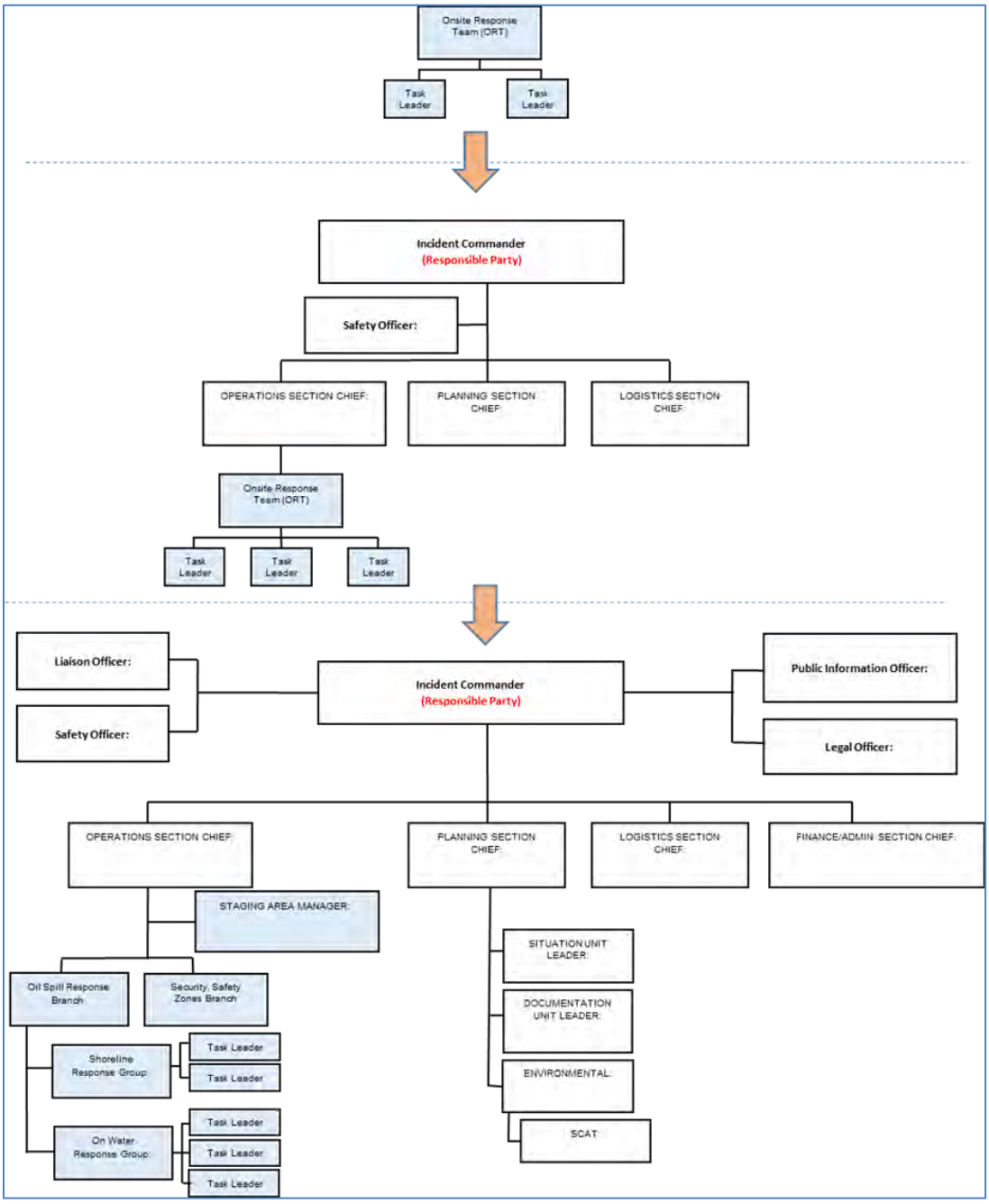

Figure 5-1 Modular development example of a response organization; blue functions show example of ORT positions.

Any of the three types of response organizations must be able to expand and contract as appropriate for the scope of work needed to address any type of hydrocarbons release.

The tactical ORT level is the team conducting onsite response operations (such as source control, equipment deployment, etc.) for any hydrocarbons release response. The other two levels are management response teams: a Local-IMT, for minor or moderate events, and the National-IMT, for incidents of national significance. Both IMTs provide strategic guidance to the ORT. To aid in the phased commitment of spill response resources, the severity classification introduced in Section 4 can also be used to identify response teams that are most likely to respond to an incident:

Minor: A minor incident can be handled exclusively by an ORT by implementing a facility response plan, usually including only members of the RP or a local oil spill response contractor. NEMA would only respond to minor events where no RP is identified or capable of adequate response.

Moderate: A moderate incident has broader impacts, requires strategy management, safety considerations (e.g., mustering, shelter in pace, evacuation), acquisition of resources not immediately available to the ORT, and the coordination of a Local-IMT (including members of the RP's or affected facility). If satisfied with the Local-IMT performance, NEMA, as the lead agency, may only supervise and monitor the Local-IMT effectiveness. Otherwise, NEMA could take over the command and coordination of the response.

Major: Major incidents cannot be handled exclusively by the RP and require the activation of a National-IMT, led by NEMA. A National-IMT usually involves the activation of a multidisciplinary team (including RP, agencies, county government(s), and other public and private stakeholders) into the specific IMT sections. A major incident may also trigger the activation of other agencies (e.g., KMA, NDOC, KPA, NEMA Board of Directors).

If the severity of an incident escalates and triggers the activation of the National-IMT, NEMA may absorb members of the Local-IMT as needed to manage response activities in support of the ORT. Table 5-1 summarizes the relationship that exists between the severity of a spill and the response team that may be activated.

Table 5-1 Response teams that may be activated depending on the spill severity

Severity of the Spill	ORT	Local-IMT	National-IMT	NEMA Board of Directors
Minor	YES	TENTATIVE		
Moderate	YES	YES	TENTATIVE	
Major	YES	Incorporated into the National-IMT	YES	TENTATIVE

Multiple stakeholders (e.g., agencies, local government, RP management teams) may be notified during emergency events (Section 2); response teams are activated as needed and appropriate to respond to the emergency.

5.2 Spill Response Governance

The Lead Agency for responding to an onshore oil spill in Kenya is NEMA. A National-IMT is activated when there is a major (Tier 2 or 3) threat of pollution (Table 5-2). NEMA will have overall responsibility for coordinating the response effort. If NEMA determines the local or RP's Tier 1 or Tier 2 response is fully capable of managing the response, then NEMA's role would be to supervise their Tier 1 or Tier 2 response operations.

Table 5-2 Spill response governance

Response Team	Led by	Reports to
ORT	On-Scene Commander (OC)	IMT Operations Section IMT
Local-IMT	Incident Commander (IC) or Unified Command (UC)	NEMA (in coordination with the RP's Management Team)
National-IMT	UC	NEMA Board of Directors

The ORT conducting field operational or tactical activities onsite could consist of:

- RP spill team and contractors,
- the Kenya Fire Department and NDOC (for on land spills), or
- a designated OSRO.

The command and field operational activities during a minor incident (Tier 1), **if no RP is identified**, will be a joint support from either:

- NEMA,
- the Kenya Fire Department (for minor Tier 1 spills on land), or
- a designated oil spill response organization (OSRO) (e.g., the OSMAG Society)

Moderate and major incidents requiring multi-jurisdiction coordination of Tier 2 or Tier 3 resources may activate a Unified Command (UC), formed by NEMA, a qualified person from the RP, and a local authority such as the NEMA regional representative or a county authority.

For spills that originate on land and that reach the marine coastal environment, NEMA may shift primary operational support from the local Fire Department or NDOC to the Kenya Coast Guard, Kenya Port Authority, or KMA as deemed necessary and appropriate.

5.3 Responsibilities

Government agencies have specific roles within the Kenya National Disaster Response plan (NDRP), which generally are also applicable to their function in a major spill incident (Table 5-3). The roles and support these agencies provide may be through direct assigned roles within the National IMT or

indirectly through supporting efforts with the Liaison Officer assigned to the National IMT (see examples of specific roles in Figures 5-2 through 5-4).

Table 5-3 Example of lead government agencies for various hazards (Modified from Table 10 National Disaster Response Plan)

Hazard Threat	Lead Agency/Dept.	Support organizations
Oil and HNS Spill (Onshore)	NEMA	Ministry of Environment, KMA, Ministry of Labour, Kenya Fire Services, Kenya Wildlife Services, National Disaster Operation Centre, Police, KPA, Kenya Maritime Authority, Ministry of Environment, Ministry of Water, Ministry of Health, Kenya oil Refineries, National Oil Cooperation of Kenya, Kenya Pipeline Company, Research, Institutions, UN Agencies Private sector,
Crisis (bomb threat, bomb explosion, terrorist attacks, hostage taking, stampede and crowd related incidents, demonstrations)	Police, MOD	NDOC, Bomb Disposal unit, Fire Brigade, Community, Kenya Red Cross Society, Kenya Scouts Association, Min. of Health, St. John Ambulance, UN Agencies Private sector
Fire (Urban / Rural)	Local Authority	National Disaster Operation Centre, Min. of Local Authorities, Kenya Wild Life Service, Ministry of Environment, MOD, National Youth, Kenya Red Cross Society, St John Ambulance, Kenya Scouts Association, Kenya Police, Community, Public Works, Forest Department, UN Agencies, Private sector, Community Organizations
Major Transport Accident – road accidents	Police (Traffic Dept.)	National Disaster Operation Centre, National Youth Service, Kenya Red Cross, Fire Brigade, Ministry of Health, Kenya Scouts Association, Min of Transport, Min of Roads and Public Works, Community, St John Ambulance, Private sector,
Major Transport Accident – rail accidents	Police/Kenya Railway	National Disaster Operation Centre, Police, National Youth, Fire Brigade, Min. of Health, Min of Transport, Community, Kenya Red Cross Society, Boy Scouts Association, St John Ambulance, UN Agencies, Private sector
Major Transport Accident – aviation accidents	Civil Aviation Authority	National Disaster Operation Centre, Police, MOSD, Fire Brigade, Ministry of Health, Community, Min of Transport, Kenya Air Force, Kenya Red Cross Society, Kenya Scouts Association, Ambulance Service, UN Agencies, Private sector

5.4 Organizational Structure

The National-IMT organizational structure for a major Tier 2 or 3 spill response follows the principles of the Incident Command System (Figure 5-1). The ICS is a standardized and modular approach to managing critical resources and response efforts in an effective and consistent manner. ICS has been implemented as an all-risk, all-hazard management approach in the Kenya National Disaster Response Plan and for oil spills, hazardous materials spills, terrorist attacks, and natural disasters around the world. The use of one common system ensures that participating responders understand the terms, responsibilities, and process through which an incident is managed.

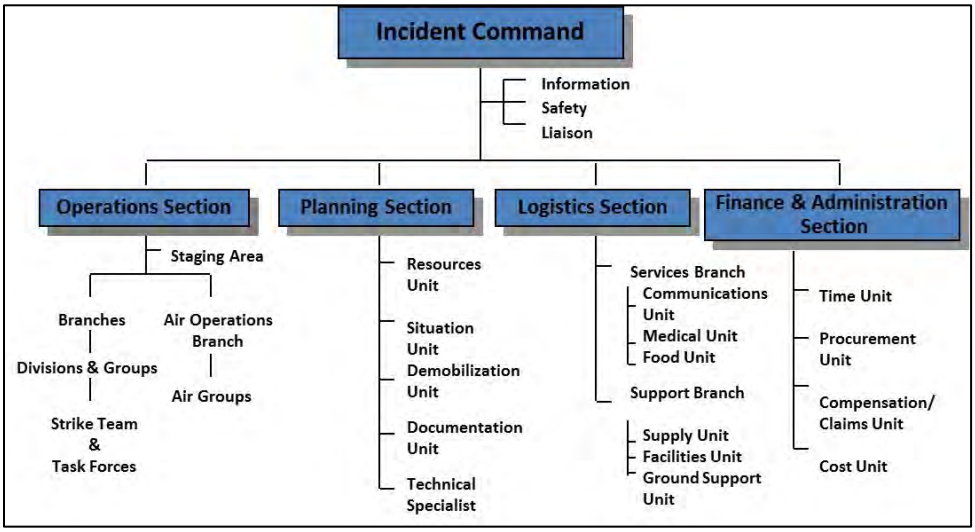

Figure 5-2 Overall structure of an Incident Command Team

Fundamental ICS concepts that make it an effective tool for spill response include:

- Flexible and adaptable- the organization can grow and contract, as needed. Only those functions required for incident response are activated, which allows the concepts to be used for small to very large and complex spills.
- Defined lines of communication- the organization of the ICS team is built from the Incident Commander down. The first on-scene is the initial Incident Commander until that responsibility is assumed by another individual. For all spills, there is only ONE Incident Commander or Unified Command, but that responsibility can be assumed by different persons during the course of a response.
- Common terminology – spill responders use consistent terms in team organization, field organization, and in communications.
- One incident action plan- All participating responders and interest groups are integrated collaboratively within the ICS framework. From this collaboration, a single incident action plan sets the response objectives, strategies, and tactics that will be implemented.

Agencies assigned to key roles in the IMT in this Onshore-NCP are aligned to areas of responsibility under the NDRP. Figure 5-2 provides a template for assigning key roles in the IMT to be used in the

event of an emergency. Figures 5-3 and 5-4 show potential participating entities at the command and general staff levels of the ICS organization for major spill response, respectively. Only positions that are required for an adequate response need to be filled and the IMT should be kept as small as possible but sufficient to accomplish the response objectives and monitor progress.

5.4.1 Unified Command

An oil spill or release of a hazardous substance is a single problem, requiring a single, highly-focused emergency response effort. Constructing such an effort can be difficult when multiple organizations exist with the authority to launch simultaneous, potentially divergent emergency response operations. When a major (Tier 2 or 3) response requires a multi-agency or multi-jurisdictional approach, the leadership of an IMT may be expanded from a single IC into a Unified Command (UC). The UC structure is created at the time of an incident to bring together the "Incident Commanders" of each major organization involved in the emergency response operations, led by lead agency (NEMA).

The UC is a structure that brings together the representatives of NEMA and any other major organization involved in the incident in order to coordinate an effective response (only one incident action plan or IAP), while at the same time allowing each organization to carry out their own jurisdictional, legal, and functional responsibilities. Two or more agencies could assemble a UC including, but is not limited to:

- The pre-designated lead agency for Onshore spill response (NEMA),
- The local authority (e.g., KPC for pipeline incidents)
- The representative of the RP (e.g., Tullow), and
- The county government, as appropriate.

In the event that the UC is unable to reach consensus, the lead agency (NEMA) has ultimate decision-making authority.

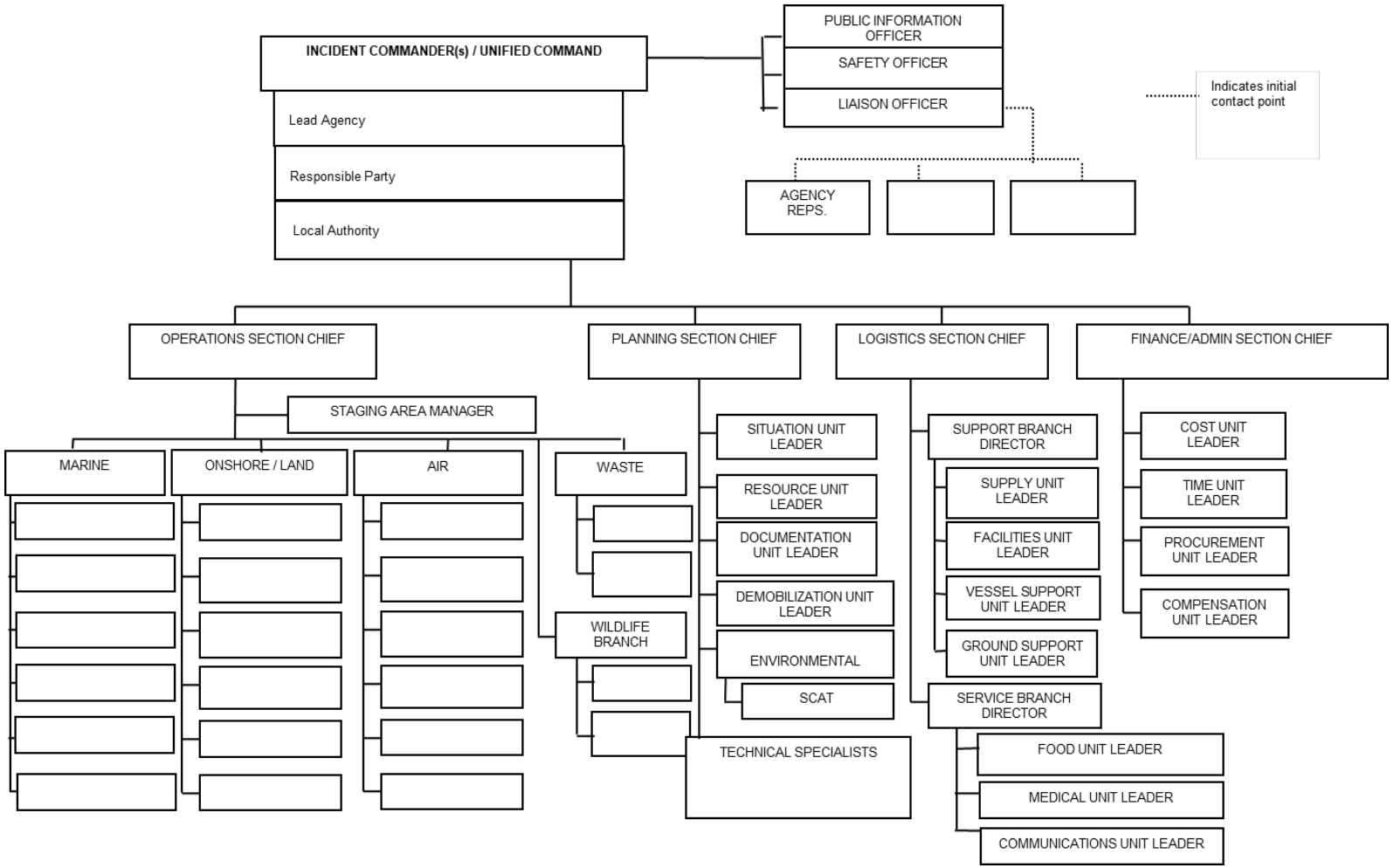

Figure 5-3 Template for assigning key roles in the National IMT

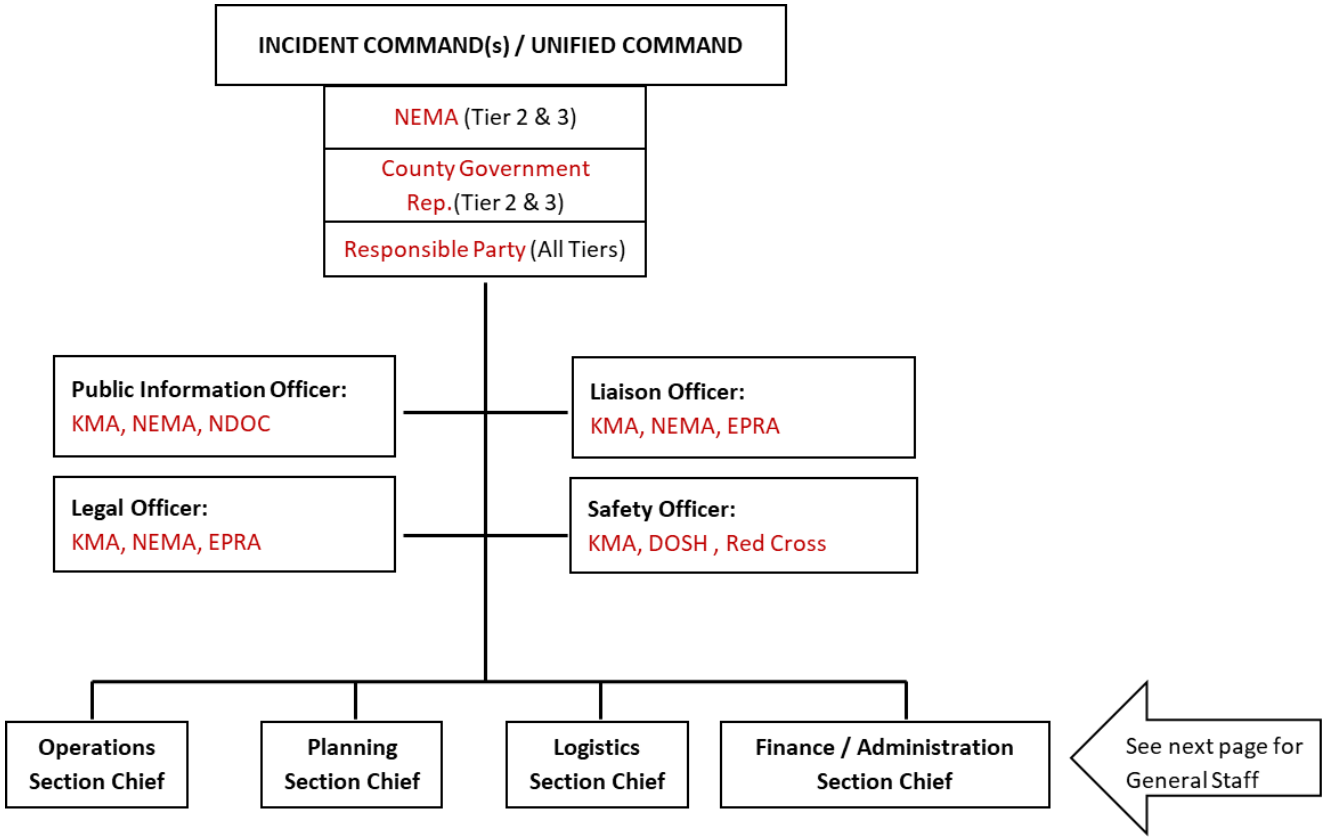

Figure 5-4 Example of the Command Staff of the National IMT

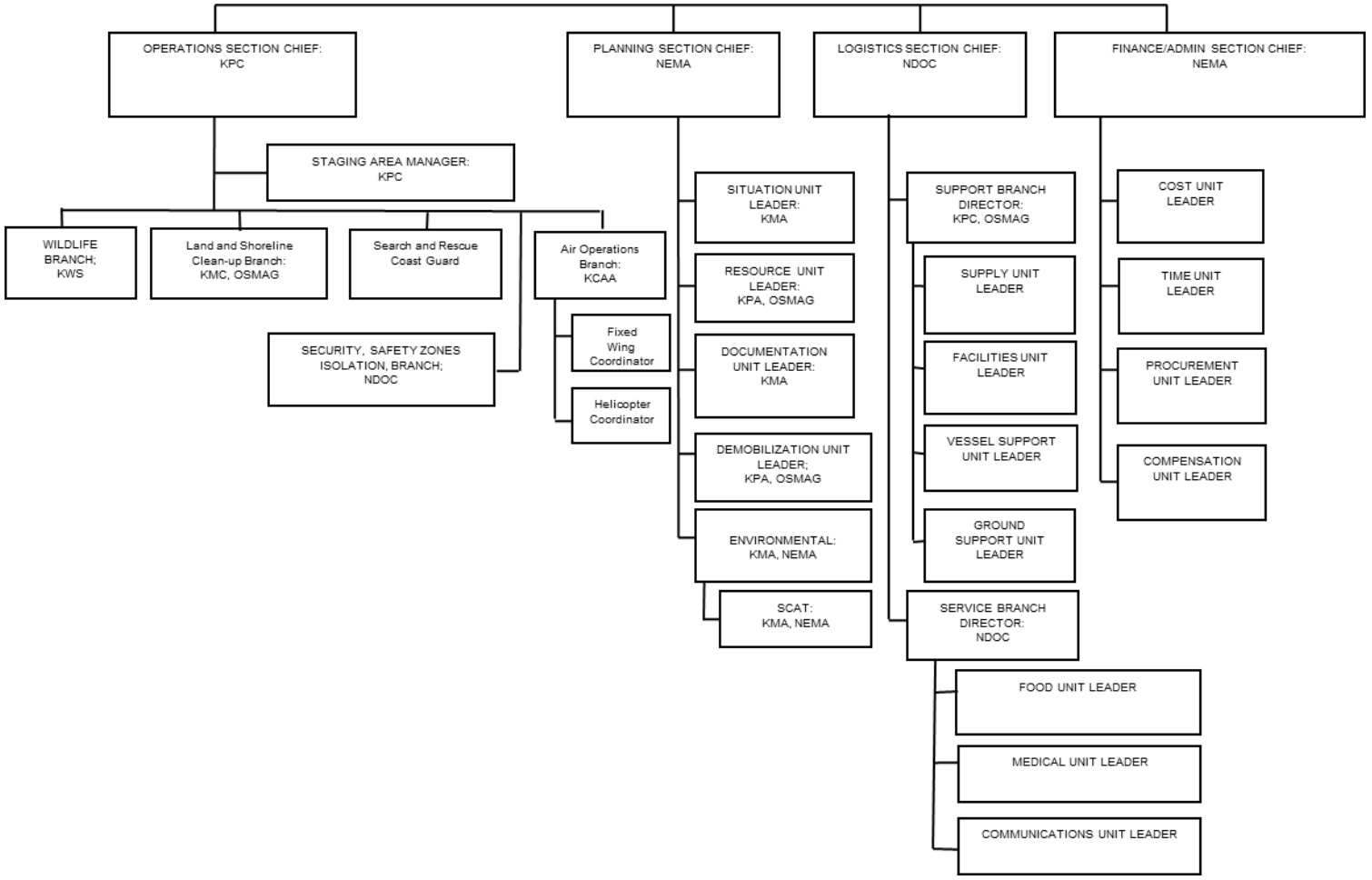

Figure 5-5 National IMT General Staff example of a multidiscipline incident (multiple disciplines in the Operations Section as Branches)

5.5 Position Descriptions

Roles and responsibilities for the personnel assigned to the IMT are described briefly in the following sections. Additional guidance for roles, checklists, and coordinating actions during the response and identifying and meeting response objectives are provided in **Appendix H – IMT Role Checklists**. Personnel assigned to an IMT should prepare or compile job aids and checklists to undertake their duties within the incident command process. A single person may be assigned to more than one position and should review the role descriptions and checklists for all of the positions to which they are assigned or responsible.

5.5.1 Incident Commander or Unified Command

The Incident Commander or the Unified Command assumes overall responsibility for the management of the emergency response operation, including such personnel as required to perform, or support, the command function. The IC of the National-IMT will maintain contact with the Board of Directors to keep officials apprised of the incident status, the IMT performance, and, if needed, to extend financial authority limits.

Other major responsibilities of the IC or UC are:

- establishing strategic response objectives
- establishing response priorities
- reviewing and approving tactical plans developed to address objectives and priorities,
- ensuring the full integration of emergency response resources, and
    - resolving multi response agency conflicts,
    - handling external management relations,
    - preparing situation status reports,
    - handling community media relations, and
    - establishing a response daily schedule.

5.5.2 Deputy Incident Commander

The Incident Commander may assign a deputy. The Deputy Incident Commander will coordinate and supervise the response operations. He/she will communicate on behalf of the Incident Commander with all response personnel and serve as the link between the Incident Commander and the response personnel. He/she will assume the role of Incident Commander in situations when the Incident Commander cannot continue to serve for any reason, and has complete authority over response personnel at the spill scene as directed by, or in the absence of, the Incident Commander.

5.5.3 Safety Officer

The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures to assure personnel safety (see Section 2.3.2). This includes establishing, maintaining, and providing for emergency medical services, and developing a Site Safety and Health Plan. The Safety Officer maintains awareness of active and developing situations, and includes appropriate safety messages in each IAP. He/she advises the Operations Section Chief and the Deputy

Incident Commander on proper safety and health practices and monitors compliance with industrial hygiene regulations. The Safety Officer should be well versed in safe operation practices as well as have a basic knowledge of first aid.

The Safety Officer will correct unsafe acts or conditions through the regular line of authority, although the Safety Officer may exercise emergency authority to prevent or stop unsafe acts when immediate action is required.

5.5.4 Public Information Officer

The Public Information Officer (PIO) is responsible for developing and releasing information about the incident to the news media, to incident personnel, special interest groups, and to other appropriate agencies (including their Board of Directors) and organizations. This includes development of necessary distribution literature, scheduling of all news conferences and public meetings, and acting as chief facilitator and spokesperson during these events. He/she handles all public affairs matters with the Incident Commander and the Deputy Incident Commander, and works with Unified Command representatives in the formulation of a Joint Information Centre (JIC). The Information Officer may have assistants, as necessary.

5.5.5 Liaison Officer

The Liaison Officer is the point of contact for the assisting and cooperating agency representatives and stakeholder groups. He/she is responsible for advising the Incident Commander on liaising with the various government agencies involved, both national and foreign. The Liaison Officer works with Legal to ensure that relevant regulations and agreements are being followed and permits are being obtained. He/she assures that operations are not at variance with the Regional Response Plan or other conventions and agreements.

5.5.6 Legal Officer

The Legal Officer acts in an advisory capacity during an oil spill response to advise the Incident Commander and staff on legal issues relating to laws and regulations, financial issues and claims, and implications of proposed plans of action.

5.5.7 Operations Section Chief

The Operations Section Chief is responsible for managing all operations directly applicable to the primary mission of spill control, containment, and clean-up. The Operations Chief activates and supervises elements in accordance with the IAP and directs its execution; activates and executes the Site Safety and Health Plan; directs the preparation of unit operational plans; requests or releases resources; makes expedient changes to the IAP as necessary; and reports on all field activities to the Incident Commander. The Operations Chief is responsible for all field operations and delegates responsibility to a number of Branch Managers and/or Field Supervisors.

5.5.8 Planning Section Chief

The Planning Section becomes the organizational focus for all information or intelligence relative to the incident. The Planning Section Chief, a member of the General Staff, is responsible for collecting, evaluating, disseminating, and using information about the incident and status of resources. This element is responsible for maintaining and understanding current situations status, as well as looking ahead at probable future incident developments (e.g., weather forecasts, spill trajectory models, areas at risk), and provide information to prepare alternative strategies for the incident. The Planning Section Chief ensures meetings are held as scheduled and are coordinated with the Incident Commander. He/she spearheads the preparation of an IAP, daily or as required.

5.5.9 Environmental Unit Leader

The Environmental Unit Leader works within the Planning Section to administer environmental affairs, including confirming mandatory regulatory agency notification has been completed, technical environmental expertise is available as required, and that response actions and decisions are aligned with environmental regulations. The Environmental Unit team monitors the effectiveness of the spill response, advises on the ecological impacts of the spilled material, evaluates trade-offs and net environmental benefits of treatment and clean-up methods, coordinates the SCAT team (see National Guide for Using the Shoreline Clean-up Assessment Technique), collaborates with the Wildlife Branch (see National Guide for Oiled Wildlife Response), and monitors recovery.

5.5.10 Logistics Section Chief

The Logistics Section Chief is responsible for providing facilities, services, and material in support of the incident response and for seeing that adequate manpower, equipment and supplies are available to perform the necessary response operations. He/she must see that food, shelter, protective clothing, transportation, communication, and first aid facilities are available for all personnel requiring such assistance. The Logistics Chief participates in developing and implementing the IAP and activates and supervises Branches and Units within the Logistics Section.

5.5.11 Finance/Administrative Section Chief

The Finance Section Chief is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance/Administration Section. He/she must be well versed in the government's accounting practices. He/she keeps track of all payments, receipts, contracts, etc., as the response progresses. In coordination with the Planning Section Chief and the Documentation Unit, the Finance Section Chief ensures that evidence and documentation of actions and expenditures are maintained for possible restitution of claims from insurers or pollution funds.

5.6 Incident Command Posts and the Emergency Operations Centre

The On-Scene Commander (OC) of the ORT (Tier 1) or the IC of a Local IMT (Tier 2) shall designate the specific location for the Incident Command Post (ICP) from where he or she will lead the response. The ICP is located close to, but a safe distance from, the incident scene. For spills of national significance, upon receipt of notification (see Section 2) and confirmation that a National-IMT is required, staff with

assigned roles in the National-IMT organization shall mobilize to the designated Emergency Operations Centre while the OC of the ORT continues operating from the ICP. The EOC must provide sufficient room, access, ingress/egress control, and logistical support to the IMT.

5.7 Use of Volunteers

The use of volunteers during an oil spill response presents many challenges, including: legal liability, safety, technical training, logistics, and reliability. Human health and safety is the first priority and must be accounted for prior to and during any activities designated to a volunteer work force. To incorporate volunteers productively into the response workforce requires strategic planning and proper management with the county governments to ensure the safety of responders and prevent adverse public and political reaction. Volunteers may be transferred to the labour pool upon training, instruction, and working under proper supervision.

During the initial response the IMT structure may not contain positions specifically dedicated to volunteer management. As the Unified Command becomes aware of volunteer interest, the UC should assign a Volunteer Coordinator within the IMT, typically as part of the Liaison Officer's group.

Volunteers may arrive as individuals, or as part of an established organization. Two major categories for volunteers are:

- Affiliated volunteers are individuals associated with an affiliated volunteer organization and have usually received sufficient training to allow them to contribute to their host organizations, though may not be trained in spill response. Affiliated Volunteer Organizations:
    - Hold a non-profit status and provide some form of training
    - Maintain an affiliated volunteer database
    - Have volunteer functions to facilitate current volunteer experience and communication
    - Accept donations of money or materials
- Non-affiliated volunteers are persons interested in participating in the response effort, but are not part of an existing organization and may have little or no oil spill response training.

Based on conditions specific to the incident, the UC will determine the suitability of integrating volunteers, whether affiliated or non-affiliated, into the spill response.

Key considerations for using volunteers are:

- Volunteers often have a short-term commitment and potential unavailability to complete tasks fully
- Require additional supervision, safety induction training, personal protective equipment (PPE), and training for assigned tasks
- Motivation may be challenging in the event of a slow and repetitive shoreline clean-up
- Due to lack of awareness and expertise, volunteers have the potential to generate more waste than contracted clean-up workers

- Additional effort may be required to ensure clear understanding of priorities, objectives, resource requirements, organization and communication.
- Communications with the public, press, media, and other organizations external to the response are uncontrolled through volunteers.

Tasks most suited for use of volunteers, all under close supervision, are:

- Support logistical services, such as transportation, food, and housekeeping at staging areas
- Shoreline pre-cleaning and clean-up for low risk areas
- Assist with support to wildlife rehabilitation and recovery operations.

Steps for incorporating volunteers are:

- Liaison Officer decides whether it is suitable to use volunteers on the response and requests Unified Command approval
- Liaison Officer in coordination with Safety, Operations and Planning determines tasks in which volunteers will be involved
- Safety Officer ensures volunteer induction and training program has been established and that any volunteer assigned to assist with the response receives and understands the training
- Operations Section Chief and Safety Officer:
  - identifies the additional support and resources required (including PPE) for volunteers in the IAP filed task assignments (ICS-204 form) and Site Safety Plan (ICS-208 form)
  - ensures volunteers are assigned with trained supervision
- Volunteers must go through a debriefing with their direct Supervisor upon conclusion of their assignments and prior to demobilization
- Documentation Unit to receive and file debriefing summaries

Additional information on the use of volunteers during a response can be found at:

- Preparedness for Oil-polluted Shoreline clean-up and Oiled Wildlife intervention (POSOW). Oil Spill Volunteer Management Manual. Accessed at: http://www.posow.org/documentation/manual/volunteersmanual.pdf
- IPIECA-IOGP 2015, Volunteer management guidelines and best practices document. Accessed at: http://www.ipieca.org/resources/case-study/volunteer-management/

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6 Hydrocarbon Release Incident Assessment

Proper size-up is required to effectively mobilize the personnel, equipment, and expertise to deal with hydrocarbon release events of national significance. Monitoring the site where the hydrocarbon release occurred is essential to determine the concentrations of contaminant(s) present (e.g., oxygen deficiency, flammability, and toxicity), establish evacuation criteria, and to maintain an isolation perimeter; see Section 2.3.2 Safety assessment.

Some of the first steps in response require careful assessment of a spill situation followed by regular updates if a spill threatens public or environmental sensitivities. The assessment process includes the following sequence of steps:

1. Identify spilled material and safety hazards to personnel, contractors and the general public
2. Evaluate the properties of the spill/release as they influence movement, recovery, and environmental effects
3. Estimate spill size and movement
4. Evaluate level of Emergency Response Team activation
5. Establish response priorities
6. Evaluate if the spill is of suspicious origin

6.1 Spill Characterization and Volume Estimation

The type of hydrocarbon release (including crude oil and refined products classified as HNS) should be identified early as part of the health and safety evaluation (see Section 2.3). The volume spilled also should be estimated using as many methods as possible. These volume assessment methods could include:

- the rate of flow through a well or a pipeline and the duration of release before shutoff,
- the size and number of storage tanks breached, or
- the colour and size of slicks on water.

The Shoreline Clean-up Assessment Technique is a standardized process for systematically documenting oiling conditions on shorelines, river and stream banks, and on land. The SCAT process is a responsibility

of the Environmental Unit (within the Planning Section) of the IMT organization. A rapid assessment, such as the aerial overflights, may be recommended initially in order to quickly identify major oil concentrations, concerns, and priorities along shorelines, river and stream banks, and on land. The SCAT Coordinator should convey the specific locations of priority areas and recommended clean-up procedures as part of the response planning process. Guidelines for conducting SCAT are described in the National SCAT Guideline Plan.

Basics steps in the SCAT process include:

- Divide the oiled and potentially oiled area to be surveyed into segments or areas with relatively uniform characteristics and oiling conditions
- Determine dimensions of the oiled area
- Determine the oil distribution or percent of the surface within an area covered by oil (see Figure 6-1)
- Determine oil thickness according to SCAT criteria: thick or pooled oil, cover, coat, stain, film

A general approach to estimate the volume of oil on land consists on multiplying the oiled area by the oil distribution or percent and by the oil thickness according to SCAT criteria; see National SCAT Guidance Manual.

For spills on water, estimating oil volume based on the colour and size of slick is often complicated by the complexity of slicks, their geometry, oil type, and other factors. Table 6-1 provides a general relationship between oil appearance on water and oil volumes. Trained and qualified observers should consider the following criteria when estimating slick volumes:

- Slick thickness varies considerably, especially if it appears dark brown or black; most of the oil is located in the darker areas of the slick
- Coloured or silvery bands indicate very thin slicks
- The percent distribution of oil colours in slicks provides improved volume estimation (Figure 6-2).

Figure 6-1. Visual aid to estimate surface oil distribution. From Kenya National SCAT Guidance Manual

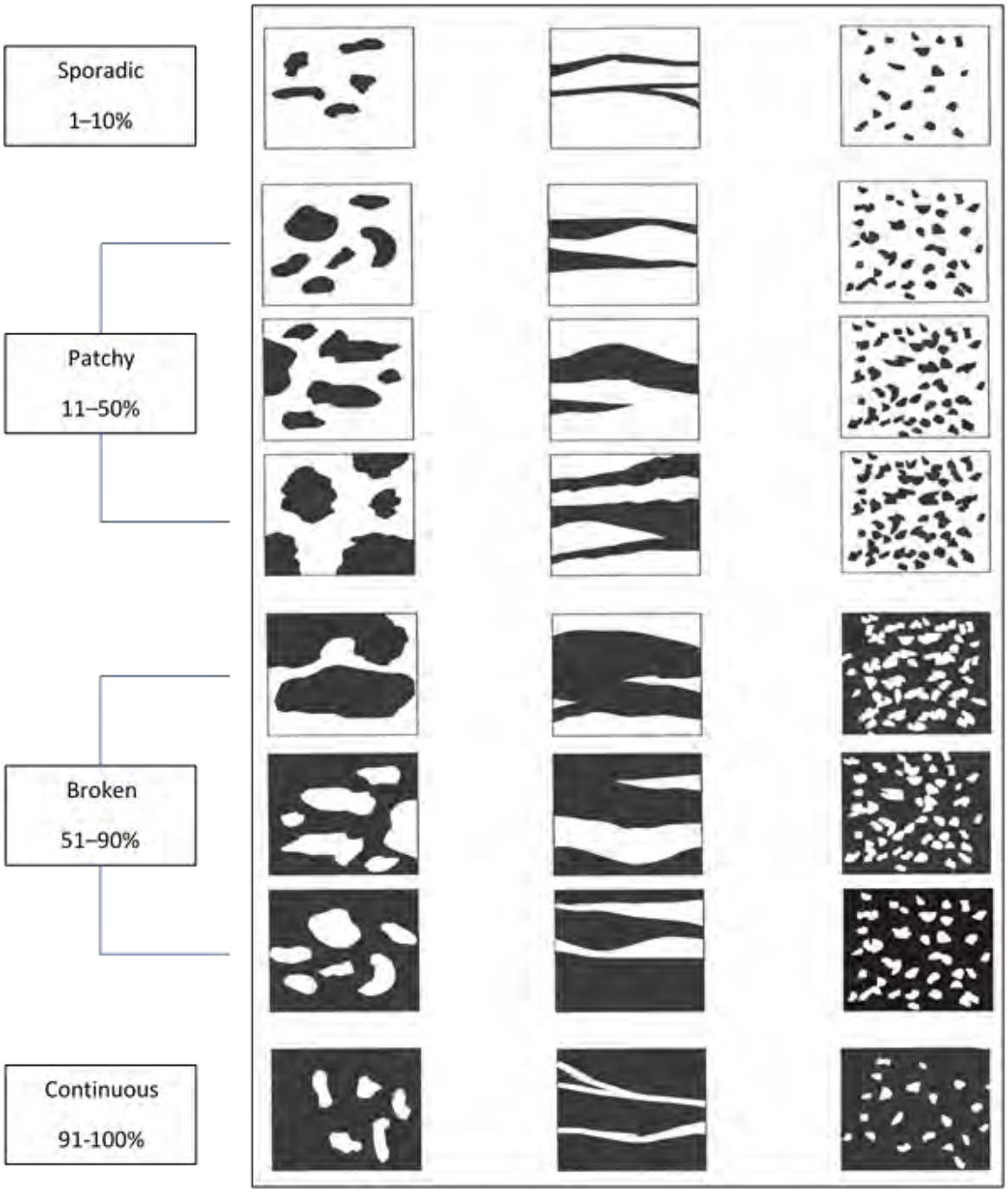


Table 6-1 Oil thickness and slick coverage area for oil on water per appearance code (modified after the BAOAC)

Code	Description Appearance	Layer Thickness (µm) *	m^3 per km^2	bbl per km^2
1	Sheen (silver/grey)	0.04 to 0.3	0.04 to 0.3	0.25 to 1.9
2	Iridescent	0.3 to 5.0	0.3 to 5	1.9 to 31.5
3	Metallic	5.0 to 50	5 to 50	31.5 to 314.5
4	Discontinuous True Oil Colour	50 to 200	50 to 200	314.5 to 1258
5	Continuous True Oil Colour	more than 200	more than 200	more than 1258

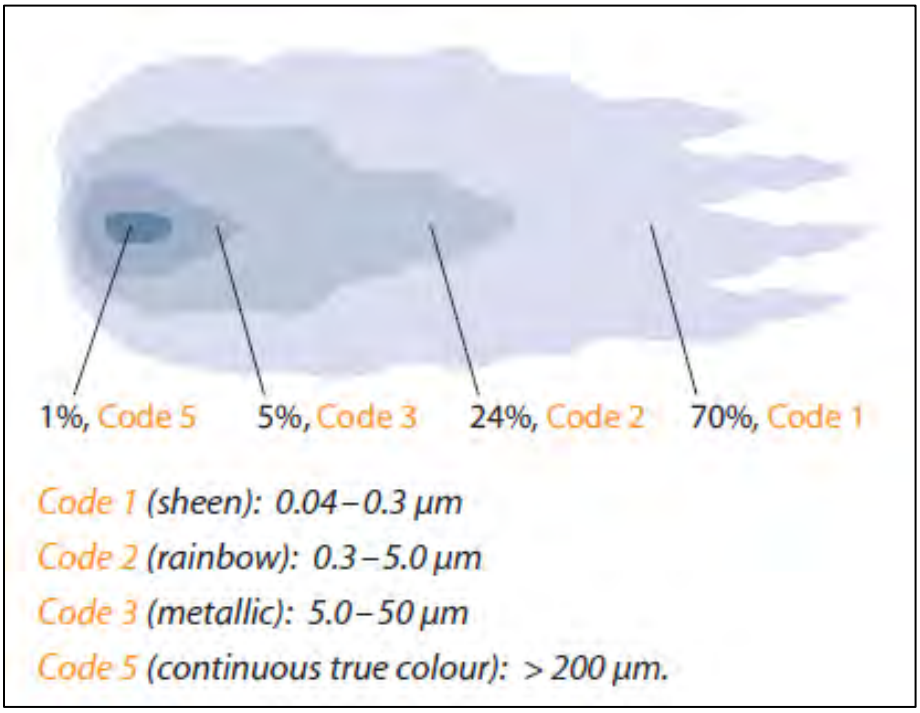


Figure 6-2 Example characterization of oil slick appearance on water. Source IPIECA-OGP (2015) – Aerial observation of oil spills at sea, Good practice guidelines for incident management and emergency response personnel

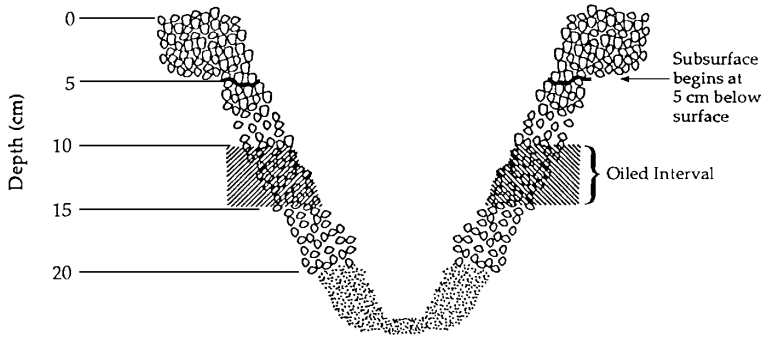
6.1.1 Subsurface Oiling Description

Standardized approach to characterized subsurface oiling conditions should also be followed (Kenya National SCAT Guidance Manual).

The following definitions have been developed to address potential problems associated with differentiating between what is considered surface and subsurface oil:

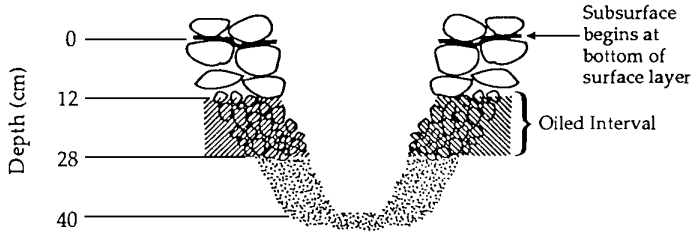
Fine Sediments (Pebble, Gravel, Sand, Mud)

The subsurface begins at 5 cm in oiled finer-grained materials. In a pit which has continuous oiled substrate from the surface down to 20 cm, the upper 5 cm is classified as surface oil and the remainder as subsurface oil. The oiled interval is recorded as 0 to 20 cm. In the following example the oiled interval is 10 – 15 cm.



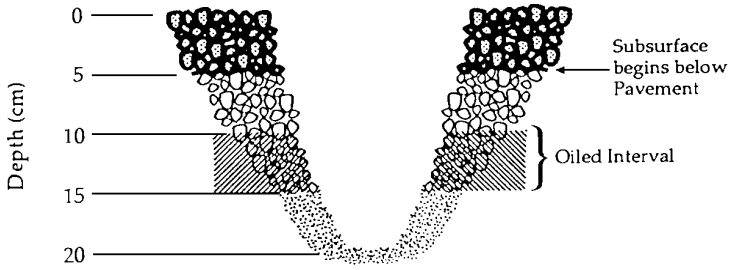
Coarse Sediments (Cobble, Boulder)

The subsurface begins where the top layer of cobbles or boulders contact the underlying layer of sediments.



Asphalt Pavement

Where AP exists on the surface, the subsurface begins at the bottom of the pavement, irrespective of pavement thickness.



6.2 Spill Tracking, Trajectory and Surveillance

Knowledge of the position of spilled oil and an ability to forecast its movement are essential components of any spill response. This function is known as surveillance and tracking, typically assigned to the Planning Section, and has three main components:

- Identifying the location of the oil using visual observation
- Identifying the location of potential sources near oil location (e.g., pipelines, truck-tanks, storage facility)
- Identifying the location of the oil using remote sensing techniques; in some cases, canine oil detection can also be used.
- Calculating and predicting the motion of the oil, generally using a computer program

Surveillance and tracking are expected to be done for all major spills and any that reach water. Table 6-2 describes potential surveillance methods for Tier 1, 2, and 3 spills.

Table 6-2 Oil spill tracking methods

Method	Tier 1	Tier 2	Tier 3
Visual Observation from Small Boats (inland waters)	√	√	√
Visual Observation from Aircraft	√	√	√
Aerial Drone (Video/Photo) Camera	√	√	√
Computer Modelling		√	√
IR Sensor			√
UV Sensor			√
Satellite imagery			√

Visual observations of oil from the air will be reported using a standard format on a map. The Aerial Observer's record form shall be used for documenting oil tracking and monitoring. Key considerations for spill observers are:

- Visual observations are hand-recorded on the map using a standard notation
- A Global Positioning System (GPS) device is used to accurately position surveillance observations.

Record the following during surveillance:

- Date and time of observations
- Name(s) of observer(s)
- Over-flight route
- Locations of areas with heavy oil concentrations
- Locations of oil patches and extent of sheen
- Apparent slick movement direction
- Weather conditions, including wind speed and direction, visibility, and cloud conditions
- Location of transportation routes, access points, and local landmarks
- Wildlife in the area
- Locations of deployed response equipment

6.3 Sample Collection

Oil samples may be collected for later analysis during response to a Tier 2 or Tier 3 incident. Reasons for taking samples include aspects such as legal matters to provide liability, operational samples to check spill source if in doubt, post-spill monitoring samples, and potential toxicity and persistence. A sampling plan should be developed within the IMT Environmental Unit, by NEMA as EU Leader in coordination with the DOSHS. Sample collection guidelines are:

- Oil samples should be collected from the source of the spill and from key concentrations of oil in the environment.
- Source samples should be collected as soon as possible after the incident to help characterize the spilled oil.
- Field samples should be collected to characterize the oil that has impacted shorelines or sensitive areas.
- All samples for chemical analysis must be collected in chemically clean jars, sealed, labelled, and kept refrigerated until processed in the laboratory.
- Chain-of-Custody forms (generally provided by the lab conducting analyses) must be initiated by the person collecting the samples and maintained through delivery to the laboratory.

Specific lab analyses to be performed will depend on the situation and needs to be established at the time of the incident. Accredited laboratories, to be recommended by Technical Advisors and/or NEMA at the time of an incident, would be used for all analyses.

Chemical analyses that may be requested include:

- BTEX - Benzene, toluene, ethyl-benzene, and xylene concentrations typical for light refined products
- C1 thru C6 - Light-end alkanes
- Fingerprint - Full gas chromatography/mass spectroscopy (GC/MS) for hydrocarbons and metals
- PAHs - Poly-Aromatic Hydrocarbons
- TPH - Total Petroleum Hydrocarbons

Immediately deliver samples to an approved laboratory for analysis. Samples should be analysed for volatiles and semi-volatiles and other methods of fingerprinting.

If the samples cannot be delivered immediately, they should be temporarily stored in a refrigerator or a cool, dark place since exposure to heat and light could affect analysis. Samples should be transported in a waterproof container or wrapped in enough sorbent material to soak up the entire contents of the jar in case of leakage or breakage.

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7 Response Resources and Logistics

Oil spill response resources include specialized equipment to monitor air quality, contain and collect oil, clean-up oiled areas, and treat oil on water and on shorelines. A key consideration in spill response planning is to ensure that appropriate resources are available to respond immediately to minor spills (Tier 1) and to cascade resources to locations needed in order to mount a Tier 2 or 3 response, as needed.

Note: Specialized resources may also be required for salvage, firefighting, hazardous materials response, and other specific hazards identified by the Safety Officer, but are not addressed in this Onshore-NCP.

NEMA (in coordination with KMA as the lead agency for the Marine-NCP) maintains an annually updated national inventory of oil spill response resources. The minimal equipment available in country, located primarily in Mombasa, is owned by KPA, KPC and private organizations (through the OSMAG Society) for responding to minor and moderate scale spills at their facilities (Figure 7-1).

A complete list of the equipment available from government and private sources is provided in Appendix C – Spill Response and Logistical Resources.

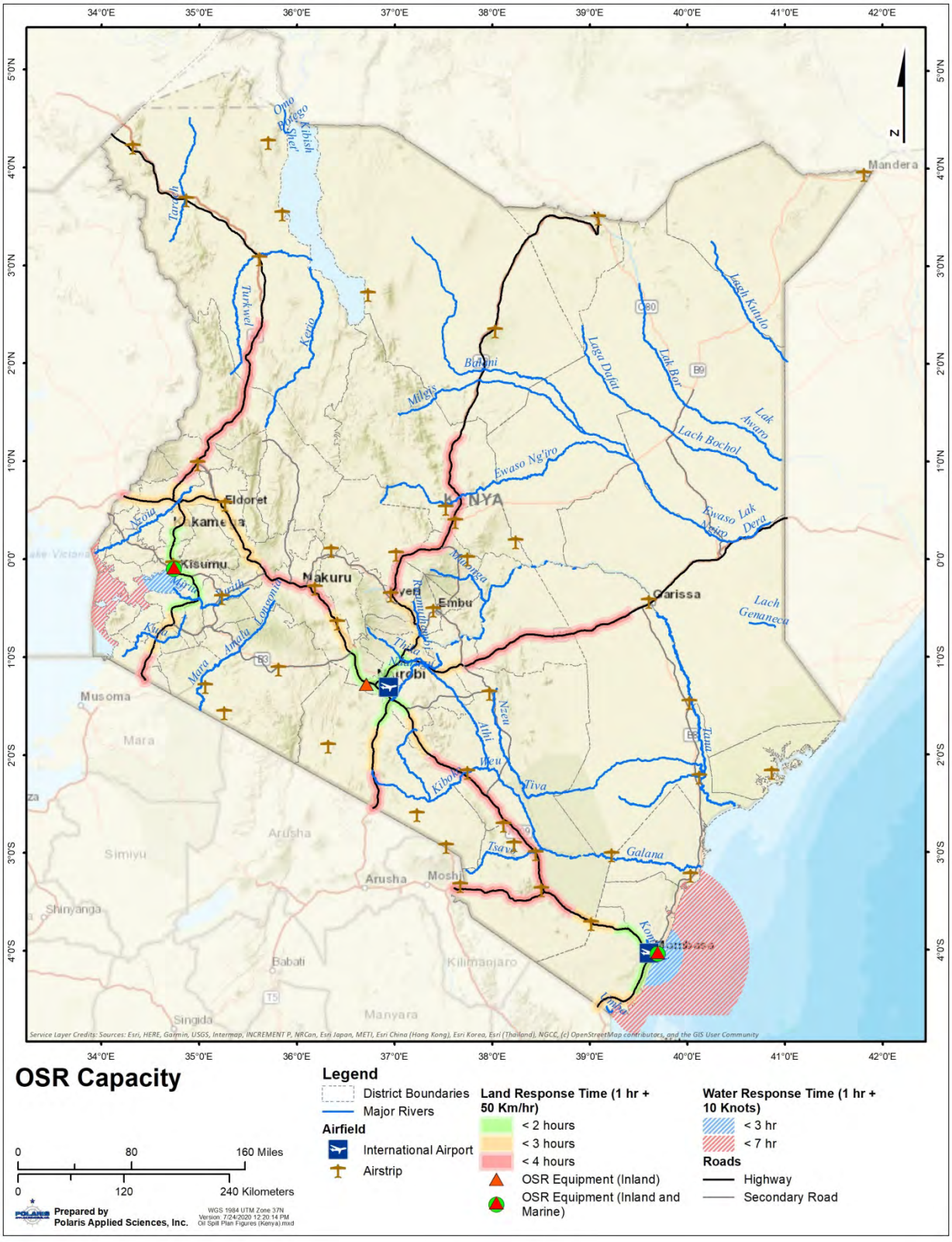

Figure 7-1 Locations of spill response equipment and approximate delivery times.

An overview of the oil spill response resources available in Kenya is provided in Table 7-1 and shown in Figure 7-1. Detailed equipment listing from inventories provided through industry are available in Appendix C.

Table 7-1 Overview of marine and navigable waters spill response resources in Kenya

Source	Location	Boom	Pumps	Skimmer	Portable Tanks	Dispersant	Sorbents	Trained responders	Vessels
KPA	Mombasa	✔	✔	✔	✔	✔	✔	✔	✔ *
OSMAG	Mombasa	✔	✔	✔	✔	✔	✔	✔	✔
KPRL	Mombasa	✔	✔	✔		✔		✔	✔
Shell	Mombasa	✔	✔	✔	✔	✔	✔	✔	✔
Chevron	Mombasa		✔	✔	✔	✔	✔	✔	✔
Kobil	Mombasa			✔				✔	
Total	Mombasa		✔			✔	✔	✔	✔
KPC	Mombasa	✔	✔	✔	✔	✔		✔	✔
KPC	Kisumu	✔	✔	✔	✔			✔	

* Two KPA oil spill response vessels: (1) Catamaran with on-board bow collector, dispersant sprayer, 200 m containment boom, 30 tph weir skimmer, and (2) Tug boat with on-board sprayer, boom, skimmer (OSMAG 2019 inventory)

Human resources are available through the OSMAG Society and trained delegates from KPA and OSMAG members; Table 7-2 (updated September, 2019).

Table 7-2 ORT and IMT Trained responders in Kenya

Type of Training	Number of trained delegates from OSMAG members and KPA
Oil spill Response Course (Theory & Practical)	290
Shoreline Clean-up Assessment Techniques (SCAT)	135
Incident Command System (ICS)	146
Table Top Exercise	65
Onshore Response Course	43

7.1 Tier 1 Resources

All oil-handling facilities are to maintain, or have available through contracted services, spill response equipment appropriate to the types of oils handled, local environmental conditions, and capable of being deployed locally within 1 hour at the facility or port to address minor spills (see Table 4-1 for example of minimum response time and Table 4-2 for general spill classification).

Minimum resources should include equipment for:

- Safety:
  - air quality monitors for at least explosion hazards (LEL), benzene, and H_2S

    - appropriate Personal Protective Equipment (PPE) (respirators, nitrile gloves, clothing and footwear protection)
- Containment:
    - sand bags, barriers, weir dams, boom, or similar
- Protection:
    - barriers (i.e., boom) to minimize oil contact with priority sensitive areas
- Oil recovery
    - sorbents, pumps, skimmers, vacuum trucks
- Waste handling
    - pools, drums, portable tanks, fixed tankage
- Clean-up and treatment
    - shovels, rakes, hoses, decontamination materials

Spill equipment is to be listed in facility or terminal oil spill response plans and the equipment lists made available to NEMA. Oil handling facilities and/or oil spill response contractors shall notify NEMA of any major spill response equipment that is placed out-of-service and the approximate date the resource is expected to be available. NEMA maintains the right to audit and inspect oil spill equipment at facilities to ensure inventories are accurate and that the equipment is properly maintained and available for immediate use.

7.2 Tier 2 Resources

Tier 2 resources are those that may be mobilized from locations within Kenya to support a Tier 1 response capability. Tier 2 resources can include government and industry dedicated oil spill response resources as well as equipment, materials, and expertise from contractors and NGOs. Tier 2 capabilities include a wider selection of equipment, more trained responders, and a greater range of specialisation.

7.3 Tier 3 Resources

Tier 3 resources include internationally-available resources (equipment and specialized personnel) that may be mobilized from neighbouring countries such as Uganda and Tanzania at Lake Victoria, as well from international spill equipment hubs. Tier 3 responders can include members of the neighbour Countries oil spill response organizations and experienced personnel from around the world.

An analysis of the tiered response resources and requirements for Kenya and this NCP is provided in Table 7-3, following the international best practice approach for tiered preparedness. Appendix D provides additional information on the cross-boundary movement of equipment and personnel.

Table 7-3 Overview of tiered response capabilities for Kenya.

Capacity	Tier 1	Tier 2	Tier 3
Source Control (emergency repairs, transfers, lightering)	Local transfers & patches; limited firefighting at sea, some oil lightering capability	Same as Tier 1. Limited available assets for Tier 2.	Required for to access major transfers, salvage operations, well control (e.g., Onshore well blowout specialist)
Surveillance, modelling and visualization	Some expertise from industry and technical expertise in country.	No dedicated resources; first observers, possible drone; Department of Resource Surveys and Remote Sensing (DRSRS) in Nairobi could be trained to provide spill surveillance and visualization support.	Required for expert tracking & modelling
Controlled In-situ burning	No capability	No capability	Required for application platforms, ignitors, and monitoring
River containment and recovery	Reasonable capacity through KPC and OSMAG	Limited available assets through cascading	Required for any major persistent oil to rivers
Shoreline assessment (SCAT)	Very limited (KMA and OSMAG)	Requires expertise	Requires expertise
Shoreline clean-up	Reasonable capacity through industry and government (e.g., KPC, KPA, OSMAG)	Generally adequate through cascading	Expertise and resources possibly for major spills into sensitive areas
Oiled wildlife response	Requires expertise	Requires expertise	Requires expertise
Waste management	Very limited for oily wastes (NEMA)	Requires expertise and temporary storage	Required for processing, recycling, and disposal
Stakeholder engagement and communication	Sufficient	Reasonable capacity through industry, government & NGOs	International assistance may augment engagement with neighbouring nations and communities
Economic assessment and compensation	Sufficient	May require assistance with assessment and cost recovery	Requires expertise for comprehensive assessment and cost recovery
Environmental impact assessment & sampling	Sufficient (NEMA, KMA, KPC)	May require assistance with assessment, SCAT, and processing samples	Requires expertise for comprehensive assessment and sampling programs
Incident Management System	Reasonable capacity through industry and government (NEMA, KPA, KPC, NDOC, KMA)	Expertise likely required for Unified Command and specific functions (developing IAP, SCAT, NEBA); may require personnel for extended time	Requires expertise and personnel for full spill management team, 24hr activities, and extended response time

7.4 Support Services and Resources

Logistical support is an integral part of a successful response operation and will be directed by the IMT Logistics Section Chief. Depending on the size and extent of a spill, logistics support may be provided on-scene from local sources or expanded to securing Tier 3 resources from worldwide locations. The primary logistical "hub" for Tier 3 response may be located in the KPA warehouse in the Mombasa Port, or at KOJ (KPC Kisumu Oil Jetty in Lake Victoria) depending on the scale and cascading IMT support required.

Logistics support will consist largely of sourcing and providing personnel, equipment, materials, and supplies needed by the ORT and IMT. As response operations are mobilized and deployed to the field, the Logistics Section will ensure that resources are dispatched to various staging sites as required.

Logistical support is facilitated by the existing support network maintained by KPA, KPC and industry (OSMAG Society) for oil spill response and by NDOC as part of the National Disaster Response Plan. This support network includes but is not limited to:

- OSMAG Executive and Working Committee
- National Humanitarian Services Committee:
  - Kenya Red Cross Society/Other NGOs
  - Ministry of Provincial Administration & I.S
  - Ministry of State for Special Programmes (MSSP)
  - Relief and Rehabilitation Department (R&RD)
- County Governments

Transportation-related services are always needed during moderate and major incidents. Major support for transportation-related services includes:

- Air support (overflights, monitoring, cargo & personnel)
- Vessel support (equipment and personnel transfers, on-water operations, monitoring)
- Earth-moving equipment (construction of barriers, soil excavation & transport, clean-up)
- Road transport (equipment and personnel transfers, support for field activities, waste movement)

In country logistical support exists, however specialized training on oil spill response is required for local organizations; e.g., air surveillance support from the Department of Resources Surveys and Remote Sensing (DRSRS), KWS, and NEMA.

Appendix C, Spill Response and Logistical Resources, provides listings of key support assets such as vessels and waste transportation services. The NEMA, DRSRS, NDOC, and KMA should be consulted for additional logistical support services and providers.

7.5 Communications

One of the first priorities during a response is to establish a communications network that will cover the necessary geographical area and provide communications between all elements in the response. Typical communication systems and their applications are summarized in Table 7-4.

Communications between ORT and IMT facilities (i.e. ICP, staging sites, and EOC) and responders will be primarily by telephone with backup provided by UHF, VHF, or SSB radio. The Communications Unit in the Logistic Section of the IMT will complete an Incident Communication Plan for any spill (see Incident Communication Plan (ICS-205), in Appendix B, Forms).

Key points in implementing a communications network include:

- Ensure sufficient communication specialists are available
- Ensure weather forecasts are accessible
- Ensure that transport assets, aircraft, supervisors, etc., can talk to each other
- Use intrinsically safe radios that will not interfere with radio control signals in hazardous atmospheres
- Strive to have individual work crews use separate frequencies
- Place UHF, VHF repeater stations as high as possible
- Make repeater visible from all points in the coverage area

Maximum range using repeater stations is about 100 km

Table 7-4 Typical communications applications

Type	Use	Range
VHF-AM Aircraft	For ground-to-air communications (use assigned channels)	Line of sight
UHF Oil Spill	Company frequencies for field coordination (Use intrinsically safe radio in hazardous locations)	Line of sight
High Frequency Radio	Single side-band for distances over 50 km (high frequency-SSB)	50 to 85 km
Cellular Telephones	Mobile communications where network is available	Within area served
Satellite Telephones	Voice, data and facsimile offshore or remote locations where approved	Worldwide
Telephone, Facsimile, and Data	Transmission systems to cover the geographical area of the spill require time to implement	Infrastructure-dependent: Data exchange and Internet; WIFI and wired

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Contents

8 Response Strategies

Spill response may include one or more of the following activities:

- Surveillance and tracking
- On-land operations
- On-water operations

In the event of an incident the primary goal of spill response is to assure that actions are efficient and compatible with the balanced environmental, social, and economic needs of the community and government requirements. Decisions on the appropriate response options to use, particularly in open water, are based on:

- an analysis of the rate and duration of the spill event,
- wind and weather conditions,
- limitations of response equipment and supplies,
- expected behaviour of the spilled oil,

- potential effects and consequences of spill intervention options,
- geographical locations, and
- nearby sensitive areas.

Mechanical containment and recovery, and in-situ burning, are the options that would be evaluated in determining the response strategy that would result in the greatest net environmental benefit. Each option has a specific function and is used for different spill situations. These options may be considered individually, or in combination with each other to yield the maximum benefit. It is important to recognize that multiple, simultaneous response options may be appropriate for a response.

8.1 Net Environmental Benefit Analysis (NEBA)

A crucial decision in spill response is to define the point at which the benefits of optional treatment or clean-up methods are outweighed by the negative effects of the options selected. The Net Environmental Benefit Analysis is a well-known process used in emergency response for selecting the most appropriate response option. An adaptation of NEBA procedure, to address trade-offs for both environmental and socio-economic considerations, is referred to as Spill Impact Mitigation Assessment (SIMA). This Onshore-NCP endorses the use of NEBA (and best practices from SIMA) as the foundation standard operating procedure to assess response options and clean-up targets for hydrocarbon releases.

The NEBA/SIMA process evaluates the advantages and disadvantages of available response options (including natural recovery) and then selects the response option that has the greatest net environmental benefit. The IMT, led by the Environmental Unit, will work to perform a NEBA/SIMA when determining the appropriate response strategies. An effective NEBA/SIMA requires:

1. Identifying and prioritizing, according to environmental sensitivity, an area's ecological, socio-economic, and cultural resources.
2. Evaluating the various response options and then comparing them not only to each other but also to the option of natural recovery. This determines the response methods that have the least impact on the environment (or net environmental benefit).
3. Select the response option or combination of options that will prevent or reduce impacts to sensitive, valuable resources.
4. Determining the potential treatment or clean-up end points for response operations.

The resources at risk from either or both the spill AND the response techniques must be considered together. For example, in the case of a spill that threatens a highly sensitive habitat or an important socio-economic area such as a National Park, a NEBA may identify natural degradation as a preferred option. In wetlands, oil spill response is typically "hands-off" in all but the heaviest of oiling conditions (e.g., pooled oil burying wetland vegetation) (NOAA/API 2013). There is abundant literature on the detrimental effects of intrusive treatment in oiled marshes and wetlands (Baca et al, 2014, Baker 1999, Challenger et al 2008, NOAA/API 2013, Pezheski et al. 2000, Rutherford and Michel 2014).

The NEBA approach accepts that some spill response and clean-up countermeasures have the potential to cause a negative impact on the environment; however, they may be justifiable because of overriding

benefits and/or the avoidance of further impact. As another example of its use, NEBA may be used to resolve the conflicting outcomes of treating an oiled wetland to protect fish or wildlife that could come into contact with the oil versus the likely adverse impacts to vegetation and recovery caused by the clean-up response. The appropriate response will be determined with a view to limiting negative environmental impact and maximizing net environmental benefit

8.2 Key Strategies and Tactics

Spill prevention is the top priority for all activities associated with oil transfers, transport, and storage. If a spill occurs, the RP (all Tiers) and NEMA (Tier 2 and 3) key response strategies and priorities are:

- safety of public and responders (Section 2.3)
- control of fire/explosion risks (Section 2.3)
- source control
- spill containment (unless unsafe)
- surveillance and tracking (Section 6.3)
- protection of sensitive resources
- removal of spilled product
- clean-up of oiled areas
- waste minimization and management, and
- rehabilitation of affected areas.

Each spill requires specific response strategies to address the unique characteristics of the event. An overview of the decision-making process to select strategies and considerations for spill response are shown in Figures 8-1 and 8-2 and listed in Table 8-1.

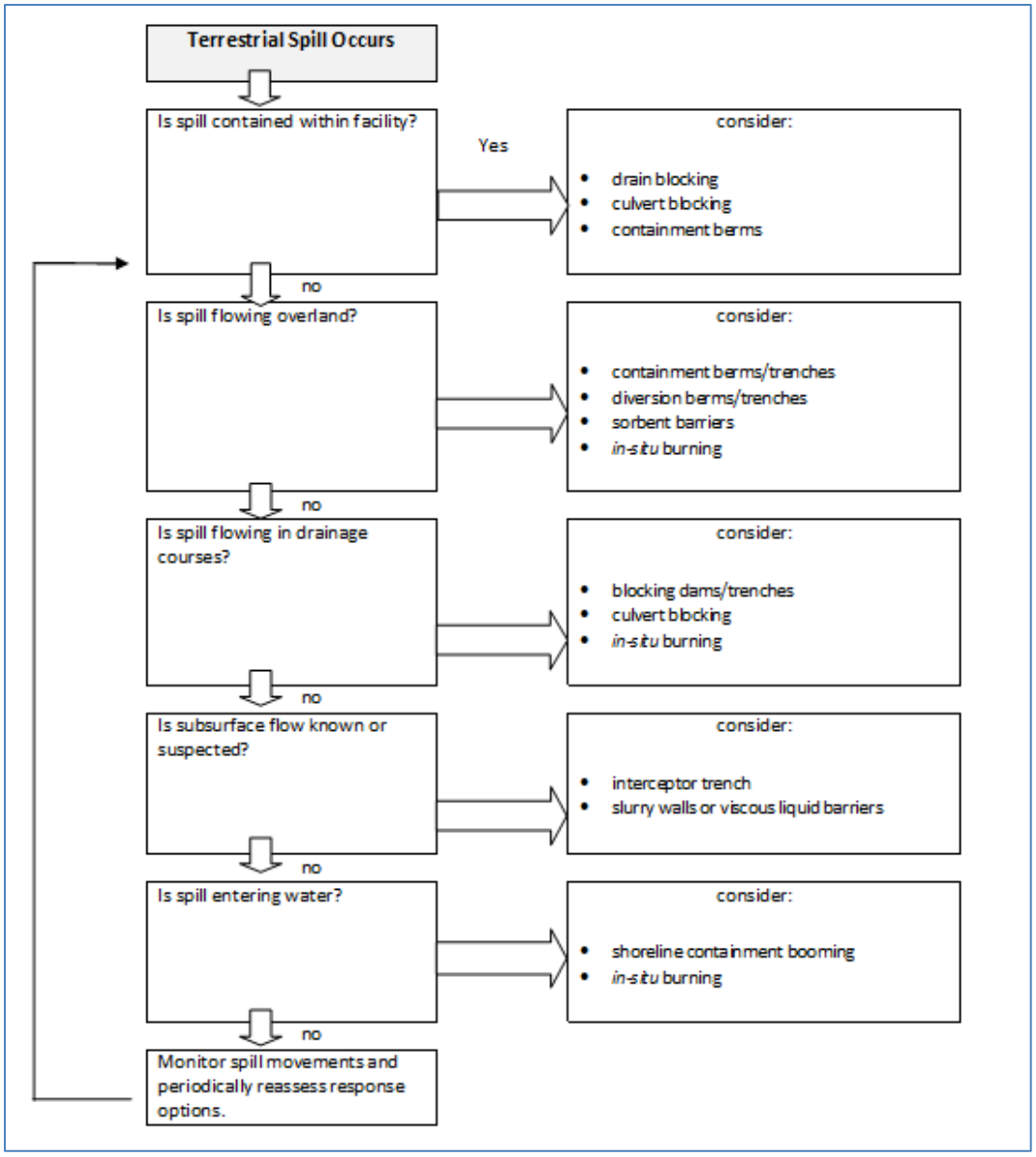

Figure 8-1 Containment strategies for spills on land

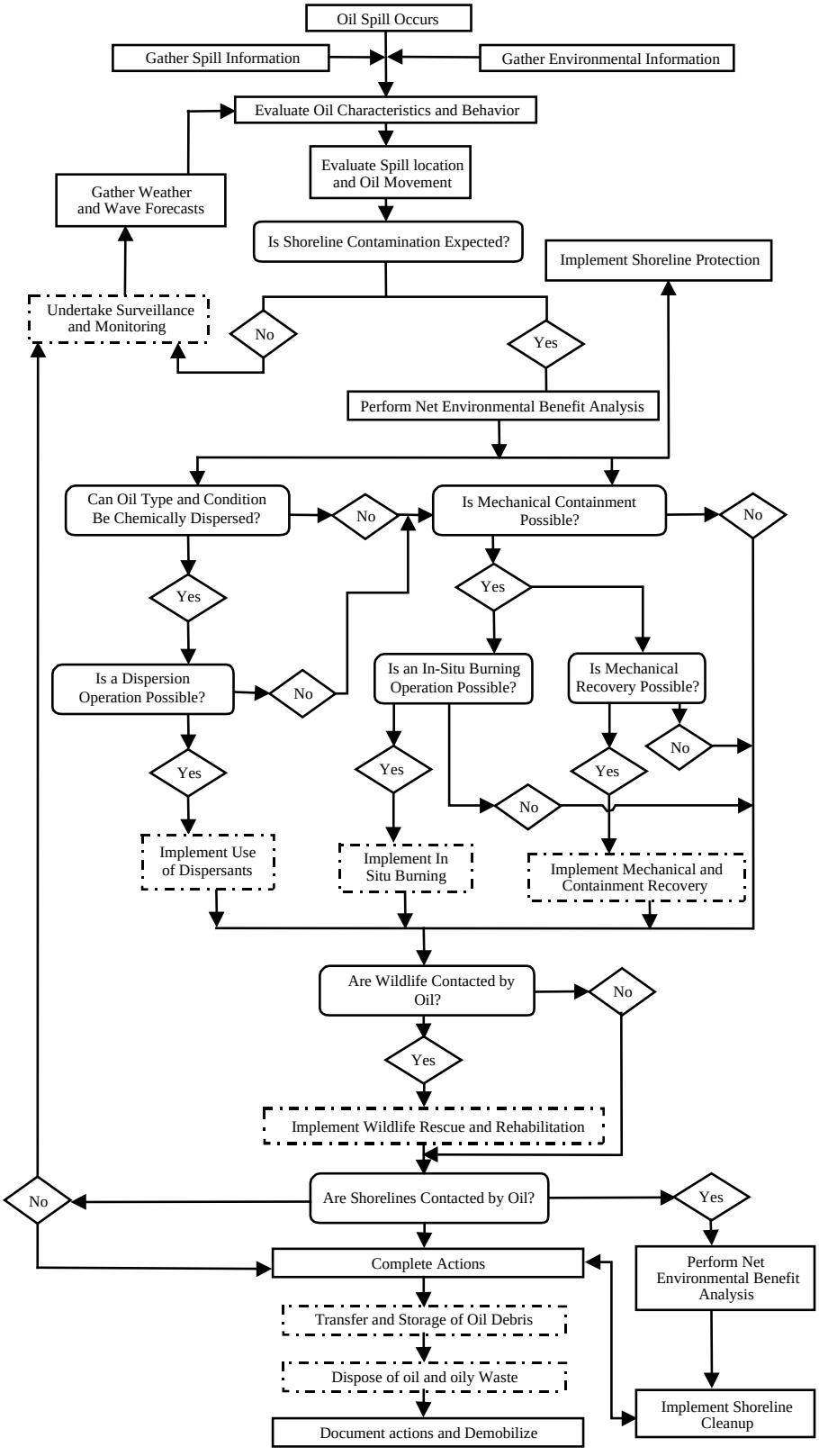

Figure 8-2 Key on-water spill response strategies

Table 8-1 Considerations and response options for developing spill response strategies

Planning & Logistics	Factors that influence the time to mobilize operations and the identification of associated response priorities
Spills on Water	Countermeasures operations for spills into water depend on weathered oil characteristics, proximity to sensitive areas, and hydrodynamic conditions. Options include booming, skimming, removal, storage, and burning. ***Dispersant application is not recommended for the freshwater environment***.
Spill Monitoring	Spill monitoring includes safety and occupational health conditions, existing and possible environmental threats, and trajectory modelling.
Removal	Techniques for skimming and collection of oil released onto land or into water.
Transfer	Equipment needed to segregate and move collected liquids and solids to interim storage and disposal facilities.
Shoreline Clean-up	Response actions required in dealing with land and river bank (shoreline) clean-up must take into account the risks from lingering oil, sensitivity or affected areas to oil, and the effects of treatment options. Methods include mechanical and manual removal, flushing, and in-situ treatment.
Control Points	Specific geographical locations, primarily along 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.

Table 8-2 Summary of Terrestrial Containment and Control Techniques

Technique	Description	Limitations	Potential Environmental Effects
Earth Containment Berm	Low barriers constructed with locally available materials (e.g., earth, gravel, sandbags, etc.) are used to contain surface oil flow.	Steep terrain Accessibility Implementation time Highly permeable soils and low-viscosity oils	Environmental damage inflicted by excavation of berm materials.
Earth Diversion Berms	Low barriers are constructed of available materials (earth, gravel, sandbags, etc.) to direct oil flows to a recovery point or around a sensitive area.	Steep or rugged terrain Accessibility Implementation time Highly permeable soils	Environmental damage inflicted by excavation of berm materials.
Trenches	Dug by machinery to contain and collect oil for recovery or to intercept surface oil flows. Used on most terrain types and redirect them to recovery points or around sensitive areas. Likely would have to be lined to prevent penetration.	Limited accessibility Implementation time Low-viscosity oils on highly permeable soils High water table	Environmental damage inflicted by trench excavation and, if not lined greater oil penetration.
Sorbent Barrier	Low elevation sorbent barriers are used on relatively flat or low-slope terrain to contain or immobilize minor oil flows and recover a portion of the oil; or to limit penetration into permeable soils.	Implementation time Steep slopes	Winds may blow sorbents into the surrounding environment
Culvert Blocking	Boards, sandbags, inflatable plugs, or earthen materials are used to block culverts as a means of containing oil flow into drainage courses that feed into culverts; may also be used to prevent oil from entering tidal channels connected to the ocean through culverts.	Limited accessibility Implementation time Storage area behind culvert Flowing water Culvert size	
Drain Blocking	Sandbags, boards, mats, or other materials are used to prevent oil spilled on roadways and paved areas from entering storm drains or pipes. For curb inlets, position a board over the curb inlet and hold it in place with a sandbag. Street inlets can be similarly blocked with a board or plastic sheeting.	Implementation time	
Soil Interceptor Trench	Trenches are constructed across the migration path to intercept the horizontal movement of spilled oil within the subsoil (i.e., floating above the water table and moving with the groundwater.	Rocky ground Water tables > 3 m below the surface Implementation time	Environmental damage inflicted by trench excavation
Slurry Walls	A vertically excavated trench is filled with slurry to contain or divert contaminated groundwater, or to provide a barrier for the groundwater treatment system.	Wall may degrade over time; specific contaminants may degrade wall components.	Environmental damage inflicted by trench excavation

8.3 Mechanical Containment and Removal

Oil spill containment and recovery is always an option to be considered. Containment and recovery equipment located on site would be used to limit the spread of the oil by deployment as close to the source as safety permits. Response time is critical for effective containment and recovery, as spilled oil tends to spread rapidly on water. If mechanical response is a tactical option, spilled oil on water should be confined as soon as possible to limit spreading and to facilitate recovery.

Caution!

- **DO NOT CONTAIN GASOLINE ON WATER** (aliases MSP, Petrol, or any other highly flammable HNS) as concentrated vapours may ignite easily and explode
- **DO** position containment barriers to keep gasoline out of environmental and socio-economic sensitive areas.

8.3.1 Containment — On Land

Spills to land can impact environment and socio-economic resources if not contained and secured properly. For example, an overturned petrol truck-tanker represents an intolerable risk of fire and explosion when approached by the general public (non-trained responders). Site security (isolating the hazard safety zones) and establishing a safe perimeter is the first and most important priority; see initial response actions in Sections 2: Site Command and Control (Section 2.3.1) and Site Safety (Section 2.3.2).

Containment of spills on land should be incorporated into the design of facilities that handle and transfer oil, including bunds, curbing, berms and controlled drainage through oil/water separators. Additional containment options include constructing temporary dams/berms, blocking drains, and creating catchments (trenches, pits) as pooling spots to collect oil.

8.3.2 Containment — On Water

Temporary underflow (weir) dams and portable boom are typically the first mechanical response tactics considered for spills in small waterways. Dams and boom are used to contain or deflect oil on the water surface for removal by skimmers or burning, and/or to protect sensitive resources and amenities. Portable dams and boom are manufactured in a wide variety of designs, sizes and materials for different applications. Temporary dams and boom can be used effectively on rivers and must be appropriate for the water depths and current speeds expected.

8.3.3 Collection with Sorbents

Minor spills may be recovered using oleophilic adsorbent booms, sweeps, sheets, pads, and pom-poms. Oleophilic sorbents collect a wide range of oil types but do not collect water. Contained spills into water can be easily collected using these materials. A variety of oil sorbent materials are stored in spill kits located in pumping units, terminals, and even in tanker trucks. Drawbacks of using large quantities of sorbents as a primary response option are the resulting waste handling and disposal issues.

Caution: Do not use particulate sorbent in uncontained river spills.

8.3.4 Mechanical Recovery

Mechanical recovery, or the physical removal of oil from the environment, is the method that is usually perceived as the least harmful to the environment. As appropriate, mechanical recovery is used in conjunction with other methods on a spill, although non-mechanical options typically are not used in the same location as mechanical recovery systems.

Numerous devices are commercially available that employ a variety of oil collection mechanisms. Vacuum trucks are effective in collecting pooled, pure product from trenches, pits, and other containment. For spills that reach water, the preferred option is to use a skimmer capable of separating and removing oil from the surface of the water and pumping it to storage for subsequent treatment and disposal. Oil spilled on water tends to spread rapidly to a thin sheen, thus reducing the potential skimmer-to-oil ratio (encounter rate). To maximize the encounter rate, weir dams or oil spill containment booms are deployed to concentrate the oil.

Skimmers can be grouped into four categories based on oil recovery principle. Each category contains various skimmer types that are distinguished by specific oil collection mechanisms (Table 8-3). Most manufacturers produce a range of skimmer models or sizes designed around a single oil collection mechanism.

Table 8-3 Main skimmer categories

Skimmer Category	Examples
Weirs	Simple, self-levelling, screw auger-assisted, stationary and advancing, and boom/weir systems
Oleophilic surface skimmers	Drums, discs, ropes, belts and brushes; deployed independently, mounted on a vessel, or used with a boom
Hydrodynamic skimmers	Water jet, submersion plane and rotating vane
Other devices	Vacuum systems, air conveyor and paddle belt

8.4 Non-Mechanical Strategies

In-situ burning, burning of oiled materials, and use of surface cleaners are strategies that may be appropriate for some spills taking into consideration the technique, timing and sensitivities, and net environmental benefit of these actions relative to other options. Each of these strategies, however, requires consideration and approval from NEMA prior to their use.

8.4.1 Chemical Dispersants

Chemical dispersants are commonly considered in marine water spills to break oil slicks into fine droplets that then disperse into the water column. This prevents oil from being driven by wind and currents toward shore and promotes its biodegradation at sea. **The use of dispersants is not recommended for spills into freshwater.**

8.4.2 Controlled In-Situ Burning

Conventional booming and skimming operations should always be conducted whenever they can be implemented safely and with a reasonable degree of effectiveness. However, there are often situations where In-situ burning (burning oil in place) may provide a means of quickly and safely eliminating large quantities of oil quickly, safely and efficiently.

Controlled in-situ burning is a viable response option if:

- appropriate equipment is kept nearby,
- circumstances allow the safe removal of oil without posing a threat to the health and safety of response personnel and the public, to facilities, or to sensitive habitats or other biological resources,
- oil thickness is sufficient to start and sustain a burn (more than 3mm), and
- oil has not emulsified.

Contained burning is subject to the same limitations as mechanical containment and recovery. The in-situ burning of spilled oil offers the following advantages:

- burning removes large quantities of oil rapidly and efficiently,
- burning can prevent or minimize the amount of oil that may be transported downstream,
- burning can often be used in situations where skimming is physically or logistically impossible, such as in wetlands and marshes provided adequate fire breaks are in place and vegetation roots are in water-saturated soils, and
- burning greatly reduces the need for storage and disposal facilities near the spill area.

The NEMA, in consultation with the Fire Department, and county government is responsible for the approval of in-situ burning of spilt oil in Kenya. For in-situ burning to be safe and effective, it must occur on relatively 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 5 km upwind from any populated locations.

8.5 Clean-up and Treatment

The need for clean-up (what to clean?) and the degree of clean-up to be achieved (how clean is clean?) are two important decisions that the IMT will have to make. Decisions will depend on the areas to be cleaned and its vulnerability to treatment, as well as the presence of sensitive areas. Particular consideration should also be given to security aspects.

The first phase of the clean-up operation should focus on removing the bulk accumulations, i.e. thick layers of oil covering an area, the shoreline, and/or oil floating at the edge of the water. This may be achieved through a combination of:

- manual collection,
- use of earth-moving equipment (e.g. front-end loaders), where access is possible for this type of equipment,

- pumping using pumps and/or skimmers, and
- controlled burns.

Clean-up operations are labour intensive. In most cases, manual collection of the oil remains the best option. Use of mechanical equipment increases the collection rate of oily wastes; however, their use is conditioned by the presence of suitable access roads to the area and the bearing capacity of the land. The use of heavy earthmoving equipment produces high volume of oily wastes, which need to be stored, transported and disposed of.

Clean-up operations can result in more damage than the oil itself and net environmental benefit trade-offs must be considered for each of the appropriate treatment options and clean-up end points. The Shoreline Clean-up Assessment Technique (SCAT) team typically will survey and recommend treatment actions taking into consideration degree of oiling, type of substrate, resources at risk, potential for oil remobilization, and feasibility of treatment options.

8.5.1 General guidelines for selecting response techniques by habitat

Selecting the right combination of response techniques includes analysing the effectiveness of the response options for the specific type of oil and the environmental sensitivity. There are intrinsic potential impacts that each technique presents to different types of habitat. Table 8-4 classifies the potential impact that each response techniques represents in the receiving environment based on three estimated recovery periods (without considering oil toxicity effects):

- Least Impact: days to weeks
- Some Impact: weeks to months
- Greatest Impact: months to years

Techniques that show a greater impact should be avoided (e.g., high pressure and hot water flushing for all habitats except impermeable substrate).

Table 8-4 Relative Impact of Response Techniques by Habitat. Source: API Technical Report 425

Green = Least Impact; Yellow = Some Impact; Red = Greatest Impact. - = Not Applicable for That Habitat

Response Technique	Water Habitats				Land Habitats						
	Lake	Pond	Large River	Stream	Developed Land	Forested Upland	Forested Wetland	Grassland/ Cropland	Grassy Wetland	Permeable Substrate	Impermeable Substrate
Natural Attenuation											
Containment/Recovery											
Booming					-	-	-	-		-	-
Skimming					-	-	-	-		-	-
Barriers											
Trenching	-	-	-								-
Removal											
Manual Removal											
Vacuum/Pumping											
Sorbents											
Excavation											-
Dredging					-	-		-		-	-
Debris Removal											
Washing/Recovery											
Flooding	-										
Low Pressure/Ambient Water Flushing	-	-	-								
High Pressure/Hot Water Flushing	-	-	-		-						
In Situ Treatment											
Sediment Reworking/Mixing On Land	-	-	-	-							-
Sediment Agitation in Water					-	-		-		-	-
Vegetation Removal	-		-							-	
In Situ Burning											
Biological Treatment											
Nutrient Addition	-		-	-							-
Microbe Seeding	-	-	-	-							-
Phytoremediation	-	-	-	-							-
Chemical Treatment											
Solidifier					-	-	-	-		-	
Surface Washing Agent	-	-	-	-	-	-	-	-		-	
Herding Agent					-	-	-	-	-	-	-
Dry Ice Blasting	-	-	-	-	-	-	-	-	-	-	

8.5.2 Clean-up end points or treatment completion criteria

Clean-up activities that follow a spill can cause adverse environmental and socio-economic impacts if not carried out properly. Defining termination procedures is a critical part of the clean-up process to prevent spill response activities from becoming part of the problem instead of a solution.

During any potential oil spill event, the Environmental Unit Leader (EUL) must work with the Unified Command to define "how clean is clean" or the oil spill response termination criteria. NEMA is the EUL and must coordinate with the Responsible Party and key technical members of the Environmental Unit to establish treatment completion (clean-up target criteria or no further treatment guidance) for distinct habitats.

Defining the appropriate treatment targets or completion criteria for spill response requires understanding the site-specific natural recovery capability, which depends on weathering of the spilled oil, environmental conditions, and microbial degradation. The environmental and socio-economic effects of clean-up activities, including real damage to flora and fauna and the potential decrease of local community business opportunities from perceived spill damage, should also be considered in selecting clean-up treatment completion criteria (see Section 8.2 – Net Environmental Benefit Analysis).

8.6 Wildlife Response

Oiled wildlife response is the combination of activities that aim to minimize the impacts of an oil spill on wildlife by prevention of oiling, where possible, and mitigating the effects on animals when oiling has taken place. The scale of impacts to wildlife does not necessarily correlate to the amount of oil spilled. Wildlife impacts can have significant legal, economic, cultural, political and/or public perception consequences for industry and the Kenya government.

To alert KWS and to initiate wildlife rescue contact the
Kenya Wildlife Services at:
+254 (20) 2379407
+254 (20) 2379408
+254 (20) 2379409

Wildlife rescue and response will be coordinated by the Wildlife Branch in the IMT, led by the KWS and Fisheries Department, working in the Operations Section and providing support to the Planning Section through the Environmental Unit (see Figure 5-2). Complex response incidents may require a robust Wildlife Branch structure to address key response functions, including but not limited to:

- Reconnaissance: data management, communications hotline
- Hazing and pre-emptive capture
- Care and processing oiled animals
- Field stabilization
- Recovery

At the time of a spill, the IMT should adapt an existing plan, or develop an incident-specific Oiled Wildlife Response Plan, aligned with the Kenya National Oiled Wildlife Response and Planning Guidelines, to provide guidance for the different phases of the response. The Oiled Wildlife Response Plan should identify objectives, strategies, tactical guidance, and information including:

- Impact Assessment (determine potential impacts to wildlife)
- Deterrence (prevent wildlife resources from getting oiled)
- Search and Capture (recover live and dead wildlife)
- Field Stabilization (medically stabilize for transport)
- Wildlife Treatment, Rehabilitation, and Release (wildlife care facility).

All oiled wildlife response will be under the control of KWS and Fisheries Service. Industry and NGO's may only intervene with the express permission of the relevant governmental department concerned. This permission must be sought, granted, and logged before actual intervention can take place.

International resources for oiled wildlife care are listed in Appendix A of this Onshore-NCP and in the Kenya National Oiled Wildlife Response and Preparedness Guidance Manual.

8.7 Decontamination

Decontamination operations are associated with the three safety zones (Section 2.3.2) at the spill clean-up site:

- Clean zone (Cold Zone),
- Contamination reduction zone (Warm Zone), and
- Contaminated Zone (Hot Zone).

Signs, barrier tape, and/or other means should be used to clearly mark these safety zones in each work area (Section 2.3).

Decontamination is carried out in the Contamination Reduction Zone by trained decontamination crews wearing appropriate protective clothing. All decontamination workers leaving the hot (oiled) zone should be decontaminated as if he/she were exposed and contaminated. This procedure is required to protect from contaminants that cannot always be seen, and from contaminants that may be located on the surface or inside of Personal Protective Equipment (PPE).

Equipment decontamination is also necessary to prevent hazardous materials from spreading out of the incident scene and potentially affecting adjacent communities or areas. All oiled equipment should undergo a bulk oil decontamination prior to transport to a designated final equipment decontamination area. All decontamination areas must have an impervious surface and runoff controls in place to prevent secondary contamination.

Contents

9 Waste Management

This section contains guidelines for managing the waste generated during an oil spill response operation. In this document, "waste" refers to materials that are generated as a direct result (e.g., recovered oil) and/or indirect result (e.g., refuse and sewage) of an oil spill. The term is not used to define these materials for purposes of treaties, laws, decrees, statutes or regulations.

Waste management programs implemented for an oil spill response will be based on the following principles:

- Provide safe working conditions and all necessary PPE
- Comply with all applicable laws and regulations (Table 9-1)
- Minimize the risks of pollution in all operations
- Cooperate with all local community and government agencies to limit impacts on local waste disposal facilities
- Handle, store, and transport oily waste in appropriate containers, tanks, and trucks
- Control the amount of waste generated by implementing waste reduction principles
- Segregate oily and non-oily waste to allow optimum reclamation and disposal
- Reuse or recycle waste materials to the extent possible
- Dispose of all waste in a safe manner and at approved disposal sites

To the maximum extent feasible, the following guidelines for waste minimization should implemented to reduce the amount of waste generated during response and clean-up:

- Remove materials and debris from areas prior to oil impact
- Reduce waste generated during clean-up through the conservative use and reuse of oiled equipment

- Discourage the unnecessary use or overuse of disposable equipment, sorbents, and clean-up products to the extent safely feasible
- Consider oil recovery systems that minimize water uptake and clean-up techniques that minimize removal of solids
- Consider decanting oily water, once allowed to separate from bulk oil, back into containment where oil recovery operations are ongoing

In-situ treatment and natural recovery of oiled areas generate the least amount of waste during a response. In-situ treatment is performed on-site to accelerate the natural recovery of the area without a requirement for off-site waste disposal. In-situ treatment includes:

- controlled burning,
- clean-up techniques that promote natural oil weathering and breakdown, and
- natural attenuation and recovery, with appropriate monitoring.

9.1 Regulatory Framework

Regulations governing the storage, transportation, treatment, and disposal of hazardous waste in Kenya are summarized in Table 9-1.

Table 9-1 Waste management regulations applicable to oil spill response.

Reference	Applicable regulation
Waste Management Regulations, 2006	• Third Schedule - Standard for Treatment and Disposal of Wastes Regulations 26, 47 • Fourth Schedule - Wastes Considered Hazardous (including waste oils/water, hydrocarbons/water mixtures, emulsions) Regulation 22 • Fifth Schedule - List of Hazardous Characteristics Regulation 22 • Sixth Schedule - Application for Transboundary Movement of Waste Regulations 27, 30 • Sixth Schedule - Permit to Export/Transit Waste Regulations 27 • Eighth Schedule - Symbols Regulation 39
The Safe Disposal of Hazardous Wastes, the Special Needs of Developing Countries, Vol. 1, 1989	A joint study of the United Nations Environment Programme (UNEP), World Health Organisation (WHO), and the World Bank, 1989, (based on requirements of the Basel Convention.)

The Waste Handling Group (within the Operations Section) and the Environmental Unit (within Planning) are responsible for ensuring that waste management procedures adhere to regulatory requirements during a response.

9.2 Waste Designations

Liquid wastes, including both oily and non-oily liquids, and solid wastes, including both oily and non-oily solid wastes, may potentially result from an oil spill. The different types of waste are generated by different clean-up methods include:

1. Oily liquid waste:
   - Recovered or skimmed oily mixtures
   - Used engine oils and hydraulic fluids
   - Fuels that are contaminated with water and/or solids
   - Contaminated rainwater runoff from waste storage areas
   - Wash waters from cleaning boats, boom, and equipment
   - Wash waters from decontamination procedures
   - Other oily waters
   - Wastes from a wildlife rehabilitation centre
2. Non-oily liquid waste:
   - Sewage and liquid human waste (grey and black waters)
   - Lab wastes
3. Oily solid waste:
   - Sand/gravel/tar balls
   - Asphalt patches
   - Sludge
   - Sorbent pads/boom/rags/wood
   - Oiled debris
   - Oily personnel gear and clothing
   - Damaged response equipment and gear
   - Empty drums and other containers
   - Contaminated soil
   - Wastes from a wildlife rehabilitation centre
4. Non-oily solid waste:
   - Domestic trash and garbage
   - Wastes from a wildlife rehabilitation centre
   - Discarded equipment and construction materials
5. Special waste:
   - Solvents and chemicals
   - Batteries
   - Wildlife carcasses
   - Antifreeze

9.3 Waste Handling

If oily waste material is produced as a result of a spill incident, the responsible party has a duty to ensure that the waste is handled, transported, and ultimately disposed of in an appropriate manner according to NEMA regulations. In the event of a Tier 2 or 3 spill response, the disposal route of recovered oil will be documented in a waste management plan approved by the Incident Commander (or Unified Command) in consultation with the spill Waste Handling Group and the Environmental Unit of the IMT. All contractors that handle waste must have the relevant waste transportation and disposal licenses.

To document the amount and disposal route of waste generated during a spill response, the following principals will be implemented.

- Label all waste containers and identify the source of the waste.
- Clearly identify containers of special wastes — Label the contents of containers holding wastes (e.g., reactive, corrosive, flammable, radioactive, etc.). This will communicate to others any potential hazards and help ensure that only appropriate wastes are deposited in them. Use only dedicated containers for hazardous waste and medical waste.
- Inventory the type and quantity of all wastes generated from a clean-up operation.
- Document quantities of restricted or hazardous waste using a waste manifest. Waste tracking can be essential in helping to manage environmental issues and costs.
- Document the transport, storage and final disposal of all wastes generated.

9.3.1 Segregation

In the event of an oil spill, all waste materials would have to be transferred under the most environmentally sound circumstance to prevent any further pollution. Optimal disposal methods vary depending on the types of waste generated (Figure 9-1). Therefore, it is important to:

- Segregate waste by type
- Minimize the quantity of each type of waste
- Avoid mixing hazardous and non-hazardous wastes together
- Label all waste containers and identify the source
- Combine wastes with similar disposal options
- Segregate dissimilar wastes with preferred disposal options

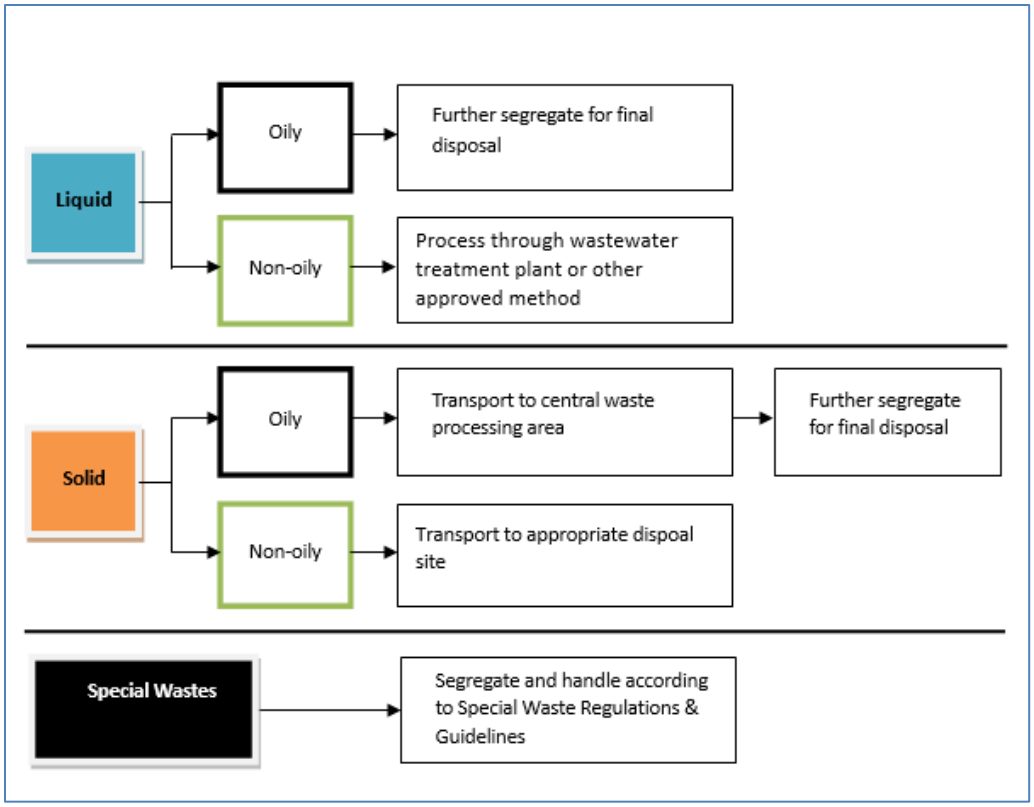

Figure 9-1 Waste sorting guide for spill response

9.3.2 Transport

Transportation options will be selected based on the type and quantity of waste to be moved. If possible, dedicated trucks will be used to transport oily and non-oily wastes. Waste transportation options include:

- tank trucks,
- freight trucks,
- light trucks,
- aircraft (helicopters), and
- dump trucks.

Solid waste will be transported as needed by trucks to the storage location. Before loading bags of oily solid waste, an impermeable liner and/or absorbent material and absorbent boom should be laid down in the cargo area. If the carrier collects bags of both oily and non-oily waste, the bags should remain segregated to avoid contamination of non-oiled bags.

If the waste is initially transported by small boat, the bags of solid waste could be unloaded at dockside facilities into lined dump or freight trucks and transported to a temporary waste storage facility or final disposal site. The liquid oil wastes collected during recovery operations could be transferred to a temporary waste storage facility for longer-term storage via tank trucks, or offloaded directly to a

reception facility. Transportation of waste to a temporary storage facility (e.g., the refinery facilities in Mombasa), must be approved by the facility management in advance (e.g., KPRL).

9.3.3 Tracking

Appropriate Waste Tracking Manifests shall accompany all wastes, hazardous and non-hazardous, when moved from one location to another. Examples of waste manifest and tracking forms are provided in the Appendix B: Waste Tracking.

9.4 Re-Use, Treatment, and Disposal Strategies

After initial collection, packaging, and temporary (interim) storage of oiled wastes, final disposal and treatment options will be evaluated. Techniques available for disposal include:

- reprocessing/recycling,
- landfarming/bioremediation,
- open pit burning, and
- incineration.

Disposal options will be selected based on whether the waste is solid or liquid and whether it is oily or non-oily (Table 9-2). To the extent practical, waste generated during oil spill clean-up activities should be recycled or disposed of at existing disposal facilities in region that routinely handle similar materials during non-spill conditions2) These facilities might include oil tankage, incinerators, produced water treatment plants, wastewater treatment plants, refineries, and landfills.

Kenya currently does not have any facilities in country that are dedicated to the recycling of oily waste that would be derived from a spill. Low cost but effective treatment systems options include:

- asphalt pavement,
- incinerators-furnaces,
- landfarming, and
- quicklime.

Table 9-2 Potential waste disposal, recycling, or reuse sites.

Operator*	Location	Type	Temporary Storage (m^3)	Disposal Method(s)
TO BE IDENTIFIED by NEMA, OSMAG, or KPC				
Options		General Waste		Incinerator
		Waste Oil	Drums, tanks, lined pits	Reprocess through refinery
		Oily Sludge	Containers or any engineered-impervious pit (such as pits lined with geomembrane) capable of holding the sludge	Landfarming or controlled bioremediation for separation of oil fraction
		Oily Sand	Mud containers or any engineered –impervious pit (such as pits lined with geomembrane) capable of holding oily sand	Transfer to a licensed waste management treatment facility or asphalt production

- *Telephone contacts for operators will be included in Appendix A – Contacts.*

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Contents

10 Demobilization and Response Termination

The Incident Management Team (IMT) is responsible for ensuring the response remains appropriate in scale. As the response needs change or as objectives are met, resources can be demobilized from the response. The IMT organization also may be reduced as the response requirements diminish. Establishing procedures for executing an orderly, well-documented process of demobilization is a major function of the Planning Section.

Terminating an emergency response involves the decision-making process for the IC or UC and associated procedures to:

- undertake monitoring and restoration activities after completion of response operations,
- ensure financial matters are handled for payments and claims, and
- debrief for key personnel regarding the response and lessons-learned.

10.1 Demobilization

Demobilization is one of several activities included in long term planning that requires constant monitoring of on-going operations, resource needs, and forecasted endpoints. A large incident may require the Planning Section (or a specific Demobilization Unit Leader) to coordinate the development of a demobilization plan. Key aspects of proper demobilization include:

- receipt of all response-related documentation including photos (electronic and hard copy items),
- return of all response equipment (includes PPE that is not surplused), and
- debriefings with key supervisory personnel (to be determined by the IC or Unified Command).

Demobilization activities may start as early as in the first day of a response. Personnel and equipment needs for spill response must be evaluated daily by each IMT Section, and primarily the Planning Section, to identify what is required and what is no longer needed. Once spill response resources are not needed, they should be placed out-of-service, inspected, and demobilized. The IMT Finance Section must receive notice of personnel and equipment deactivation.

10.2 Termination

The NEMA Incident Commander, with the consent of the NEMA Director General, (or all Unified Command representatives with the consent of their DG), can terminate the oil spill response. Before seeking the termination of the response, the IC/UC will hold a meeting of all Command and General Staff to determine whether the response strategic objectives have been achieved and the incident response has been adequately completed. A response is usually considered for termination when:

- response objectives are met ,
- clean-up treatment completion criteria are met,
- there is no net environmental benefit to continued response efforts, or
- longer term restoration will be required to achieve endpoint criteria.

Response termination involves:

- recovery, cleaning, and maintenance of all equipment used during the clean-up ,
- demobilisation of all personnel involved in the response, and
- collation and completion of all documentation associated with the spill response, including expenditure reports.

10.3 Restoration

Once clean-up operations are completed, it may be necessary to restore affected areas. The degree of restoration will be determined by NEMA, in coordination with KWS and other stakeholders as appropriate, using local or internationally accepted standards. This collaborative approach will facilitate cost reimbursements from the RP. Consideration can and should be given to offsetting restoration targets (e.g. replacing oiled soils that were removed, replanting vegetation and/or marsh, and restocking aqua-cultural projects) to maximize response benefits for recovery.

10.4 Post-Spill Assessment and Monitoring

For spills incidents that are expected to have a significant impact on resources, a post-spill monitoring program should be considered to gauge how well, quickly, and completely resources recover. Examples include Incidents that impact protected or conservation areas, endangered or protected species and

habitats, commercial fisheries, and/or human health and use. Critical aspects for post-spill assessment include:

- have or establish early in the response a baseline for comparison,
- define areas, species, and systems for monitoring and study protocols,
- establish monitoring program and frequency of observations, samples, and data collection, and
- define criteria for completion of post-spill assessments.

Once the IMT Environmental Unit determines that a spill incident is likely to require post-spill assessment and monitoring, arrangements should be made to begin to monitor and assess the long-term, as well as the short- and medium-term, impacts. The IMT Environmental Unit may establish a Monitoring Working Group to determine the scope and objectives of a post-incident monitoring, and design the monitoring program (e.g. survey design, sampling chemical analysis, collection and monitoring of affected wildlife, as appropriate to each case).

10.5 Cost Recovery

Oil spill response will entail personnel and equipment costs for responders, logistical support, and incident management. In addition, impacts or injuries to public, private, and industrial resources may result from a spill and the ensuing response actions. Early attention to information gathering and documentation are essential to assure that investigations and claim procedures are implemented effectively.

10.5.1 Compensation

In the event that the responsible party or polluter is unable or unwilling to carry out an appropriate response, NEMA on behalf of the Government of Kenya will carry them out at the polluter's expense and seek compensation per the Environmental Management and Co-ordination Act. In cases where the costs of clean-up exceed the limited liability of the RP, Kenya may make a claim to the National Emergency Compensation Fund.

In order that financial claims may be processed with minimum delay, it is essential that accurate records are maintained for each clean-up location and include details of all actions taken; the reason for such action; personnel and equipment deployed; and consumable materials used. The NEMA Finance department, through the IMT Finance Section Chief, and the Incident Commander (or Unified Command) are responsible for ensuring that these very important records are maintained and to negotiate with the RP compensation options.

10.5.2 Claims against the Responsible Party (RP)

Generally, claims for all costs and damages resulting from an oil pollution incident must be presented first to the responsible party or its guarantor (Figure 10-1). The guarantor is typically the responsible party's insurer.

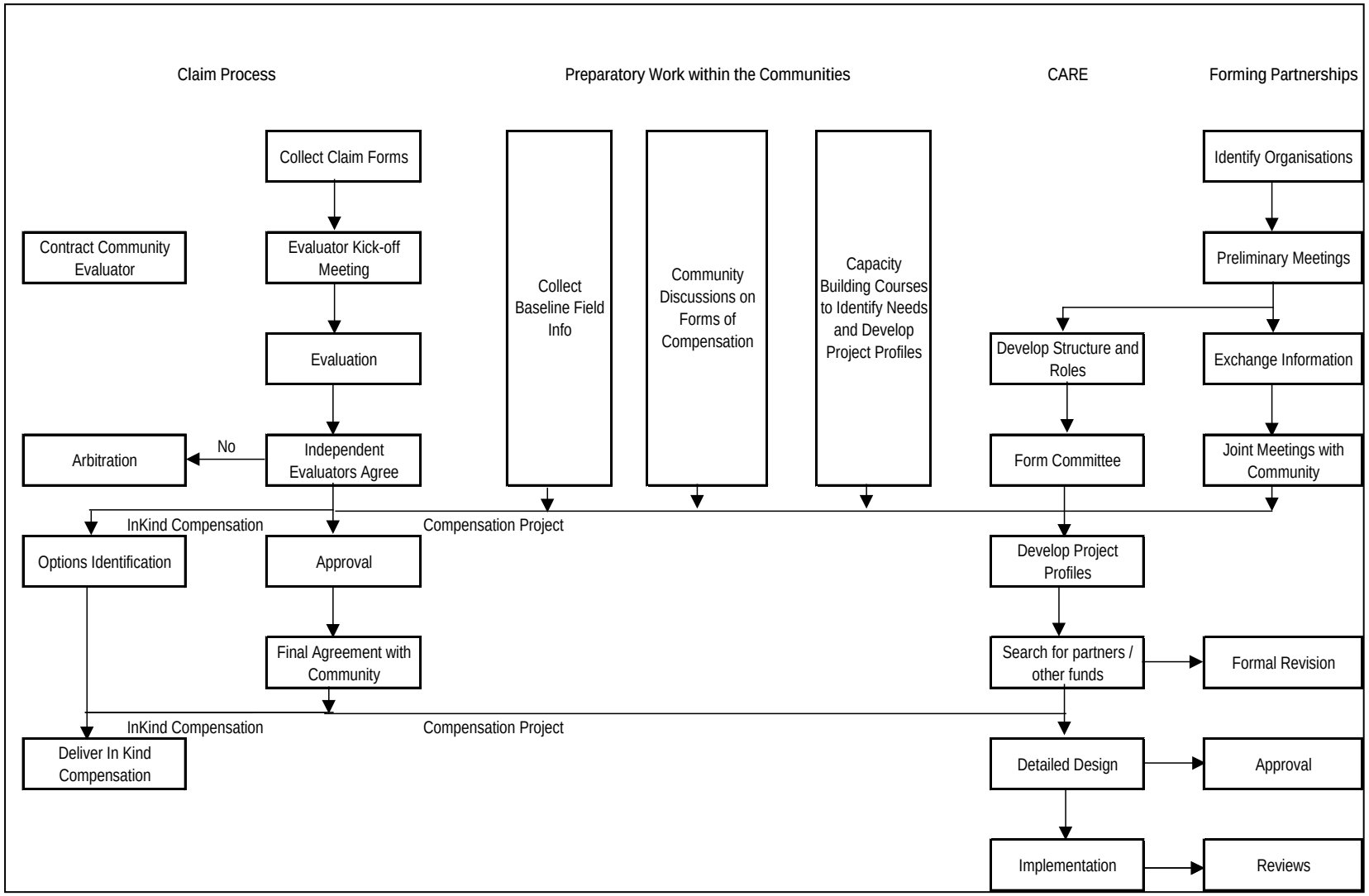

Figure 10-1 Example of claims and compensation processes

10.5.3 Reimbursement Procedures

Reimbursement of agency expenditures will be in accordance with procedures specified in written agreement between NEMA and any other agencies or response organization (e.g., KPA, KMA, OSMAG) under which goods or services are provided on a reimbursable basis; examples includes but not limited to contracts, Inter-Agency Agreements (IAG), or Mutual Aid or Cooperative Agreements. County governments may request reimbursement of costs to carry out temporary measures without a contract or cooperative agreement.

10.5.4 Documentation

The Finance Section Chief must provide for the documentation of all incident costs, and provide guidance to the IC (or UC) on financial issues that may have an impact on incident operations. These responsibilities include:

- future payments,
- future budgeting,
- payment of personnel costs,
- cost recovery,
- timely administration of contracts,
- meet with assisting and cooperating company/agency representatives, as required,
- maintain daily contact with company/ agency(s) administrative headquarters on finance matters,
- ensure that all personnel time records are transmitted to home company/agency according to policy, and
- ensure that all obligation documents initiated at the incident are properly prepared and completed

The Finance Section Chief is responsible for all finance functions needed for an incident. This individual should establish functional Units when needed to maintain an acceptable workload and span of control. Subordinate Finance functions may be combined when workload permits.

10.5.5 Required Record Keeping

A designated Time Unit Leader (Finance Section) is responsible for overseeing the recording of time for all personnel and equipment assigned to an incident. Information tracking requires daily records of personnel and equipment time reports; cost effectiveness analysis; records of all charges or credits for fuel, parts, services and commissary; verify all time data and deductions with owner/operator of equipment; complete all forms according to parent organization specifications; close out forms prior to demobilization; distribute copies per parent organization and incident policy.

The Finance Section shall maintain records of expenditures of fund moneys including:

- daily expenditures for each individual worker (name, title, activity performed, time on task, rate, travel costs, per diem, out-of-pocket or extraordinary expenses), equipment purchased or rented each day, with the daily or hourly rate,
- miscellaneous materials and expendables purchased each day, and
- daily contractor or consultant fees, including costs for personnel and contractor-owned or rented equipment, as well as that of any subcontractor.

The IMT Finance Section, in coordination with NEMA, shall submit a copy of these records and a summary document, stating the total of all expenditures made, to the National Emergency Compensation Fund within 30 days after completion of the removal actions. A copy of these documents shall also be submitted to the Incident Commander or Unified Command (IC/UC).

10.6 Debrief

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 IC/UC not later than three days following closing of the response. The IC/UC and NEMA shall be jointly responsible for submission of the comprehensive After-Action-Report, incorporating reports from all responsible agencies within 14 days of closing the particular response. Subsequently, NEMA will submit the final report to the NEMA Board of Directors for their approval.

Contents

11 Training and Exercises

The objective of the training and exercise program is to ensure that the all designated response personnel are able to respond to a spill in a quick and competent manner. The training, drills, and exercises recommended in this section enable response personnel to be familiar with their duties and responsibilities in the event of a spill.

11.1 Training

Training is to be provided for all personnel designated to participate in Tier 1 to Tier 3 response, based on their level of possible intervention in a spill and their responsibilities for response. Training requirements pertain to government, industry, and on-government personnel with defined roles in spill response activities. Response personnel named in emergency response plans will be trained on the implementation of the plans themselves. In addition to the experience and the job training, personnel in supervisory and key advisor positions will attend formal training courses relevant to their positions.

Key elements of basic spill response training include:

- Health and Safety Training,
- Response Plan Familiarization and Strategies, and
- Spill Equipment Use and Maintenance.

11.1.1 Health and Safety Training

The objective of the Health and Safety Training Program is to enable managers and workers to understand the health and safety concerns associated with oil spill response and clean-up operations. The training enables workers to protect themselves and their fellow workers from any hazard and to

perform their work in a safe and healthy manner. Personnel are designated "competent" once they have been trained in health and safety factors associated with spill response.

Safety training for oil spill response operations includes:

- health hazards associated with response and clean-up activities,
- personal protection, and
- decontamination.

Annual refresher training provides updates to safety and health issues, and re-emphasizes key components of the initial training program.

11.1.2 Response Plan Familiarization and Strategies

Plan Familiarization training must be offered to personnel who have any responsibility for spill prevention and response. An initial training session provides a detailed review of this Onshore-NCP. After having received the initial Rollout Course, management and response personnel should receive annual refresher training in Plan Familiarization that is incorporated into their annual Health and Safety refresher course.

Typical subjects covered in the annual Plan Familiarization refresher course are:

- Plan organization
- Emergency notifications
- Immediate spill response procedures and activities
- IMT responsibilities
- Incident management and decision-making
- Response resources
- Scenarios and strategies
- Training and exercise requirements
- Plan review and maintenance
- Roles and responsibility checklists
- Spill response forms and documentation
- Preparation and review of Individual Action Plans

11.1.3 Spill Equipment Use Training

All personnel who have responsibilities for operational aspects of a response must receive initial training on the use, maintenance, and repair of the spill response equipment in their inventory. Personnel should also undergo refresher training; however, the use of equipment as part of the regular exercise schedule (outlined below in Section 11.3) is expected to keep these personnel proficient with the use of equipment. Equipment requiring training includes, but is not limited to:

- Pumps and skimmers
- Boom deployment, connectors and anchoring
- Weir dam site selection and construction

- In-situ burning tactics
- Small boat engines and handling
- Radios and base stations
- Generators, compressors, and power packs

11.2 Exercises and Drills

Periodic drills and exercises will be conducted to ensure that response personnel retain familiarity with procedures and experience. Regular exercises enable response personnel to practice response techniques and procedures, to test and utilize equipment, and to review the functionality of this Onshore-NCP. In addition, the drills ensure that personnel are familiar with the most current response procedures. The drills and exercises are designed to enable response personnel to practice, test, and demonstrate their capabilities to perform assigned responsibilities in the event of a spill. NEMA may invite selected contractor personnel, other local responders, or representatives from county and national jurisdictions to participate in spill response drills and exercises.

The exercises in Table 11-1 are recommended for operational spill preparedness.

Table 11-1 Spill Drills and Exercises

Exercise/Drill	Frequency	Participants
Notifications and Call-outs	Quarterly	Facility Management National IMT
Equipment Deployment Drills	Annually*	Facility Tier 1 Designated National IMT Personnel
Spill Management Team Tabletop Exercise	Annually*	Facility Tier 1 Team National IMT
Worst-Case Tabletop Exercise and Equipment Deployment Drill	Triennially (3 years)*	Designated Facility ORT Personnel National IMT Designated Tier 2 and 3 Resources (Mutual Aid)

**Actual spill response that entails a comparable level of response may be substituted for these exercises.*

11.2.1 Notification exercises

Notification exercises are to be conducted quarterly to test and verify contacts listed in this Onshore-NCP. Companies with Oil Spill Response Plans similarly are required to conduct quarterly notifications. These quarterly exercises generally are limited to the notifications required of a Tier 1 response; however, once a year, the notification exercise should encompass Tier 2 and 3 personnel.

At least one quarterly notification exercise per year should be conducted outside normal business hours and at least one exercise should include external Mutual Aid. As appropriate, notification exercises involving external government contacts may be extended to include government-to-government contacts with neighbouring countries.

11.2.2 Spill Management Tabletop Exercises

Annual - Spill management tabletop exercises must be completed annually for government agencies with defined roles in the National IMT. Similarly, each company engaged in oil exploration and production, or in bulk hydrocarbons storage and transport (rail, road, or pipeline) is required to complete a spill management team tabletop exercise annually.

Triennial - Every three years, NEMA shall select a scenario that is used to test equipment deployment and incident management objectives. Optimally, these scenarios represent the "worst-case event" spill conditions as identified in this Onshore-NCP or in a select company's OSRPs. These exercises may include local industry, government agency representatives, local technical support, and possibly the involvement of Mutual Aid resources. These exercises are to be authorized and coordinated by NEMA in conjunction with designated participating company or agency representative(s).

NOTE: Actual response to a Tier 2 or Tier 3 spill incident may be substituted for this required triennial exercise.

11.3 Documentation

Records of spill response training, drills, and exercises are to be maintained by facilities with approved spill response plans and by NEMA for government personnel participating in the National Spill Management Team. Lessons learned from the drills and exercises are to be used to improve this Onshore-NCP and respective facility OSRPs.

APPENDIX A CONTACTS FOR INITIAL RESPONSE

Contents

A-1. Government Contacts

Office	Contact Person and Title	Work No.	Work Fax	Cell/Home	Email
KMA	Emergency Numbers to report a spill	KMA-MRCC Emergency Numbers to report a spill: 110 (toll free number) +254 41 213 1100 +254 737 7194 14 VHF 12			
NEMA	Emergency Numbers to report a spill	**NEMA** **Incident Line to report a spill:** **0786-101100 or 0741 101 100**			
NEMA					
NEMA					
KPA	Capt. Twalib Khamis			+ 072 2415087	
KPA	Capt. Adnan Banafa			+073 3589371	
KPA	Capt. John Nguyo			+ 073 3702045	
KFS	John Karungo	0727246958			karungoj@yahoo.com
KWS	Arthur Tuda (Assistant Director – coast area)	+254 722 283769			atuda@kws.go.ke
DOSH	John Waweru (Ass. Director)				waweruam@gmail.com
KCGS	Jotham Odera	+254 721 263678			jothamodera@gmail.com
KCGS	Glenn Kamadi Majanga	+254 710 819798			majanga6@gmail.com
	Emergency Numbers to report a spill				
KPC					

A-2. Industry Contacts

Company	Contact Person	Work No.	Work Fax	Cell/Home	Email
OSMAG	Godrick M. Mwashigadi	0202494421 0202494420		722832661	
OSMAG					info@osmag.org

A-3. NGOs and Wildlife

Non-Governmental Organizations

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

Wildlife Response & Rehabilitation

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

A-4. Media / Press

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

A-5. International Response Assistance

Organization	Service	Tel.	Email
Oil Spill Response Ltd. -Southampton	Tier 3 response equipment and technical personnel	+44 (0)23 8033 1551 +44 (0)23 8033 1972	southampton@oilspillresponse.com
Oil Spill Response Ltd. -Ghana	Tier 3 response equipment and technical personnel	+233 30 279 7555 +233 30 279 7554	osrlghana@oilspillresponse.com
Polaris Applied Sciences, Inc. (USA)	Emergency Management and SCAT Specialists	+1 206 369 5686	Polaris@polarisappliedsciences.com
Owens Coastal Consultants (USA)	SCAT, Specialists	+1 206 369-3679	eowensocc@aol.com
RPS Ocean Science	Oil Spill Modeling Specialists		
Focus Wildlife International (USA)	Wildlife response, equipment and specialists	1-800-578-3048;	https://www.focuswildlife.org/contact
International Bird Rescue and Rehabilitation Centre (USA)	Wildlife response, equipment and specialists	+1 888 447 1743	https://www.bird-rescue.org/contact/contact-us.aspx
Sea Alarm (Belgium)	Oiled wildlife response, equipment and specialists	+32 (0)49 49 000 12 or +32 (0)49 96 247 72 or +32 (0)48 72 642 61	secretariat@sea-alarm.org
SANCCOB (South Africa)	Oiled seabird rescue and rehabilitation	+27 21 557 6155 or +27 78 638 3731	

A-6. Logistical Contacts

Air Transportation

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

Earthmoving Equipment

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

Laboratories

Organization	Contact Person	Work No.	Email
SGS Kenya		+254 709 633 000	

Transportation - Land

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

Transportation - Water

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

Waste Handling

Organization	Contact Person	Work No.	Work Fax	Cell/Home	Email

A-7. KPC – KOJ Terminal (Lake Victoria) Contacts

Operations

Contact Person	Telephone Number	Email
Herman Munga (Depot Manager-Ops.)	+254 722 820938	
John Chege (Senior Engineer – Ops)	+254 723 267087	

Health, Safety, and Environment

Contact Person	Telephone Number	Email
KSM KAA Safety Officer	+254 723 901875	
James Kokoyo (Safety Officer III)	+254 727 043 288	

Police

Police Stations	Landline / Telekom	Cellular Phone
Police Control Room	020 2724154	0721 23399
Flying Squad		0721116384
Central Police Station control room (KSM)		0721781693

Fire Response

Fire Stations	Landline / Telekom	Cellular Phone
Kisumu Municipal Fire Brigade	999	
Kisumu KAA Fire Chief		0722585906
Kisumu Municipal Fire Chief		0715724141
Kisumu Municipal Deputy Fire Chief		0721788040

Ambulances and Hospitals

Name	Telephone Number
AAR Emergency Ambulance in Kenya	020-2717374
Acacia Centre	072966675
Agakhan Hospital	057-2021009/4312
Ambulance Service in Kenya	112/999
AMREF Flying Doctors Ambulance Service in Kenya	020-3315454/5
Avenue Hospital	057-2024670
Avenue Rescue Services in Kenya	020-3743858
Intensive Care Air Ambulance Limited in Kenya	020-6004945
Kenya Red Cross Society Ambulance in Kenya	020-3950000
Kisumu District Hospital	057-20201717
Kisumu General Hospital	057-2020803
Phoenix Aviation Limited Ambulance Service in Kenya	020-6005837
Port Florence Hospital	057-2025426
Red Cross Ambulance	0700395395
Road Safety Network Ambulance Service in Kenya	020-2212699
St. Johns-Kisumu	999/ 0720-668405

APPENDIX B FORMS

Contents

B-1. Spill Report Form

Initial Report Form

Record as much information as is possible from initial call; however, do not delay notifications to NEMA even if all information is not available or reported.

Contact Information

A. Caller's name:
B. Caller's Contact telephone, fax, email:
C. Name of responsible party:
D. Address of responsible party:
E. Telephone/Mobile phone/email:

Spill Details

A. Date and Time of spill:
B. Location of spill:
C. Name of material spilt:
D. Source of spill: Truck number, Tank ID, Vessel name:
E. Cause of spill:
F. Amount discharged:
G. Amount in water:

Injuries / Fire /Damages

H. Injuries if any:
I. Fire or immediate risk of fire / explosion?:
J. Summary of damages:

Spill Threats

K. Persons at risk:
L. Critical systems at risk:
M. Natural resources at risk:

Actions Completed

N. Containment and clean-up actions so far:
O. Plans for further clean-up:
P. Does polluter have insurance coverage:
Q. Name of Insurer:
R. Agencies already notified:

B-2. Government Releases

Notice of Government Interest in a Pollution Incident (Sample)

To be written for specific incidents by the Ministry of the Attorney General with appropriate details by NEMA.

Sir/Madam

This to inform you that a pollution incident for which you may be financially responsible has occurred or may occur from (*asset/facility*) at (*location/ body of water*). Under the law of Kenya, the Government has interest in this incident and may take appropriate action to minimize damage which may be caused by this incident.

The discharge of oil is a violation of (*Law/Act*): _____

Under this law/act the owner or operator of the source is required to undertake removal actions. Where he refuses to take adequate removal action, he may be held financially responsible for action taken by the Government to remove and adequately mitigate the effects of the pollutant. Removal is considered effective where it is done in accordance with Government statutes and regulations and the criteria of the National Oil Spill Contingency Plan for Kenya. The adequacy of removal will be determined by the designated representatives of the Government at the scene.

These are:

_____

_____

So long as adequate actions are being taken in this matter, Government action will be limited to monitoring the progress of your actions and provisions of guidance as necessary.

If it is determined that you are not taking prompt and appropriate actions to clean-up, contain and remove the pollutant (s), Government response may be initiated. You may then be held responsible for all costs incurred by the Government as set forth in the Environmental Protection Act, as amended. Should you require further information you may contact:

Name: _____
Position: _____
Telephone: _____ Fax: _____ Email: _____

Signed: _____ Date / Time: _____

Received and acknowledged

Name of Addressee: _____ Date and Time: _____

Notice of Government Assumption of Response (Sample)

To be written for specific incidents by the NEMA Director General in conjunction with the IMT-Information Officer and approved by Unified Command prior to release.

Sir/Madam

My letter of (date) notified you of Government interest in an actual or potential incident at (_____ _____) for which you are presently considered financially responsible.

You are hereby given notice that your actions to abate this threat and to remove the pollutant (s), and to mitigate (its/their) effects have been evaluated as unsatisfactory by _____.

Effective (date/time) the _____will conduct all response activities in accordance with the National Oil Spill Contingency Plan of Kenya and the Country's laws and regulations. You subsequently will be billed for actual costs incurred by the Government as set forth.

Should you require further information concerning this matter you should contact:

_____

_____

Signed: _____

Date / Time: _____

Received and acknowledged

Name of addressee: _____Date / Time: _____

Initial Press Release (Sample)

To be prepared by NEMA in conjunction with the IMT-Information Officer and approved by Unified Command prior to release.

Press Release 1 (Date: _____ **Time**: _____**)**

An oil spill has occurred at: _____ from: _____. The spill was discovered (reported) at: _____ (time) on: _____(date).

The following areas have been affected:

The cause of the spill is being investigated by: _____(agency), and clean – up operations are underway by: _____.

The product/material(s) spilled is/are: _____

The amount of product spilled is: _____ or is not known or is being calculated by: _____

Brief statement of operations being undertaken and by whom:

The split material is/is not considered to be a health hazard. The following precautions should be taken by members of the public in the_____area(s):

<List precautions>

Further updates will be given at: _____and/or posted on the following website: _____ _____.

B-3. Incident Command Forms

The most common ICS forms used in spill response are available online: (https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/response-tools/electronic-incident-command-system-ics-forms.html).

Form number	Name
IAP Cover Sheet	Incident Action Plan Cover Sheet
ICS 201	Incident Briefing
ICS 202	Incident Objectives
ICS 203	Organization Assignment List
ICS 204	Assignment List
ICS 204a	Assignment List Attachment
ICS 205	Incident Radio Communications Plan
ICS 206	Medical Plan
ICS-207	Organizational Chart
ICS 208	Site Safety Plan
ICS 209	Status Summary (SITREP/Opsum)
ICS-210	Status Change
ICS 211	Check-In List
ICS 213	General Message
ICS 213-RR	Resource Request
ICS-214	Unit Log
ICS-214A	Chronology of Events Log
ICS 215	Operational Planning Worksheet
ICS 220	Air Operations Summary
ICS-221	Demobilization Checkout
ICS-230	Daily Meeting Schedule
ICS-232	Resources at Risk Summary
ICS-233	Open Action Tracker
ICS-234	Work Analysis Matrix
ICS-235	Facility Needs Assessment
ICS-237	Mishap Reporting Worksheet
ICS-261	Incident Property Tracking Worksheet

Forms to be included in the Incident Action Plan (IAP) for each operational period

The most common ICS forms to be included in the IAP are:

Form number	Name
ICS 202	Incident Objectives
ICS 203	Organization Assignment List
ICS 204	Assignment List (one for each division or group that will conduct field tasks during the next operational period)
ICS 205	Incident Radio Communications Plan
ICS 206	Medical Plan

B-4. Shoreline Cleanup Assessment Technique (SCAT) Forms

The most common SCAT forms used in spill response are available at the Kenya National SCAT Guideline Manual and online at http://www.shorelinescat.com/Forms.html

B-5. Hydrocarbon Release Memorandum of Understanding (MOU) Template

The Hydrocarbon Release MOU Template is an agreement to be used by NEMA and other agencies, local governments, and other response or support organizations to assist and define the relationship between the involved parties during the response operations and recovery efforts. The content of this MOU template has been modified from the United States Federal Emergency Management Agency (FEMA) Disaster Specific Memorandum of Understanding. Instructions in this template (*written in italic and blue font*) need to be customized to the specific agencies or organizations signing the MOU.

Recommended content and a template includes:

i. Purpose

"The [*insert Agencies that will collaborate with the lead agency*], enter into this Memorandum of Understanding (MOU) to unify and expedite the response operations and recovery projects that are associated with the disaster [*insert hydrocarbon release incident name*]. This MOU is to formalize the commitments among the listed Agencies to work together to facilitate uniformity, consistency, and transparency by setting forth roles and responsibilities for Lead and Cooperating Agencies, establishing interagency communication protocols (or procedures), and identifying response priorities related to this disaster."

ii. Background

[Insert specific information on the hydrocarbon release incident; e.g. location, description of impacted area, type of incident, etc.]

iii. Existing Agreement

[Insert any specific agreement that the Parties can shared with each other]

iv. Responsibilities of Parties

[Use this section to identify when parties are responsible as Lead Agency or Cooperating Agency during coordinated response effort. Insert the role of the lead agency and any expectation of the other Parties. Describe when and how any Parties' funding or program will be utilized. Describe Parties' expectations]

v. Commitments of Agencies

The Parties hereby commit, to the extent practicable, to early involvement and cooperation to ensure timely decisions are made and that the responsibilities of each Party are met. The Parties commit to working together and as appropriate with National and County agencies and other interested persons. In particular the Parties agree to:

A. Timely Coordination: Cooperating Agencies will submit reviews in accordance with the timeline for each project established by the Lead Agency with the concurrence of Cooperating Agencies.

B. Project Meetings: Parties will meet every *[insert time length]* to share project developments, project status, and project reviews.
C. Interagency Communication: The Cooperating Agency will notify the Lead Agency when it determines it has no related action and further participation is no longer warranted.
D. Project Development: Lead Agency, in conjunction with Cooperating Agency(ies), will provide recommendations for avoidance, minimization, and mitigation at the earliest stage possible in project development.
E. Personnel and Expertise: Cooperating Agencies will provide appropriate personnel and/or expertise to the Lead Agency, as appropriate, and as resources allow.
F. Provide Data and Studies: Cooperating Agencies will be responsible for the provision of any information necessary to complete application reviews and authorizations in accordance with the target timeline established by the Lead Agency with the concurrence of Cooperating Agencies.
    a. Lead Agencies, where appropriate, will provide to the Cooperating Agency(ies), Applicant or the prospective Applicant relevant studies, data (such as maps), and any other information concerning the status of matters the Party considers relevant, including matters that may be under consideration, such as [insert examples of types of activities].

vi. Duration

This MOU shall remain in effect for only *[Insert here a reasonable period of time agreed by all the Parties that allow the intent of the MOU to be effective. This should cover a period of time for the National-IMT to be demobilized and agencies representatives to conduct incident response lessons learned]*. Prior to such time, Parties may consult to reconsider the terms of this MOU and extend it for another term. Any extension should be made or captured in writing. Prior to such an extension the Parties may amend the MOU in accordance with Stipulation VII below.

vii. Amendments

This MOU may be amended when such an amendment is agreed to in writing by all Parties. The amendment will be effective on the date a copy of the amended MOU has been signed by all of the Parties.

viii. Termination

If any Party determines that the terms of the MOU will not or cannot be carried out, that Agency shall immediately consult with the other Parties to develop an amendment in accordance with Stipulation VI, above. If within thirty (30) days *[Insert another time period agreed to by all Parties]* an amendment cannot be reached, any Party may terminate the MOU upon written notification to the other Parties.

ix. Signatures

[Insert all Parties Organization or Agency name, Agency's representative name and title, and signatures]

APPENDIX C SPILL RESPONSE AND LOGISTICAL RESOURCES

Contents

C-1. Spill Response Resources

Locations of spill response equipment and approximate delivery times are provided in Figure 7-1

Safety and Monitoring

Insert list of spill response safety and air monitoring equipment

C-2. Spill Response Equipment in KOT Warehouse in Mombasa

Containment Equipment

Name	Length (m)			
	Overall Size (mm)	OSMAG Owned	OSMAG Members	KPA
Fence Boom (Light Duty)	1,100	500	0	0
Fence Boom (Light Duty)	750	800	300	0
Fence Boom (Light Duty)	450	0	220	300
Shore sealing Boom (Light Duty)	550	0	0	735
Shore sealing Boom (Light Duty)	750	350	0	0
Sorbent Boom (Polypropylene)	100 diameter	144	477	0

Storage Capacity

Name	QUANTITY (Units)				
	Capacity (m^3)	OSMAG Owned	OSMAG Members	KPA	Total per tank (m^3)
Open-top framed tanks	10	7	2	3	120
Open-top framed tanks	7.5	1	0	0	7.5
Open-top framed tanks	5	1	1	0	10
Open-top self-erecting tanks	6	0	2	0	12
Open-top self-erecting tanks	5	0	1	0	5
Floating storage	10	4	4	1	90
Floating storage	12.5	0	2	0	25
Floating storage	50	0	1	0	50
Vacuum tank	10	1	1	1	30
TOTAL (m^3)	-	132.5	167	50	349.5

Recovery Capacity

Name	QUANTITY (Units)				
	Capacity (m^3/hr)	OSMAG Owned	OSMAG Members	KPA	Total Capacity (m^3/hr)
Disc Skimmers	10	0	1	0	10
Disc Skimmers	12	0	3	1	48
Disc Skimmers	16	2	0	0	32
Disc Skimmers	20	0	1	1	40
Disc Skimmers	40	0	0	1	40
Brush Skimmers	16	1	0	0	16
Brush Skimmers	30	1	0	1	60
Weir Skimmers	30	2	0	4	180
Vacuum Skimmer	12	0	0	1	12
Vacuum Skimmer	30	1	3	1	150
Ro-Mop Skimmer	10	1	1	0	20
Sorbent Pads	-	2,000	0	0	-
TOTAL (m^3/hr)	-	178	166	264	608

Transfer Pumps

Name	QUANTITY (Units)				
	Capacity (m^3/hr)	OSMAG Owned	OSMAG Members	KPA	Total Capacity (m^3/hr)
Submersible Screw pump	100	0	0	1	100
Positive Displacement Pump	91	1	0	0	91
Positive Displacement Pump	30	0	7	1	240
Peristaltic Pump	18	2	2	1	90
TOTAL (m^3/hr)		127	246	148	521

C-3. Spill Response Equipment in KPRL, Mombasa

Source	Boom	Rope Mop Skimmers	Disc Skimmer	Boat Mountable Sea Sprayer	Dispersant Litre (m^3)
Description:	Troil boom GP750	Rope Mop OM240DP, diesel Power Pack, internal transfer pump, 2 mops 25 m each	Disk Skimmer, Komora 12K MK III, diesel Power Pack with spate pump 75c	Lombardini Sea Sprayer, 2x4 spray bows, 2no. 50 m Lances with spray guns	Corexit 9527
Capacity	15 m				20 L Plastic Jerricans
Quantity	20 sections	1	1	1	15
Total	300 m				300 L (0.3)

C-4. Spill Response Equipment in KPC – Kisumu Oil Jetty (Lake Victoria)

Type of Equipment	Capacity	Quantity	Total
Vikoma Floating tank	12,000 L	1	12,000 L
Vikoma flexi boom/fence booms	500mx5m?	10	5,000 m?
Komara duplex skimmer	1.5 m^3	1	1
Vikoma GP 10 Power Pack		1	1
Vikoma IMP 65 transfer pump		1	1
Sorbent booms	4 Per Pack	5	20 boom (X m)
Sorbent pads	200 per bale.	6	1,200 pads
Sorbent Socks	20 per Box	3	60 socks (diameter, length?)
Sorbent Pillows	10 Per Pack	5	50 pillows (size?)
PPE-Life Jackets		50	50 units

C-5. Logistical Resources

Aircraft

Location	Equipment	Description	Capacity	Condition
Nairobi	NEMA Aircraft	…		
Nairobi	KWS Aircraft	…		

Estimated number of personnel available for Emergency Response:
Airwing: Fixed Wing – Pilots (…) , Crew (…) Rotary Wing – Pilot (…), Crew (….)

Paved Runway Airports in Kenya

Town	Airport name	ICAO	IATA	Usage	Customs	IFR	Rwy length
Amboseli	Amboseli	HKAM	ASV	Civ.	No	No	3200 ft
Bamburi	Bamburi		BMQ	Civ.	No	No	3200 ft
Bungoma	Bungoma	HKBU		Priv.	No	No	2300 ft
El Wak	El Wak			Civ.	No	No	3200 ft
Eldoret	Eldoret	HKED	EDL	Civ.	No	No	4300 ft
Eldoret	Eldoret Intl	HKEL		Civ.	Pto.	Yes	11400 ft
Garissa	Garissa	HKGA	GAS	Civ.	No	Yes	3900 ft
Homa Bay	Homa Bay	HKHB		Priv.	No	No	2600 ft
Isiolo	Isiolo	HKIS		Civ.	No	No	5000 ft
Kakamega	Kakamega	HKKG		Civ.	No	No	3900 ft
Kalokol	Ferguson's Gulf	HKFG	FER	Civ.	No	No	3200 ft
Kapchomuswo	Kabarnet			Civ.	No	No	5200 ft
Keekorok	Keekorok	HKKE		Civ.	No	No	4200 ft

Town	Airport name	ICAO	IATA	Usage	Customs	IFR	Rwy length
Kisii	Kisii	HKKS		Priv.	No	No	2700 ft
Kisumu	Kisumu	HKKI	KIS	Civ.	O/R	Yes	6600 ft
Kitale	Kitale	HKKT	KTL	Civ.		No	4700 ft
Kitui	Kitui			Civ.	No	No	3100 ft
Lamu/Manda	Lamu/Manda	HKLU	LAU	Civ.	O/R	No	3200 ft
Lodwar	Lodwar	HKLO	LOK	Civ.	No	No	3200 ft
Loyangalani	Loyangalani	HKLY	LOY	Civ.	No	No	3600 ft
Malindi	Malindi	HKML	MYD	Civ.	O/R	Yes	4600 ft
Mandera	Mandera	HKMA	NDE	Civ.	No	No	3600 ft
Mara Serena	Mara Serena		MRE	Civ.	No	No	3300 ft
Marsabit	Marsabit	HKMB	RBT	Civ.	No	No	3200 ft
Meru	Mulika Lodge	HKMK		Civ.	No	No	3200 ft
Migori	Migori			Civ.	No	No	3600 ft
Mombasa	Moi	HKMO	MBA	Civ.	Yes	Yes	11000 ft
Moyale Lower	Oda	HKMY	OYL	Civ.	No	No	4200 ft
Musiara	Musiara			Civ.	No	No	3900 ft
Nairobi	Eastleigh	HKRE		Mil.	No	No	7900 ft
Nairobi	Jomo Kenyatta	HKJK	NBO	Civ.	Yes	Yes	13500 ft
Nairobi	Wilson	HKNW	WIL	Civ.	Yes	No	5100 ft
Naivasha	Naivasha	HKNV		Civ.	No	No	3600 ft
Nanyuki	Nanyuki	HKNY	NYK	Civ.	No	No	3900 ft
Nyeri	Nyeri	HKNI	NYE	Civ.	No	No	3900 ft
Olkurruk Mara	Olkurruk Mara			Civ.	No	No	4100 ft
Samburu South	Buffalo Spring	HKSB	UAS	Civ.	No	No	3200 ft

Town	Airport name	ICAO	IATA	Usage	Customs	IFR	Rwy length
Ukunda	Ukunda			Civ.	No	No	3900 ft
Webuye	Webuye			Civ.	No	No	3600 ft

Codes:

- **ICAO: International Civil Aviation Organization**
- **IATA: International Air Transport Association**
- **Civ.: Civil airport, open for public use (including joint use)**
- **Mil.: Military airport, not open for public use**
- **Priv.: Private airport, not open for public use**
- **IFR: indicates if the airport has any officially published instrument approach procedure**

Source: http://www.aircraft-charter-world.com/airports/africa/kenya.htm#explanations

Communications

Insert list of national communication resources

Trucking

Insert list of national trucking resources

Heavy Equipment

Insert list of national heavy equipment resources

APPENDIX D CROSS-BOUNDARY MOVEMENT OF EQUIPMENT AND PERSONNEL

Contents

D-1. Procedure for Inter-country Movement of Personnel and Equipment

If after an assessment of the oil spill response capacity by the requesting State or Territory (the National Incident Management Team or National-IMT, in the case of Kenya), it is decided that assistance is required from a neighboring State or Territory; an alert message to the affected or potentially impacted Countries shall be issued. The responding State or Territory will respond with an acknowledgement that equipment and operating personnel can or cannot be provided.

In order to facilitate the movement of response personnel and equipment the requesting Party will:

- make arrangements for the rapid entry (and exit) of equipment, products and personnel prior to their arrival and ensure that customs formalities are facilitated to the maximum extent. Equipment should be admitted on a temporary basis and products should be admitted free of excise and duties.
- ensure that, should ships and aircraft be provided, ships are granted all necessary authorizations and aircraft cleared to fly in the national air space. A flight plan or a flight notification will be filed and accepted as an authorization for aircraft to take off, land ashore or at sea outside regular customs airfields.

Personnel

To expedite the entry of emergency personnel into the requesting State or Territory, the acknowledgement message to the requesting State or Territory shall list all personnel by name and pertinent passport information. The message shall also include the mode of transportation such as flight

numbers, vessel name, port of entry and estimated time of arrival. The requesting State or Territory, upon receipt of the information, shall make all arrangements for entry of the emergency responding personnel with the National Immigration Department. Arriving personnel will report to the Logistic Section of the National-IMT and, until released, shall follow his directions and strategies. Each Member State or Territory shall have designated personnel who can be spared to assist the other member States or Territories in case of emergency situations. Passports and other travel documents of these designated personnel shall be kept up-to-date and ready at all times.

Equipment

The requesting Party, State or Territory (Planning Section of the National-IMT in the case of Kenya) shall itemize the equipment that it desires to be transferred to the spill site or port of entry by referencing the type, name, size, etc.. The responding State or Territory will contact the owner of the equipment and determine the availability of the equipment and so advise the requesting State or Territory.

When the equipment has been assembled for shipment, the responding State or Territory will notify the requesting State or Territory of the mode of transportation and the estimated time of arrival at the spill site or port of entry. Ownership of all equipment will be clearly identified by labels indicating owners name and address.

The requesting State or Territory, upon receipt of the information that the equipment is ready for shipment, shall notify the national customs department for entry of the equipment without assessment, duty payments or unnecessary delays.

When the requesting country has finished with the equipment, it will clean each piece of equipment and make any necessary repairs to ensure that the equipment is returned to the responding country in good working order. The equipment will be inventoried against the shipping documents, noting any missing or excessively damaged equipment. After the equipment has been returned, the Lead agency will arrange for the equipment to be returned to the owner. The owner will make a final inspection of the equipment and promptly notify the Lead Agency of any discrepancies.

D-2. Overfly procedures

Within the framework of the Plan and upon a specific request of the Lead State, aircraft of the other Parties might be allowed to enter and operate in the airspace of the Lead State for one of the following purposes:

- search and rescue;
- surveillance flights;
- transportation of response personnel, equipment and products;
- spraying of dispersants or other treatment products;

Each Party will make, in advance, the necessary arrangements concerning the rapid granting of permits and clearances for civil aircraft (fixed wing or helicopters) of the other Parties who might be requested

to take part in response operations within its airspace. Similar arrangements will be made for the use of airport facilities by civilian fixed wing aircraft and helicopters engaged in Joint Response Operations.

Overflying for the above-mentioned purposes, of the national territory or territorial waters of one of the Parties by military aircraft of the other Parties will be decided on a case-by-case basis by the Parties concerned.

D-3. Financial Procedure for Movement of Personnel and Equipment

Personnel

This Onshore-NCP (by activating any Tier 3 assistance agreement) envisions the movement of specialized personnel between States or Territories, who are trained to operate pollution abatement equipment or managing specific functions to be integrated into the National-IMT. These personnel may be qualified as oil spill response specialist (e.g., scientists, response managers, technicians), or as operators for specific technical equipment. This Onshore-NCP does not envision the inter- country movement of unskilled personnel. Unless special arrangements are made between the Lead Agencies during the time of mobilization concerning the funding associated with the movement of personnel, the following procedures will be adhered to.

After an agreement is reached between the Lead Agencies as to the number and qualifications of the personnel needed to assist the requesting State or Territory, the responding State or Territory will purchase round trip airfare tickets to the requesting State or Territory for the responding personnel. Wages for the assisting personnel will be paid by the responding State or Territory for the duration of the time the personnel are away from their Home State or Territory or place of normal employment.

All living expenses for the responding personnel will be paid by the requesting State or Territory who will be responsible for subsistence and quarters for the responding personnel. Unless otherwise agreed between the Lead Agencies of the requesting and responding States or Territories, the normal length of stay for personnel working away from their home country will not exceed 60 days.

When the responding personnel return to their normal place of employment, the responding Lead Agency will prepare an invoice for services rendered in keeping with its published price list. The invoice will include the transportation cost associated with mobilization and demobilization of the responding personnel. All personnel will be listed on a Daily Work report which will indicate job title, hours worked, hourly rate, and other incurred expenses.

The assisting Lead Agency will submit the invoice for personnel services to the Lead Agency of the requesting State or Territory, who will make prompt payment. The requesting State or Territory will, in turn, include the paid invoice from the responding State or Territory in the final invoice, which will be submitted to the spiller or his insurance carrier for reimbursement.

In the event any personnel are injured or become ill, the requesting State or Territory will be responsible for all the expenses incurred while in its jurisdiction and for other expenditures involved in the repatriation of injured or ill personnel.

Equipment

This Onshore-NCP envisions the inter-country movement of specialized equipment which may be located at various sites within States or Territories. After a request has been received and agreed to by the receiving State or Territory, the responding State or Territory will make all arrangements for the transportation of the pollution abatement equipment to a place of disembarkation. When all of the equipment has arrived at the mobilization areas, the responding State or Territory will arrange for further air or sea transportation of the equipment to the spill site or other agreed upon destination. All equipment will be clearly identified as to the owner and storage location, as equipment may become commingled with equipment from a number of sources.

The Lead Agency of the responding State or Territory will prepare an invoice for use of the equipment, including all mobilization and demobilization cost. Rental rates for the equipment will be shown on a Daily Work Report which will correspond with the published price, **to be approved by the Lead Agency of the receiving State or Territory prior to mobilization**. Any missing or severely damaged equipment will be listed on the invoice. The complete invoice for the use of the pollution abatement equipment will be forwarded to the Lead Agency of the requesting State or Territory, who will make prompt payment to the responding State or Territory. The Lead Agency of the requesting State or Territory will include the paid invoice from the responding State or Territory in the final invoice, which will be submitted to the spiller or his insurance carrier for reimbursement.

Obligation to Pay for Services Rendered

In all cases, unless other arrangements have been agreed to, the requesting State or Territory is obligated to pay the responding State or Territory for their cost of mobilization and demobilization of personnel and equipment, including the wages for responding personnel and the rental rate for the equipment requested.

APPENDIX E GUIDANCE FOR FACILITY OIL SPILL RESPONSE PLANS

Contents

Operation- and location-specific contingency plans must be developed for operations entailing bulk oil transport or that meet international criteria for spill planning. These plans are required to satisfy regulations and/or international standards. Specific types of spill response plans (SRPs) include oil production, transferring, transportation and storage facilities.

Facility SRPs should meet internal best practice, company policies, and also be consistent with this Onshore-NCP.

Facility SRPs should reference and contain a brief summary of any other company-specific emergency plans. Facility SRPs, addressing potential onshore spills in Kenya, must be submitted to NEMA for review and reference as those plans should details spill risks from the operations covered, detail emergency points of contact, and list resources for Tier 1 response.

Guidelines have been designed to help in the preparation of Local and Facility Spill Response Plans in cases of contamination by hydrocarbons and other potentially dangerous or injurious substances (e.g., ARPEL Guideline on Oil Spill Contingency Planning and Management (1997), IPIECA's Guide to Contingency Planning for Oil Spills on Water (2000)).

The following is a guide of the minimum content expected to be included in a Facility SRP.

E-1. General Content for Facility Spill Response Plans

(modified from IMO 2015, Manual on Oil Pollution, Section II – Contingency Planning, 4th Edition)

Introduction

- Overall response priorities and objectives
- Plan scope (including a summary description of operations and risks)
- Geographical area of coverage
- Integration with other plans
- Document control (plan custodian, distribution, review and update records)

Initial actions

- Initial actions and strategy decision guide

- Initial site safety and spill assessment
- Initial response priorities and objectives
- Initial action checklists for key personnel
- Immediate notifications and reporting
- Activation of response management team
- Environmental assessment results; including identification of environmental and socio-economic sensitivities
- Immediately available Tier 1 resources and contacts
- Activation and deployment of Tier 1 resources
- Response escalation procedures
- Key facility information

Notifications and reporting

- Internal requirements and procedures
- External requirements and procedures
- Supplemental notifications, if any
- Contact details and forms (included either within the main body of the plan or as a separate directory for ease of frequent updating)

Assessments

- Site health, safety and security assessments
- Spill surveillance methods (aerial surveillance, tracking buoys, etc.)
- Spill observation and assessment guidance
- Meteorological and hydrodynamic forecasting
- Spill trajectory and modeling
- Tier level assessment and escalation potential

Response resources

- Resource inventories and services list including required logistics support, contact information and mobilization times (included either within the main body of the plan, or as a separate directory if lists are extensive and/or frequent updates are anticipated)
- Vacuum or tank-trucks (specifications, lists of locally available resources, etc.)
- Local labor sources and volunteers
- Subject matter experts or specialty expertise

Response management

- Response organization
- Roles and responsibilities
- Management processes and procedures
- Response management facility activation and location

Sensitive areas

- Identification of sensitivities
- Protection priorities
- Sensitivity maps (include either a full set of maps within the main body of the plan, or a reference list of maps that are supplied in a separate document or GIS; the best arrangement will depend on the volume, size and type of maps)
- Operational sensitivity maps/site-specific tactical plans/geographical response plans (include a full set within the main body of the plan, or a reference list of maps/plans that are supplied in a separate document; the best arrangement will depend on the volume and size of the material)

Response strategy

- Strategy decision guidance (flow charts, scenario matrix, NEBA decision guidance, etc.)
- Scenario-specific response strategy summaries
- Response capabilities, as applicable
- Regulatory pre-approvals and/or approval application procedures
- General tactical plans, if any (included either within the main body of plan or as separate documents)

Waste management

- Regulatory requirements
- Procedures (including segregation, minimization, site removal, etc.)
- Guidance for developing spill-specific waste management plan
- Pre-designated temporary storage sites
- Treatment and final disposal arrangements or options

Demobilization

- Decontamination
- Procedures (final equipment and vessel inspections, personnel checkout, resupply of consumables, claims for repairs, return of hired gear, etc.)
- Guidance for developing a spill-specific demobilization plan

Termination of response

- Guidance on establishing treatment end points and response termination criteria
- Designation of the roles with authority to sign off on completed areas and approve termination of the response
- Response debriefs
- Responsibilities and guidelines for conducting a post-spill analysis

Potential appendices or supporting documentation

General response information

- Health and safety guidelines, including Safety Data Sheets
- In-field communications
- Documentation requirements and forms

Frequently updated information or large volumes of material

- Resource and contact directories
- Site-specific plans
- Sensitivity maps and general tactical plans

Background information

- Description of the facility and/or operations (including facility information, oil types and volumes handled, oil properties and weathering data, etc.)
- Baseline environmental and socio-economic information
- Meteorological and environmental information (including both prevailing and limiting/extreme conditions)

APPENDIX F SAFETY DATA SHEETS

Contents

F-1. Automotive Gas Oil (AGO); alias: Automotive Diesel

F-2. Industrial Diesel Oil (IDO); alias: Industrial Diesel

F-3. Dual Purpose Kerosene (DPK); aliases: Turbine Kerosene (ATK), Jet A1, Aviation Fuel

F-4. Motor Spirit Premium (MSP); aliases: Premium Motor Spirit (PMS), Petrol, Gasoline

F-5. Heavy Fuel Oil (HFO)_Bunker

F-6. Crude Oil

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APPENDIX G: OIL SPILL SCENARIOS

Content

Appendix G provides examples of oil spill scenarios and the type of initial response and environmental datasets analysis that should be conducted once this Onshore-NCP is activated.

Immediate response actions and initial response objectives (to be summarized in the ICS 201 forms for any hydrocarbon release response) includes following assumptions:

- Tier 1 and 2 response plan (for example a facility response plans in the case of a release initiated from an operator facility or asset such as pipelines and well blowout scenarios) are aligned with the response structure of this NCP, including but not limited to:
  - Initial response, notifications, and reporting (Section 2 of this NCP)
  - General and role specific checklist (Appendix H of this NCP)
- A memorandum of understanding (MOU) is in place between NEMA (in coordination with other agencies) and the appropriate response organization (e.g., the OSMAG Society).

Using ICS-201 forms, this appendix describes the initial response actions to a hypothetical truck-tank scenario. The ICS-201 form shows activities conducted during the first operational period in the response process. Once activated, the IMT will create a spill specific safety plan and the product fate and behavior forecast, among other IMT responsibilities described in Section 5. An Incident Action Plan (IAP) will be developed by the IMT for each subsequent operational period; forms to be included in the IAP are listed in the Appendix B. Examples of the key actions taken during the initial response are described and initial deployments noted. Tiered response actions would be developed as part of the IAP and documented.

This appendix also shows three case studies from the API Technical Report 425 (Options for Minimizing Environmental Impacts of Inland Spill Response) that highlight initial response actions and objectives that can be used in similar events in Kenya.

G-1. Tanker Truck Roll Over Scenario

Description:	A truck-tank rolled over between Nairobi and Nakuro releasing diesel into a stream that then feeds Lake Elementaita
Oil Type	Diesel Fuel Oil API: 35 API Pour Point: -7 C° Flash Point: 70 C°
Spill Volume:	Total spill volume is 68T (500 bbl)

Mass Balance Analysis and Spill Trajectory

The mass balance shows an evaporation rate of almost 63% (42T or 311 bbl) during the initial 5 days with approximately 25 T (185 bbl) remaining on the surface (Figure G-1). During weathering, the diesel viscosity increases from 3.0 cSt to more than 12 cSt at 27°C and density from 0.827 g/cc to 0.924 g/cc (remaining lighter than the receiving water) in the same period of time.

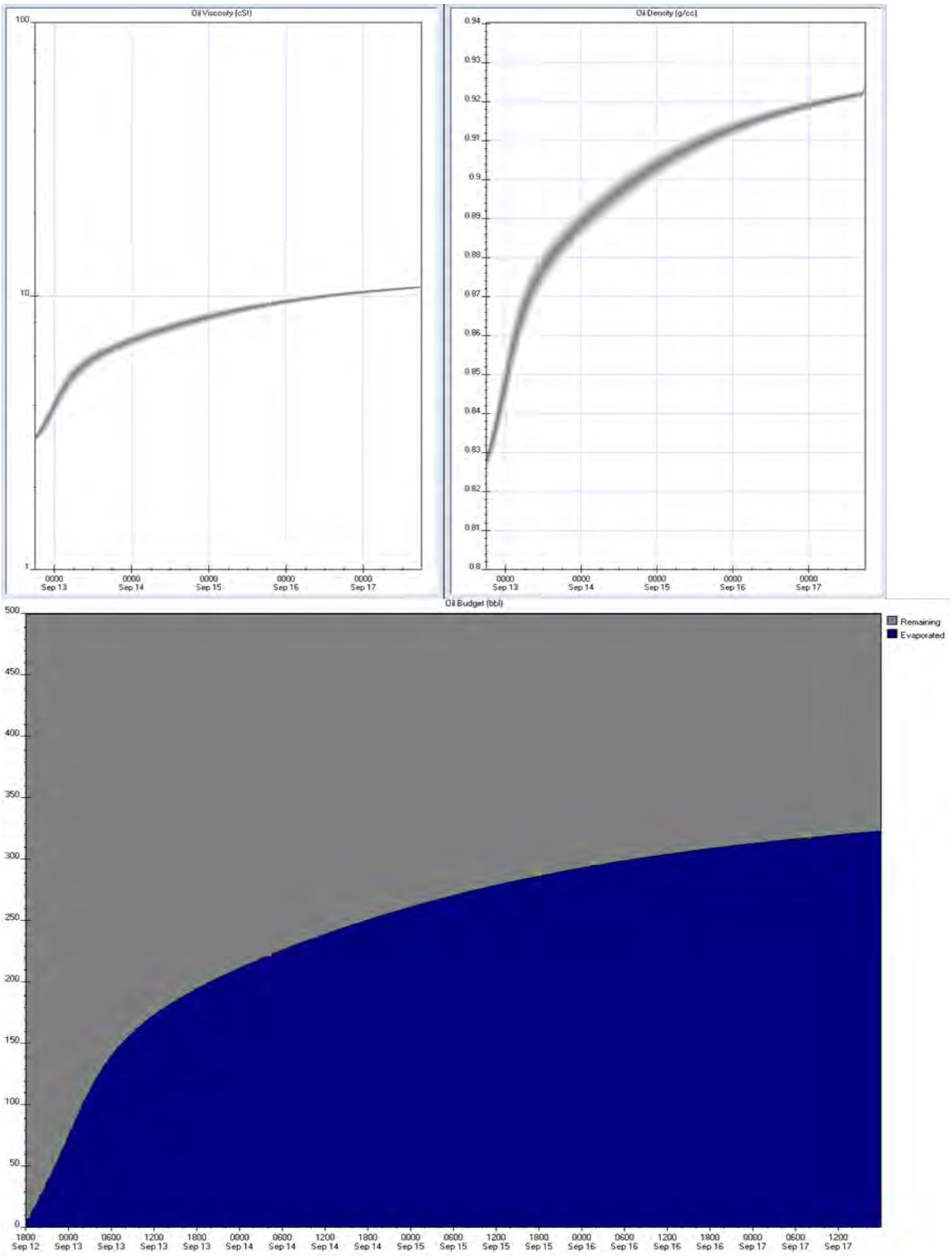


Figure G-1. Mass balance of Scenario 1 simulation: 64 T (500 bbl) of diesel spill to water modelled over 5 days. Top-left: changes in oil viscosity (cSt). Top-right: Density (g/cc). Bottom: Volume remaining and evaporated.

1. Incident Name Nakuro Truck-tank	2. Prepared by: Polaris Applied Sciences Date: OP1 (24 hr) Time: 09:00	INCIDENT BRIEFING ICS-201-1 (pg 1 of 4)

3. Map / Sketch

Description:
At approximately 06:00 due to a traffic accident in heavy rain, a truck-tank rolled over between Nairobi and Nakuro releasing approximately 68 T of diesel. The spilt oil reached a creek that feeds Lake Elementaita (approximately 40 km north of Naivasha).

INCIDENT BRIEFING		ICS 201 (pg 1 of 4)
1. Incident Name	2. Prepared by: Polaris Applied Sciences	INCIDENT BRIEFING

Nakuro Truck-tank	Date: OP1 Time: 0900	ICS-201-2 (pg 2 of 4)

4. Initial Incident Objectives
   - establish isolation perimeter to keep community members at least 50 m away from spilled hydrocarbon
   - ensure safety of responding personnel
   - minimize environmental impact

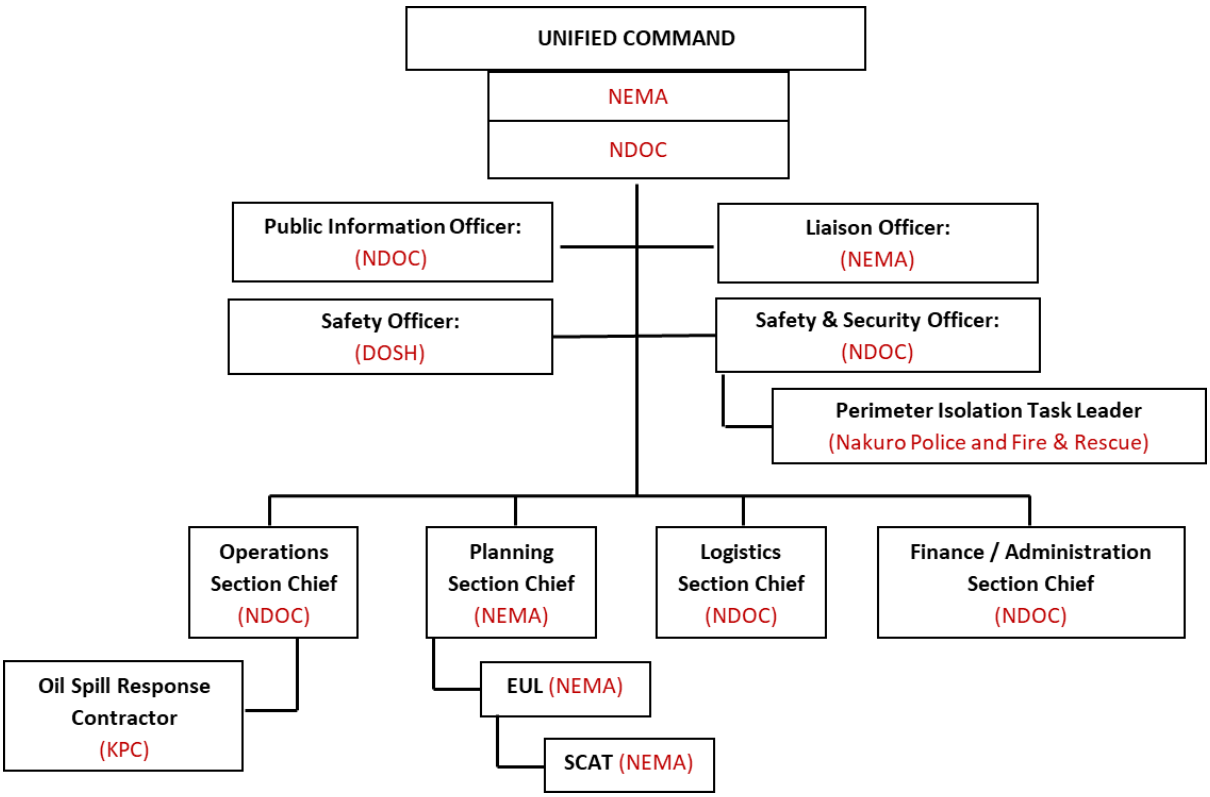
5. Summary of Current Actions

Time	Action / Note
0700	Police and fire and rescue services in Nakuro activated and requested NDOC to manage response and KPC support to handle hydrocarbon related tasks
0701	NDOC requested Nakuro Police and Fire and Rescue Services to establish isolation perimeter to keep community members at least 50 m away from spilled hydrocarbon
0703	NDOC requested DOSH support as Safety Office
0705	KPC in Naivasha activated a local Oil Spill Response Contractor or Organization (OSRO) to support with oil spill
0715	Oil spill response contractor activated
0720	Driver deployed sorbent boom and isolation cones to alert other drivers and community members about risk of fire and explosion
0730	Police arrives onsite
0735	Community informed of the spill trajectory along the creek towards lake Elementaita
0825	KPC representative and KPC's contractor (OSRO) arrives on site
0830	County NDOC assumes the On-Scene Commander position. Ensures that isolated safety zones are secured.
0900	NEMA arrives and starts assessing resources at risk and establishes Unified Command with NDOC
0915	Environmental Unit representative onsite (NEMA) recommended the OSRO to use flooding technique along the creek instead of pressure (high or low) washing technique, and adding underflow (weir) dams and vacuums trucks
0930	Sorbent booms and pads deployed along the creek and contained with booms at the lake
10:30	Underflow (weir) dams built and vacuum trucks arrived

INCIDENT BRIEFING ICS 201 (pg 2 of 4)

1. Incident Name Nakuro Truck-tank	2. Prepared by: Polaris Applied Sciences Date: OP1 Time: 09:00	INCIDENT BRIEFING ICS-201-3 (pg 3 of 4)

6. Current Organization



INCIDENT BRIEFING ICS 201 (pg 3 of 4)

1. Incident Name Nakuro Truck-tank	2. Prepared by: Polaris Applied Sciences Date: OP1 Time: 09:00	INCIDENT BRIEFING ICS-201-4 (pg 4 of 4)

7. Resources Summary

Resources Needed	Time Ordered	Resources Identifier	ETA	On-Scene? (X)	NOTES: (Location / Assignment / Status)
Shore sealing boom (750 mm boom height): 350m	0710	Operations Section	0800	X	KPC Warehouse / available
Pumps and shore washing systems	0710	Operations Section	0800	X	KPC Warehouse / available
Anchors/tow bridles/anchor posts (3 per section) (4/4/12)	0710	Operations Section	0800	X	KPC Warehouse / available
2 weir skimmers, 1 disk skimmer	0710	Operations Section	0800	X	KPC Warehouse / available
8 Temporary storage – 10m3 open top framed tanks	0710	Operations Section	0800	X	KPC Warehouse / available
5 Temporary storage – 10m3 open top framed tanks	0710	Operations Section	0800	X	KPC Warehouse / available
2 Vacuum Trucks	0800	Operations Section	0800	X	Nakuro local contractor / available
PVC pipes and sand bags to build underflow (weir) dams	0920	Operations Section	0800	X	Nakuro local contractor / available

INCIDENT BRIEFING ICS 201 (pg 4 of 4)

G-2. API Technical Report - Case Studies

Name: Aliceville, Alabama Rail Cars	**Date**: 8 November 2013	**Oil Type Spilled**: Light crude oil **Volume Spilled:** 17,857 bbl

Location: Freshwater wetland, 1 hour southwest of Tuscaloosa, Alabama

Summary: A 90-car crude oil unit train was heading to a pipeline injection terminal in Walnut Hill, FL when 26 rail cars derailed and caught fire. The derailment occurred in an isolated wetland. Due to fire danger and difficulty accessing the tank cars, first responders decided to allow the railcars to burn out. An estimated 12,800 bbl of oil discharged into a wetland.

Aerial photo of the spill site on 10 November 2015

Responding crews had to create access roads to transport equipment to the spill site. Road construction and rail wrecking operations required personnel to be working in close proximity to heavy equipment. With multiple contractors conducting different activities in the same congested area, there were risks of personnel being struck by heavy equipment. The use of spotters helped reduce those risks.

Community air monitoring was conducted throughout the response for VOCs, benzene, toluene, xylene, NO_2, SO_2, H_2S, CO, and particulates. At the derailment site, particulates were as high as 2 mg/m^3, and benzene was up to 0.3 ppm. Peak concentrations downwind of the derailment were 385.1 $\mu g/m^3$ particulate and of 2.6 ppm total VOCs. Work place air monitoring was conducted during the entire response. A benzene worker exposure program was initiated, of a representative population of workers by work task and potential exposure to petroleum vapors. Selected workers wore benzene dosimeter badges that were sent offsite for analysis. No benzene exceedances were detected.

Sorbents/filter fences for passive oil recovery

On Day 3, the Unified Command decided to extinguish the burning rail cars using aqueous film forming foam using industrial fire fighters. While moving a rail car, after the final fire watch, a pressure relief device on a ruptured rail car activated and a flash fire ignited. A second flash fire occurred 20 minutes later. All operations were ceased. Industrial fire fighters continued to cool rail cars and the rail bed for the remainder of the night. The source of ignition was never determined, but it was thought to be due to oil coming into contact with hot metal or ballast material. Due to possible re-ignition of the oil, industrial fire fighters remained on-scene until all oil was transferred from impacted rail cars.

Oil trapped within the wetland and in rail bed ballast continued to release after initial cleanup; crews returned and flushed the sediments and ballast in June 2014. Source: https://www.epaosc.org/site/site_profile.aspx?site_id=8939

Figure G-1. API Technical Report 425 (Options for Minimizing Environmental Impacts of Inland Spill Response): Rail Car Oil Spill Case Study

Name: Coffeyville Refinery	**Date**: 1 July 2007	**Oil Type Spilled**: Crude oil **Volume Spilled:** 2,145 bbl
Location: Coffeyville, Kansas		

Summary: Severe flooding in southeast Kansas caused the Verdigris River to overtop a levee surrounding Coffeyville, Kansas on July 1, 2007. Flood waters carried approximately 2,145 bbl of crude oil from Coffeyville Resources Refinery through the town of Coffeyville and southward into Oklahoma. Initial on-water containment and recovery operations quickly gave way to shoreline, wetland, and land cleanup as receding flood waters left oil stranded. Agency responders were USEPA Regions 6 and 7 and Kansas and Oklahoma environmental and health agencies. A comprehensive air, water, and soil sampling plan was implemented, and a "boil order" issued for water users in Coffeyville and down river.

Flood waters carrying crude oil from the refinery

Crude oil carried by flood waters through town

Approximately 400 buildings were impacted by oil. Coffeyville Resources implemented a voluntary purchase program for the majority of residential properties that were impacted by oil, for demolition and disposal. Buildings not demolished had to be cleaned and inspected to assure that no oil remained.

A Shoreline Cleanup Assessment Technique (SCAT) program was implemented to identify appropriate cleanup techniques and end points for shoreline, wetlands and rural land. Consistent representation was used on sign off teams once cleanup endpoint criteria had been met. Oil-stained vegetation in rural areas was left to naturally attenuate. Leaves stained with oil that died and dropped off were recovered as part of the cleanup. The SCAT process also documented the cleaning of storm drains, buildings, and structures. A combination of visual inspections consistent with the SCAT process and soil sample results were used to verify soil standards in rural areas and as part of the residential demolition. Many residential lots had to have the first several inches of soil removed due to high levels of VOCs.

The response was complicated due to multijurisdictional issues associated with two USEPA regions and two states. Demolition of structures fell under National Emissions Standards for Hazardous Air Pollutants, which regulates the management of asbestos-containing materials (ACM). Structures had to be inspected and an accredited ACM contractor had to be used to remove and dispose of ACM prior to demolition. Handling and disposal of household hazardous waste, electronic waste, and putrescible waste associated with dwellings, restaurants, grocery stores, liquor stores, automobiles, and tires all required additional oversight. The majority of the cleanup operations were complete within 6 months, with the completion of demolition and land restoration program taking one year.

Figure G-2. API Technical Report 425 (Options for Minimizing Environmental Impacts of Inland Spill Response): Severe Flooding Oil Spill Case Study

Name: Poudre Tank Spill	**Date**: 20 June 2014	**Oil Type Spilled**: Crude oil **Volume Spilled:** 178 bbl
Location: Weld County, Colorado		

Summary: The spill resulted when flood waters along Cache la Poudre River slightly dislodged one of the storage tanks at an oil production site, which resulted in failure of a fitting on a valve at the base of the tank. Most of the oil that was reported lost appeared to have discharged to the river during the flood. When floodwaters receded, oil was found at the site and along a path to the river.

Sorbents where placed at the point of discharge as a precaution. The remaining product in the tank and observable free product between the tanks and on the river were removed using a vacuum truck. Sorbent pads were aggressively applied to collect any remaining liquid oil and a surface washing agent was used to remediate impacted soils.

Affected soils and vegetation that were left to recover naturally

The production tanks were removed and the most highly impacted soil from around the tanks was excavated. Due to damage that excavation would cause to vegetation between the tanks and the river, the impacted locations in that area were left to recover naturally. Source: https://www.epaosc.org/site/site_profile.aspx?site_id=9335

Excavating oiled soils beneath the tanks

Sorbents used to recover free product

Figure G-3. API Technical Report 425 (Options for Minimizing Environmental Impacts of Inland Spill Response): Oil Production Storage Site Spill Case Study

APPENDIX H ROLE DESCRIPTIONS

Contents:

Section 5, Response Management Organization, describes the Tier 1 Onsite Response Team (ORT) and the Tier 2 and Tier 3 Incident Management Team (IMT) organisations. The size of the response team will depend on the magnitude and/or complexity of the incident and can be expanded or contracted as necessary. The response organisation gains progressively more positions as the magnitude of the required response increases. An actual response organisation will be event specific, and typically expands from the ORT to include a command staff (members of unified command and officers) and a general staff. All personnel assigned to either the command or general staff have a set of responsibilities that they should review and address as appropriate to the response.

This Appendix outlines the roles and responsibilities for the IMT response organisation personnel, with additional guidance for coordinating actions during the response and identifying and meeting response objectives. By reading the job aids, common responsibilities, positions descriptions and checklists, the responders will be guided in their duties within the incident command process.

Only positions that are required for an adequate response need to be filled, and the organisation should be kept as small as possible to accomplish the response objectives and monitor progress.

A single person may be assigned to more than one position and should review the role descriptions and checklists for all of the positions to which they are assigned or responsible.

H-1. Incident Objectives

Incident objectives

What you plan to do in order of priority.

Incident or response objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed. Incident objectives must be achievable and measurable, yet flexible enough to allow for strategic and tactical alternatives.

Strategies

How you plan to accomplish the objectives.

Since there are common priorities in any oil spill response, the following examples of typical objectives and strategies may be a helpful guide:

- Typical Objective: **Ensure the Safety of Citizens and Response Personnel**

Example Strategies:

- Identify hazard(s) of spilled material
- Establish site control (hot zone, warm zone, cold zone, and security)
- Consider evacuations, as needed
- Establish vessel and/or aircraft restrictions
- Monitor air in impacted areas
- Develop site safety and health plan for response personnel
- Ensure safety briefings are conducted

- Typical Objective: **Control the Source of the Spill**

Example Strategies:

- Complete emergency shutdown
- Conduct fire fighting
- Initiate temporary repairs
- Transfer and/or lighter product
- Conduct salvage operations, as necessary

- Typical Objective: **Manage Coordinated Response Effort**

Example Strategies:

- Complete or confirm notifications
- Establish a unified command organisation and facilities (command post, etc.)
- Ensure local officials are included in response organisation
- Initiate spill response Incident Action Plans (IAP)
- Ensure mobilisation and tracking of response resources
- Account for personnel and equipment

- Complete documentation
- Evaluate planned response objectives vs. actual response (debrief)

- Typical Objective: **Maximise Protection of Environmentally-Sensitive Areas**

Example Strategies:

- Implement pre-designated response strategies
- Identify resources at risk in spill vicinity
- Track oil movement and develop spill trajectories
- Conduct visual assessments (e.g., over flights)
- Develop/implement appropriate protection tactics

- Typical Objective: **Contain and Recover Spilled Material**

Example Strategies:

- Establish containment at the spill source
- Construct containment and/or deploy containment boom at appropriate collection areas
- Conduct oil removal through vacuum, pumps, and/or on-water skimming
- Evaluate time-sensitive response technologies (e.g., *in-situ* burning)
- Develop disposal plan

- Typical Objective: **Recover and Rehabilitate Injured Wildlife**

Example Strategies:

- Establish oiled wildlife reporting hotline
- Conduct injured wildlife search and rescue operations
- Setup primary care unit for injured wildlife
- Operate wildlife rehabilitation centre
- Initiate citizen volunteer effort for oiled bird rehabilitation

- Typical Objective: **Remove Oil from Impacted Areas**

Example Strategies:

- Conduct appropriate clean-up efforts
- Clean oiled structures (roads, drainages, etc.)
- Conduct decontamination program
- Develop disposal plan

- Typical Objective: **Minimise Economic Impacts**

Example Strategies:

- Consider tourism and local economic impacts throughout response
- Protect public and private assets, as resources permit
- Establish damage claims process

- Typical Objective: **Keep Stakeholders Informed of Response Activities**

Example Strategies:

- Provide forum to obtain stakeholder input and concerns
- Provide stakeholders with details of response actions
- Identify stakeholder concerns and issues, and address as practical
- Provide local officials with details of response actions

- Typical Objective: **Keep the Public Informed of Response Activities**

Example Strategies:

- Provide timely safety announcements
- Establish a Joint Information Centre (JIC) to manage information flow
- Conduct regular news briefings
- Manage news media access to spill response activities
- Conduct public meetings, as appropriate

H-2. Common Responsibilities

☑ **The following responsibilities apply to all personnel:**

- ❑ Receive assignment, notification, reporting location, reporting time, and travel instructions from your supervisor.
- ❑ Upon arrival at the incident, report to your designated check-in location. Check-in locations may be found at:
  - National Emergency Operations Centre
  - Incident Command Post,
  - Base or Camps, Staging Areas, Helibases,
  - Division Supervisors (for direct line assignments).
- ❑ Agency representatives from assisting or cooperating agencies report to Liaison Officer at the Command Post after checking in.
- ❑ All radio communications to Incident Communications Centre will be addressed: "(Incident Name) Communications".
- ❑ Use clear text and established Incident Command terminology (no codes) in all radio transmissions.
- ❑ Receive briefing from your immediate supervisor.
- ❑ Acquire work materials.
- ❑ Organise, assign, and brief subordinates, if applicable.
- ❑ Complete forms and reports required of the assigned position and send material directly or through your supervisor to the Documentation Unit.
- ❑ Document all activities and keep a personal activity log for the duration of the incident.
- ❑ Ensure continuity using in/out briefings.
- ❑ Respond to demobilisation orders. Brief subordinates regarding demobilisation, if applicable.

Section Chief and Unit Leader Responsibilities

☑ **Common responsibilities that must be accomplished by all Unit Leaders include (these responsibilities are not repeated in each Unit listing):**

- ❑ Participate in incident planning meetings, as required.
- ❑ Determine current status of unit activities.
- ❑ Confirm dispatch and estimated time of arrival of staff and supplies.
- ❑ Assign specific duties to staff; supervise staff.
- ❑ Determine resource needs.
- ❑ Develop and implement accountability, safety, and security measures for personnel and resources.
- ❑ Supervise demobilisation of unit, including storage and restocking of supplies.
- ❑ Provide Supply Unit Leader with a list of supplies to be replenished.

- ❑ Maintain unit records, including a Unit/Activity Log (ICS 214).

H-3. Roles and Responsibilities

Each of the Command Staff, Section Chiefs, Unit Leaders and Supervisors within the IMT have a set of responsibilities that they will review and address as appropriate to the response. Checklists provided in this section will assist these individuals in meeting the responsibilities corresponding to their roles. Roles will be added to the Response Team Organisation as the magnitude and complexity of the response increases.

Note that one person may be assigned to fulfil more than one role. In cases where an individual is assigned to more than one role, they should review the checklists for each role.

H-4. Command Section

If an IMT is required, the Command function generates objectives, determines response priorities to be addressed in the site of the spill by an ORT, and ensures that emergency response operations are carried out in a safe and effective fashion. The Command section is staffed by the Incident Commander (IC) or by a Unified Command (UC), and expert advisors called Officers (e.g., Safety Office, Legal Officer, Liaison Officer, Communications Officer).

UNIFIED COMMAND

Unified Command Goals

- ❑ Improve information flow between agencies
- ❑ A single, collective approach to the incident regardless of functional/geographic issues
- ❑ Optimize agency efforts by functioning as a team
- ❑ Reduce or eliminate duplicated effort

Unified Command Principles

- ❑ One Emergency Operations Centre (EOC) for the National-IMT or one Incident Command Post (ICP) for a local-IMT
- ❑ One IMT organization
- ❑ One Section Chief per section
- ❑ One planning process
- ❑ One resource ordering process

Considerations for Using Unified Command

- ❑ Kind or size of incident
- ❑ Kinds of agencies involved
- ❑ Number of agencies (or County Government entities) with jurisdiction involved
- ❑ Pre-established agreements

Unified Commanders' Role and Responsibilities

- ❑ See Incident Commander Checklist

INCIDENT COMMANDER *(Command Section)*

- ❑ The Incident Commander assumes overall responsibility for the management of the response operation, and will be responsible for coordinating the activities of all technical, logistics, administrative, finance and operations personnel.
- ❑ Review common responsibilities (Section H.2).
- ❑ Assess the situation and/or obtain a briefing from the prior Incident Commander and appropriate initial responders.
- ❑ Determine incident objectives, develop response strategies to meet the objectives (See examples, Section H.1), and establish the immediate priorities.
- ❑ Establish an appropriate incident response organisation (call out and assign roles).
- ❑ Establish an Emergency Operations Centre (EOC) for the National-IMT or an Incident Command Post (ICP) for a local-IMT, as appropriate.
- ❑ Ensure proper notification to IMT, contractors, government agencies, natural resource trustees(s), and affected communities.
- ❑ Brief Command Staff and Section Chiefs on the incident size and complexity upon arrival.
- ❑ Approve and authorise implementation of an Incident Action Plan.
- ❑ Ensure that adequate safety measures are in place.
- ❑ Ensure status and planning meetings are scheduled as required.
- ❑ Determine information needs and advise Command and General Staff.
- ❑ Coordinate activity for all Command and General Staff.
- ❑ Coordinate with key officials and stakeholders through the Liaison Officer.
- ❑ Approve requests for additional resources or for the release of resources.
- ❑ Communicate with the Deputy Incident Commander (if assigned), Command & General Staff, and appropriate technical advisors.
- ❑ Meet with Operations and Planning Section Chiefs to determine acceptable levels of response and environmental clean-up.
- ❑ Review site inspection reports to make sure objectives are being accomplished.
- ❑ Evaluate and adjust response priorities.
- ❑ Keep agency or authorising entity informed about incident status.
- ❑ Approve, if appropriate, the use of trainees, volunteers, or auxiliary personnel.
- ❑ Authorise release of information through the Information Officer.
- ❑ Ensure incident funding is available.
- ❑ Coordinate incident investigation responsibilities.
- ❑ Seek appropriate legal counsel.
- ❑ Order the demobilisation of incident resources, when appropriate.

DEPUTY INCIDENT COMMANDER *(Command Section)*

The Incident Commander may assign a deputy. The Deputy Incident Commander will coordinate and supervise the response operations. He/she will communicate on behalf of the Incident Commander with all response personnel and serve as the link between the Incident Commander and the response personnel. He/she will assume the role of Incident Commander in situations when the Incident Commander cannot continue to serve for any reason, and has complete authority over response personnel at the spill scene as directed by, or in the absence of, the Incident Commander.

- ❑ Review common responsibilities (Section H.2).
- ❑ Attend all of the Incident Commander's planning meetings.
- ❑ Ensure all required response roles are filled and establish shift changes for the IMT.
- ❑ Coordinate and implement the response activities.
- ❑ Meet/communicate with the Command Staff and General Staff to establish lines of communication between each section.
- ❑ Hold planning meeting with the Command Staff and General Staff.
- ❑ Ensure that response operations are closely monitored.
- ❑ Identify ways to improve the effectiveness of the response operations and propose alternatives for improvements.
- ❑ Provide the Incident Commander and the Information Officer with accurate and up-to-date information on the status of response operations.
- ❑ Ensure that the safety of response personnel is accorded the highest priority in all aspects and phases of response operations.
- ❑ Ensure that the response personnel have the equipment, materials, and supplies needed to carry out their duties in a safe, effective, and efficient fashion.
- ❑ Stand in for the Incident Commander when needed.
- ❑ Coordinate with the Liaison Officer on the preparation of all reports, plans, and other materials prepared for submission to government agencies.
- ❑ Resolve internal conflicts that may arise within the response operations.
- ❑ Work with the Incident Commander, Information Officer, and Liaison Officer to ensure that personnel are aware of, and follow, appropriate government agency directives and laws.
- ❑ Authorize procurement/leasing of necessary equipment, manpower, and services.
- ❑ Work with the Legal Officer and appropriate managers to ensure that appropriate documentation is compiled. Communicate with the Legal Officer on the type of documentation needed to support potential incident-related litigation.
- ❑ Supervise preparation of and implement a Mobilisation and Demobilisation Plan.
- ❑ Work with the Compensation Unit to establish a claims program and to obtain documentation for filing claims.

PUBLIC INFORMATION OFFICER *(Command Section)*

The Public Information Officer (PIO) is responsible for developing and releasing information about the incident to the news media, to incident personnel, special interest groups, and to other appropriate agencies and organisations. This includes development of necessary distribution literature, scheduling of all news conferences and public meetings, and acting as chief facilitator and spokesperson during these events. He/she handles all public affairs matters with the Incident Commander and the Deputy Incident Commander, and works with Unified Command representatives in the formulation of a Joint Information Centre (JIC). The Information Officer may have assistants, as necessary.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Determine from the Incident Commander if there are any limits on information release.
- ❑ Establish media guidelines for Response Team members. Conduct public relations workshops for the IMT and volunteers, if necessary.
- ❑ Develop material for use in news briefings, and prepare draft press releases.
- ❑ Obtain Incident Commander's approval for news media releases.
- ❑ Inform news media, coordinate and conduct news/press briefings.
- ❑ Arrange for tours and other interviews or briefings that may be required.
- ❑ Obtain news media information that may be useful for incident planning.
- ❑ Maintain current information summaries and/or displays on the incident.
- ❑ Provide information on status of incident to assigned personnel.
- ❑ Establish and staff a Joint Information Centre (JIC) to manage and control information flow, as necessary.
- ❑ Be available to handle on-the-spot inquiries from the media (e.g. approaches from journalists to personnel on the beach).
- ❑ Monitor and review media coverage of the incident.
- ❑ Document all activities to include a record of every inquiry noting the source, time, and nature of information sought.

SAFETY OFFICER (Command Section)

The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures to assure personnel safety. This includes establishing, maintaining, and providing for emergency medical services, and developing a Site Safety and Health Plan. The Safety Officer maintains awareness of active and developing situations, and includes appropriate safety messages in each Incident Action Plan. He/she advises the Operations Chief and the Deputy Incident Commander on proper safety and health practices and monitors compliance with industrial hygiene regulations. The Safety Officer should be well versed in safe operation practices as well as have a basic knowledge of first aid.

The Safety Officer will correct unsafe acts or conditions through the regular line of authority, although the Safety Officer may exercise emergency authority to prevent or stop unsafe acts when immediate action is required.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ During initial response, perform a site characterisation (see Section 2.3.2), and document the hazard analysis process addressing hazard identification, personal protective equipment, control zones, and decontamination area.
- ❑ Have the SDS readily available for site safety briefings and the safety plans developed at the time of incident response.
- ❑ Participate in planning meetings to identify any health and safety concerns inherent in the operations daily work plan.
- ❑ Review the Incident Action Plan for safety implications.
- ❑ Exercise emergency authority to prevent or stop unsafe acts.
- ❑ Investigate, report, and document accidents and injuries that have occurred within incident areas.
- ❑ Ensure preparation and implementation of Site Safety and Health Plan (SSHP) in accordance with regulations. The Safety Officer may use the Site Safety Plan Checklist as a guide to facilitate development of a written site safety and health plan The SSHP shall, at a minimum, address, include, or contain the following elements:
  - Health and safety hazard analysis for each site task or operation.
  - Comprehensive operations work plan.
  - Personnel training requirements.
  - PPE selection criteria.
  - Site-specific occupational medical monitoring requirements.
  - Air monitoring plan: area/personal.
  - Site control measures.
  - Confined space entry procedures "only if needed".
  - Pre-entry briefings (tailgate meetings): initial and as needed.
  - Pre-operations health and safety conference for all incident participants.
  - Quality assurance of SSHP effectiveness.
- ❑ Assure that clean-up workers are properly trained in safety and health matters.

- ❑ Monitor effectiveness of instruction and training facilities implemented.
- ❑ Post safety messages at all work sites.
- ❑ Ensure all Response Teams hold routine safety meetings/briefings.
- ❑ Assign assistants, as necessary, and manage the incident safety organisation.
- ❑ Establish first aid posts. Compile list of first aid and safety equipment needed for site operation.
- ❑ Establish contact with local emergency/medical services and request help, as needed.
- ❑ Review and approve the Medical Plan (ICS 206).
- ❑ Attend induction/debriefing of contractors.

LIAISON OFFICER (*Command Section)*

The Liaison Officer is the point of contact for the assisting and cooperating agency representatives and stakeholder groups. He/she is responsible for advising the Incident Commander on liaison with the various government agencies involved and ensures that relevant regulations are being followed and permits are being obtained. He/she assures that company operations are not at variance with efforts or programs of the various government and local agencies involved.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Ensure that all appropriate regulatory bodies have been notified of spill.
- ❑ Provide a point of contact for assisting and cooperating agency representatives, civic representatives, and stakeholders.
- ❑ Identify agency representatives from each agency, including communications link and location.
- ❑ Maintain a list of assisting and cooperating agency and stakeholder group contacts.
- ❑ Assist in establishing and coordinating interagency contacts.
- ❑ Keep agencies supporting the incident aware of incident status.
- ❑ Advise Incident Commander on government issues/programs.
- ❑ Monitor incident operations to identify current or potential inter-organisational issues and advise Incident Command, as appropriate.
- ❑ Work with government agencies and stakeholders to expedite response options.
- ❑ Ensure government agencies and stakeholders are in agreement with response strategy.
- ❑ Participate in planning meetings, provide current resource status information, including limitations and capabilities of assisting agency resources.
- ❑ Inform appropriate team members, including the Incident Commander and the Deputy Incident Commander, of government agencies' responses where these may require modifications to the Incident Action Plan.
- ❑ Seek approval and required permits from appropriate government agencies for proposed response actions. Submit permit applications and seek waivers, as appropriate.
- ❑ Monitor all operations subject to government agency regulations to ensure compliance with statutory requirements and permits. Advise the Operations Chief of permits needed for response operations.
- ❑ Provide information and support to local government officials and stakeholder groups.
- ❑ Conduct observation tours for government agency representatives and stakeholders, as required.

LEGAL OFFICER (*Command Section)*

The Legal Officer acts in an advisory capacity during an oil spill response.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Participate in planning meetings, if requested.
- ❑ Assist in press and information release preparation, if requested.
- ❑ Evaluate National laws and regulations relevant to the response activities.
- ❑ Advise on legal issues relating to *in-situ* burning, dispersants, and other response technologies.
- ❑ Advise on legal issues relating to impact assessment.
- ❑ Advise on legal issues relating to investigation.
- ❑ Advise on legal issues relating to finance and claims.
- ❑ Advise on contractual arrangements for provision of equipment and personnel.
- ❑ Advise on response related legal issues and implications of proposed plans of action.
- ❑ Advise on arrangements with local authorities or other interested parties for dealing with a spill.

H-5. Operations Section

All incidents begin with an ORT activating a pre-established OSCP at the site of the spill. If a robust IMT (moderate or major incidents) is required, the Operation function provides strategic direction to the ORT. The Operations function is responsible for keeping the rest of the IMT informed about the nature and status of the ORT(s) response operations and its/their needs.

Operations Section Branches

Some considerations dividing the functions of the operations section include:

- **Multijurisdictional Incidents**
  Some incident may benefit from organizing the response operations around jurisdictional lines. In these situations, Branches may be set up to reflect jurisdictional boundaries.
- **Large Major Incidents**
  Large incidents may require using geographic or functional Branches or both. For example, National Security and Source Control Branches could include large specialized organizations working in multiple locations for each Branch.
- **Multidiscipline Incidents**
  Examples where multiple disciples required separate direction may include Source Control Branch, On-Water Recovery Branch, Near-Shore Branch, Damage Control, Salvage, Wildlife Branch, or Recovery Branch, etc.

Operations Section Management

Management elements to manage the Operations Section responsibilities (Appendix H) include the following.

- **Staging Area**
  Staging areas are locations where incident personnel and equipment are assigned (ready for deployment) awaiting tactical assignment. Each Staging Area is managed by a Staging Area Manager.
- **Divisions**
  Divisions is a classification of geographical areas where response operations are being conducted or planning to be conducted. The benefits of a Divisional Organization allow resources a clearly assigned location and can be found easily on a chart or map. The Operation Section Chief in coordination with the SCAT Coordinator will set boundaries and name Divisions of operations. A standardized practice in Kenya for naming divisions, include:
  - Name the incident/source location Division A.
  - MaOnshore divisions are named with a single alpha character B to Z a three-letter regional identifier City or County. For example, MOM-B for Division B in the Mombasa County.
  - Island divisions are named with double alpha characters BB to ZZ proceeded by a three-letter island code. For example, the convention would be LAM – BB for Division B on Lamu Island.

OPERATIONS SECTION CHIEF *(Operations Section)*

The Operations Section Chief is responsible for managing all operations directly applicable to the primary mission. The Operations Section Chief activates and supervises elements in accordance with the Incident Action Plan and directs its execution; activates and executes the Site Safety and Health Plan; directs the preparation of unit operational plans; requests or releases resources; makes expedient changes to the Incident Action Plans as necessary; and reports such to the Incident Commander. The Operations Section Chief is responsible for all field operations and delegates responsibility to a number of Field Supervisors.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Conducting an initial assessment.
- ❑ Develop tactical response actions to gain and maintain control of the spill situation.
- ❑ Organize field crews and identify geographic area or functions assigned to the crews. Establish staging areas.
- ❑ Attend planning meetings and develop Operations portion of Incident Action Plan.
- ❑ Assign and brief Operations personnel in accordance with approved Incident Action Plan.
- ❑ Hold planning meeting with the Field Supervisor(s) and other appropriate personnel. Assign specific work tasks to Field Supervisors and crews.
- ❑ Supervise and coordinate the implementation of the agreed response strategies (execution of the Incident Action Plan for Operations).
- ❑ Request resources needed to implement Operation's tactics as part of the Incident Action Plan development (ICS 215).
- ❑ Ensure safe tactical operations.
- ❑ Work with the Liaison Officer on obtaining the necessary permits and approvals for the response operations.
- ❑ Make, or approve, expedient changes to the Incident Action Plan during the operational period, as necessary.
- ❑ Maintain regular contact with the Field Supervisor(s) and the Incident Commander.
- ❑ Monitor effectiveness of containment, clean-up and disposal operations with the Planning Section Chief; advise the Incident Commander on necessary modifications.
- ❑ Assist the Field Supervisor(s) in assuring that prescribed clean-up standards have been achieved.
- ❑ Approve suggested list of resources to be released from assigned status (not released from the incident).
- ❑ Assemble and disassemble crews/task forces assigned to Operations Section.
- ❑ Report information about changes in the implementation of the IAP, special activities, events, and occurrences to Incident Commander.

FIELD SUPERVISOR (Operations Section)

Under the Operations Section Chief, the Field Supervisor directs the field and vessel crews in performing various spill response operational assignments. The Supervisor communicates frequently with the Operations Section Chief (or immediate supervisor) on the progress of various response operations in the field so that they can inform the Incident Commander of any changes in operations necessary to improve the spill response tasks. The Supervisor reports work progress, resource status and other important information, and maintains work records on assigned personnel.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Attend planning meetings at the request of the Operations Section Chief.
- ❑ Coordinate with the Operations Section Chief to identify the location or functions assigned and proceed to set up the field operation sites.
- ❑ Activate a plan for deploying equipment and personnel from staging areas.
- ❑ Review assignments and incident activities with subordinates and assign tasks.
- ❑ Report to Operations Section Chief when: Incident Action Plan needs to be modified, additional resources are needed, surplus resources are available, there are problems with assigned resources, hazardous situations or significant events occur.
- ❑ Monitor effectiveness of operations and procedures/equipment employed; make recommendations to the Operations Section Chief, as appropriate.
- ❑ Determine the need for assistance on assigned tasks and request needed resources.
- ❑ Resolve logistical problems in the field.
- ❑ Coordinate activities with other Field Crews and Units.
- ❑ Maintain regular radio communications with other Field Supervisors, Staging Area Managers, and Operations Section Chief.
- ❑ Summarize field information from response personnel and submit situation and resource status information to the Operations Section Chief.
- ❑ Hold planning meetings with the field crews.
- ❑ Prepare report summarising daily activities. Submit situation and resources status information to Operations Section Chief.
- ❑ Arrange for equipment maintenance with Staging Area Manager.
- ❑ Rotate contractors and personnel to prevent fatigue.
- ❑ Report problems, special occurrences or events such as accidents or illness to the Operations Section Chief and/or Safety Officer.

STAGING AREA MANAGER (*Operations Section)*

Under the Operations Section Chief, the Staging Area Manager is responsible for managing all activities within the designated staging areas.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Implement pertinent sections of the Incident Action Plan.
- ❑ Establish and maintain boundaries of staging areas.
- ❑ Post signs for identification and traffic control.
- ❑ Establish check-in/check-out function for personnel and equipment, as appropriate.
- ❑ Determine and request logistical support for personnel and/or equipment, as needed.
- ❑ Advise Operations Section Chief of all changing situations and conditions on scene.
- ❑ Report to Operations Section Chief when: additional resources are requested, surplus resources are available, or there are problems with staged resources.
- ❑ Arrange for equipment maintenance and decontamination, as necessary.
- ❑ Respond to requests for resource assignments.
- ❑ Respond to requests for information, as required.
- ❑ Demobilise or reposition staging areas, as needed.

RECOVERY AND PROTECTION BRANCH DIRECTOR (*Operations Section)*

The Recovery and Protection Branch Director is responsible to oversee and implement the containment, protection, and clean-up activities established in the Incident Action Plan. The Recovery and Protection Branch Director reports to the Operations Section Chief. The Recovery and Protection Director makes frequent visits to the response operations area(s) to ensure that manpower and equipment are being properly utilized.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Participate in planning meetings, as required.
- ❑ Develop containment and recovery operations portion of Incident Action Plan.
- ❑ Brief and assign containment and recovery operations personnel in accordance with Incident Action Plan.
- ❑ Supervise operations.
- ❑ Determine resource needs.
- ❑ Review recommendations and initiate release of resources.
- ❑ Ensure labourers/workers are properly trained on equipment operation and safety.
- ❑ Direct the activities of all employees and contractors engaged in containment and recovery operation.
- ❑ Reassign equipment to areas where it will have greater effectiveness.
- ❑ Prepare daily summary which will include: protection and clean-up locations and amount of equipment deployed, amount of oil recovered, storage locations for recovered oil, problems encountered, and number of persons working. Submit weekly clean-up report to the Division/Group Supervisor or Operations Section Chief.
- ❑ Estimate level of effort for continued response operation.
- ❑ Consult with the Environmental Unit Leader to determine special requirements for environmentally sensitive areas.
- ❑ Stand down equipment/manpower as appropriate.
- ❑ Report information about special activities, events, and occurrences to Operations Section Chief.

ON-WATER RECOVERY UNIT LEADER *(Operations Section)*

The On-Water Recovery Unit Leader reports to the Recovery and Protection Branch Director, and is responsible for managing on-water recovery operations in compliance with the Incident Action Plan.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Implement recovery strategies in Incident Action Plan.
- ❑ Direct, coordinate, and assess effectiveness of on-water recovery actions.
- ❑ Modify recovery actions, as needed.
- ❑ Brief the Recovery and Protection Branch Director or immediate supervisor (e.g., Operations Section Chief) on activities.

SHORE-SIDE RECOVERY UNIT (*Operations Section)*

The Shore-side Recovery Unit Leader reports to the Recovery and Protection Branch Director, and is responsible for managing shore-side clean-up operations in compliance with the Incident Action Plan.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Implement recovery strategies in Incident Action Plan.
- ❑ Direct, coordinate, and assess effectiveness of shore-side clean-up actions.
- ❑ Modify recovery actions, as needed.
- ❑ Brief the Recovery and Protection Branch Director or immediate supervisor (e.g., Operations Section Chief) on activities.

AIR OPERATIONS BRANCH MANAGER (*Operations Section)*

The Air Operations Branch Manager, who is ground-based, is primarily responsible for preparing the air operations portion of the Incident Action Plan. The Incident Action Plan will reflect agency restrictions such as night flying or hours per pilot that impact the operational capability or use of resources. After the Incident Action Plan is approved, Air Operations is responsible for implementing its strategic aspects (those that relate to the overall incident strategy as opposed to those that pertain to tactical operations like specific target selection). Additionally, the Air Operations Branch Manager is responsible for providing logistical support to helicopters assigned to the incident.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Organize preliminary air operations.
- ❑ Request declaration or cancellation of restricted air space area.
- ❑ Participate in planning meetings, as required.
- ❑ Participate in preparing the Incident Action Plan.
- ❑ Perform operational planning for air operations.
- ❑ Prepare and provide Air Operations Summary Worksheet to the Air Support Group and Fixed-Wing Bases.
- ❑ Coordinate with appropriate Operations Section personnel and activities.
- ❑ Supervise all air operations activities associated with the incident (ICS 220).
- ❑ Establish procedures for emergency reassignment of aircraft.
- ❑ Schedule approved flights of non-incident aircraft in the restricted air space area.
- ❑ Resolve conflicts concerning non-incident aircraft.
- ❑ Coordinate with Kenya Defence Force and/or commercial companies.
- ❑ Update air operations plans.
- ❑ Report to the Logistics Section Chief on air operations activities.
- ❑ Arrange for an accident investigation team, when warranted.

Tactical Air Support

- ❑ Determine what aircraft (fixed-wing and helicopters) are operating within the area of assignments.
- ❑ Manage air tactical activities based upon the Incident Action Plan.
- ❑ Coordinate approved flights of non-incident aircraft or non-tactical flights in restricted air space area.
- ❑ Coordinate dispersant and *in-situ* burning application through the Dispersants and/or *In-Situ* Burn Operations Supervisors (Operations).
- ❑ Obtain information about air traffic external to the incident.
- ❑ Receive reports of restricted air space violations.

- ❑ Coordinate air surveillance mission scheduling and observer assignments with the Situation Unit Leader.
- ❑ Identify remote sensing technology that may enhance surveillance capabilities.
- ❑ Coordinate air surveillance observations and provide reports by the most direct methods available.
- ❑ Report air surveillance and operations activities to Operations Section Chief.
- ❑ Coordinate application monitoring requirements with the Situation Unit.
- ❑ Report on air application activities to the Operations Section Chief.
- ❑ Report on incidents/accidents.

Strategic Air Support

- ❑ Obtain copy of the Incident Action Plan including the Air Operations Summary Worksheet.
- ❑ Identify resources/supplies dispatched for air Support group.
- ❑ Request special air support items from appropriate sources through Logistics Section.
- ❑ Identify helibase and helispot locations from the Incident Action Plan or from the Air Operations Director.
- ❑ Determine need for personnel and equipment assignments at each helibase or helispot.
- ❑ Coordinate special requests for air logistics.
- ❑ Maintain coordination with air bases supporting the Incident.
- ❑ Obtain assigned ground to air frequency for Air operations from Communication Unit Leader or Communications Plan.
- ❑ Inform Operations Section of capability to provide night-flying service.
- ❑ Ensure compliance with each agency's operations checklist for day and night operations.
- ❑ Ensure dust abatement procedures are implemented at helibase and helispots.
- ❑ Provide crash-rescue service for helibases and helispots.
- ❑ Ensure that Air Traffic Control procedures are established.

WILDLIFE BRANCH DIRECTOR (*Operations Section)*

The Wildlife Branch Director is responsible for minimising wildlife losses during spill responses; coordinating early aerial and ground reconnaissance of wildlife at the spill site, and reporting results to the Situation Unit Leader; employing wildlife hazing measures as authorised in the Incident Action Plan; and recovering and rehabilitating impacted wildlife.

A central wildlife processing centre should be identified and maintained for: evidence tagging, transportation, veterinary services, treatment and rehabilitation, storage, and other support needs. The activities of private wildlife care groups will be overseen and coordinated by the Wildlife Branch Director.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Develop Wildlife Branch portion of the Incident Action Plan.
- ❑ Coordinate with Planning (Situation Unit) in conducting aerial and group surveys of wildlife in the vicinity of the spill.
- ❑ Supervise Wildlife Rescue operations.
- ❑ Determine resource needs.
- ❑ Review suggested list of resources to be released and initiate recommendation for release of resources.
- ❑ Assemble and disassemble Strike Teams/Task Forces assigned to the Wildlife Branch.
- ❑ Deploy acoustic and visual wildlife hazing equipment, as needed.
- ❑ Establish and implement protocols for collection and logging of impacted wildlife.
- ❑ Coordinate transportation of wildlife to processing station(s).
- ❑ Report information about special activities, events, and occurrences to Operations Section Chief.

WILDLIFE REHABILITATION CENTRE MANAGER

The Wildlife Rehabilitation Centre Manager is responsible for receiving oiled wildlife at the processing centre, recording essential information, collecting necessary samples, and conducting triage, stabilization, treatment, transport, and rehabilitation of oiled wildlife. The manager is responsible for assuring proper wildlife transportation to appropriate treatment centres for oiled animals requiring extended care and treatment.

- ❑ Determine resource needs and establish processing station for impacted wildlife.
- ❑ Process impacted wildlife and maintain logs.
- ❑ Collect numbers/types/status of impacted wildlife and brief the Wildlife Branch director or supervisor.
- ❑ Coordinate transport of wildlife to other facilities.
- ❑ Coordinate release of recovered wildlife.
- ❑ Implement demobilisation plan.

- ❑ Brief the Wildlife Branch Director or supervisor on activities.

DISPOSAL/WASTE MANAGEMENT UNIT (*Operations Section)*

The Disposal/Waste Management Unit Leader makes frequent visits to the clean-up area to ensure that manpower and equipment are being properly utilized. He/she has responsibility for supervising the disposal of all recovered waste from response operations. He/she ensures that the disposal of oily and non-oily wastes is in accordance with the recommendations of the Environmental Unit.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Prepare a detailed, strategic plan for waste management.
- ❑ Advise on the most cost-effective ways to hold large quantities of recovered oil and debris while awaiting its proper disposal.
- ❑ Work with the Planning Section Chief and the Operations Section Chief to estimate storage capacity for recovered oil and oiled debris.
- ❑ Contact power plant s, terminals, etc., in the region to see if they have the capacity to dispose, temporarily store, or reclaim recovered oil.
- ❑ Identify regional waste disposal facilities and determine procedures for waste acceptance.
- ❑ Consult local and National hazardous waste laws and regulations for waste storage, transportation, and disposal requirements.
- ❑ Obtain local authority approval of plan, via the Liaison Officer.
- ❑ Work with the Environmental Unit and the Liaison Officer to obtain the necessary permits.
- ❑ Contact tug/barge companies and request barges for recovered oil storage, as required.
- ❑ Coordinate with Logistics for manpower, equipment, and services necessary to execute waste disposal/storage plan. Identify and obtain equipment for recovered oil storage.
- ❑ With the Finance Section, arrange all contracts with waste disposal contractors to dispose of all the waste material.
- ❑ Execute the waste disposal plan.
- ❑ Arrange waste disposal sites with local authorities for recovered oil and oiled debris, and determine procedures and conditions to be followed.
- ❑ Work with Operations Section Chief to identify shore-side staging areas for recovered oil and debris storage.
- ❑ Utilize, as much as possible, predetermined disposal sites, both temporary and permanent.
- ❑ Supervise activities of waste disposal contractors.
- ❑ Coordinate with the Logistics to obtain all transportation not supplied by contractor that is required for the hauling of waste material (e.g. tank trucks).
- ❑ Ensure oily and non-oily wastes are segregated.
- ❑ Ensure response operations are done in a way to minimize waste generation.
- ❑ Advise the Operations Section Chief of the quantity of the recovered oil on hand that can be recycled.

- ❑ Monitor effectiveness of disposal and sampling operations. Re-assign equipment to areas where it will have greater effectiveness.
- ❑ Monitor recovered oil and waste handling activities to make sure that regulatory requirements are satisfied.
- ❑ Conduct safety inspections.
- ❑ Approve contractor time sheets and receipts for equipment used.
- ❑ Stand down equipment/manpower, as appropriate.
- ❑ Calculate and verify the volume of petroleum recovered, including petroleum collected with sediments/sand, etc.
- ❑ Maintain accurate logs to document: quantity and types of materials recovered and stored, storage locations for recovered materials and disposal sites used for recovered materials.
- ❑ Issue a final status report.

H-6. Planning Section

The Planning Section takes the lead in the conduct of short term (e.g., preparation of Incident Actin Plans or IAPs) and long term (e.g., preparation of a General Plan, assess the incident severity potential) planning. In addition, the planning function manages information (by establishing and maintaining an information centre with status boards, and collecting and preserving documentation) needed by the entire IMT in the transition from a reactive mode into a proactive approach to response operations. The planning section also provides the specialized technical expertise required to engage the IMT in a continual improvement process.

Once the National-IMT gets stablished, the Planning Section will guide the IC/UC, Officers, Section Chiefs, and the Environmental Unit Leader to assess the incident severity potential, as quickly as possible, in order to determine:

- ❑ How many people will be needed to carry out emergency response operations
- ❑ If there are missing personnel, what their condition might be when they are found
- ❑ Whether hazards present at the incident scene are likely to grow in intensity
- ❑ Whether the IMT has the ability to provide adequate medical assistance to those injured by the incident and/or during the conduct of emergency response operations
- ❑ How long it will take to bring the source of the incident under control
- ❑ How long it will take to contain spilled oil and how far will it spread prior to containment
- ❑ Identify environmental, cultural, and/or economic resources at risk
- ❑ Whether there is a high level of interest by government officials, the public, and other stakeholders

PLANNING SECTION CHIEF (*Planning Section)*

The Planning Section becomes the organizational focus for all information or intelligence relative to the incident. The Planning Section Chief, a member of the General Staff, is responsible for collecting, evaluating, disseminating, and using information about the incident and status of resources. This element is responsible for maintaining and understanding current situations status, as well as attempting to predict probable future incident developments (for example, the use of computer modelling systems), and provide information to prepare alternative strategies for the incident.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Activate Planning Section units as applicable to the size and complexity of the incident.
- ❑ Assign available personnel already on site to ICS organizational positions, as appropriate.
- ❑ Collect and process information about the incident.
- ❑ Provide input to the Incident Command and Operations Sections Chief in preparing the Incident Action Plan.
- ❑ Provide information regarding response strategies and techniques that are most suitable for responding to the incident and recommend response priorities.
- ❑ Participate in planning and other meetings, as required.
- ❑ Establish information requirements and reporting schedules for all ICS organizational elements for use in preparing the Incident Action Plan.
- ❑ Determine need for any specialized resources in support of the incident.
- ❑ Provide Resources Unit with the Planning Section's organizational structure, including names and locations of assigned personnel.
- ❑ Assign Technical Specialists, where needed. Meet with and coordinate work of the Technical Advisors.
- ❑ Assemble information on alternative strategies.
- ❑ Assemble and disassemble Strike Teams or Task Forces in conjunction with the Operations Section Chief, as necessary.
- ❑ Provide periodic predictions on incident potential.
- ❑ Compile and display incident status summary information.
- ❑ Provide status reports to appropriate requesters.
- ❑ Advise General Staff of any significant changes in incident status.
- ❑ Incorporate the incident Traffic Plan (from Ground Support Unit), Vessel Routing Plan (from Vessel Support Unit) and other supporting plans in the Incident Action Plan.
- ❑ Instruct Planning Section Units in distribution and routing of incident information.
- ❑ Prepare resource release recommendations for submission to Incident Command.
- ❑ Maintain Section records.

RESOURCE UNIT (Planning Section)

The Resources Unit Leader is responsible for maintaining the status of all resources (primary and support) at an incident. The Resources Unit Leader achieves this by developing and maintaining a master list of all resources, including check-in, status, current location, etc. This unit is also responsible for preparing parts of the Incident Action Plan (ICS 203, 204 & 207) and compiling the entire plan in conjunction with other members of the ICS, (e.g., Situation Unit, Operations, Logistics) and determining the availability of resources.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing and special instructions from the Planning Section Chief.
- ❑ Participate in Planning Meetings, as required.
- ❑ Establish check-in function at incident locations.
- ❑ Using the Incident Briefing (ICS 201), prepare and maintain the Incident Situation Display (organization chart and resource allocation and deployment sections).
- ❑ Establish contacts with all incident facilities to track resource status.
- ❑ Coordinate through the Logistics Chief for manpower, equipment, and service (including hire of aircraft/ helicopters/boats/photographer) requirements.
- ❑ Gather, post, and maintain incident resource status.
- ❑ Maintain master roster of all resources checked in at the incident.
- ❑ Prepare Organization Assignment List (ICS 203) and Organization Chart (ICS 207).
- ❑ Prepare appropriate parts of Assignment Lists (ICS 204).
- ❑ Assist the Situation Unit to prepare the Incident Status Summary (ICS 209).
- ❑ Provide status reports to appropriate requesters.

SITUATION UNIT (*Planning Section)*

The Situation Unit Leader is responsible for collecting and evaluating information about the current, and possible future, status of the spill and the spill response operations. This responsibility includes compiling information regarding the type and amount of oil spilled, the amount of oil recovered, the current location and anticipated trajectory of the oil, and impacts on natural resources. This also includes providing information to the GIS Specialist(s) for mapping the current and possible future situation, and preparing reports for the Planning Section Chief.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing and special instructions from the Planning Section Chief.
- ❑ Participate in planning meetings, as required.
- ❑ Prepare and maintain Incident Situation Display and/or Common Operating Picture.
- ❑ Collect and maintain current incident data, including a current map of the oil slick.
- ❑ Obtain and regularly check and update local weather forecasts, meteorological and ocean data.
- ❑ Arrange for aerial survey of the area to obtain estimates on the slick size and movement.
- ❑ Prepare charts for oil spotters marked up with proposed search patterns. Brief oil spotters on aerial survey plan.
- ❑ Coordinate monitoring activities with government agencies via the Government Liaison Advisor.
- ❑ Obtain maps of the spill area via aerial survey results and plot spill trajectory.
- ❑ Prepare periodic predictions, as requested by the Planning Section Chief. Predict direction of spill movement and areas of impact based on 24-hour weather forecast using computer models or other, as appropriate.
- ❑ Advise the Planning Section Chief, the Deputy Incident Commander and the Operations Section Chief of coastal or downstream areas that are anticipated to be impacted within 24, 48 and 72 hours.
- ❑ Work with the Dispersant/Burning Technical Advisor to identify the appropriate areas for dispersant application and/or burning.
- ❑ Continue to conduct routine aerial observation of the spill site.
- ❑ Prepare, post, and disseminate resource and situation status information, as required in the Incident Information Centre.
- ❑ Prepare the Incident Status Summary (ICS 209).
- ❑ Provide status reports to appropriate requesters.
- ❑ Provide photographic services and maps.

DOCUMENTATION UNIT (*Planning Section)*

The Documentation Unit Leader is responsible for maintaining accurate, up-to-date incident files such as: Incident Action Plan, incident reports, communication logs, injury claims, situation status reports, etc. Thorough documentation is critical to post-incident analysis. Some of these documents may originate in other sections. This unit will ensure each section is maintaining and providing appropriate documents. Incident files will be stored for legal, analytical, and historical purposes. The Documentation Unit also provides duplication and copying services.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing and special instructions from Planning Section Chief.
- ❑ Participate in Planning Meetings, as required.
- ❑ Establish a filing system and organize incident files.
- ❑ Establish duplication service and respond to requests.
- ❑ File copies of all official forms and reports.
- ❑ Check on accuracy and completeness of records submitted for files and correct errors or omissions by contacting appropriate ICS units.
- ❑ Provide incident documentation to appropriate requesters.
- ❑ Maintain official log.
- ❑ Log and collect copies of photographs, field notebooks, team member notes and observations, purchase orders, contracts, work orders, unit logs, personal logs, and any other documentation pertaining to the incident.

ENVIRONMENTAL UNIT (*Planning Section)*

The Environmental Unit Leader is responsible for environmental matters associated with the response, including strategic assessment, modelling, surveillance, and environmental monitoring and permitting. The Environmental Unit prepares environmental data for the Situation Unit.

Technical Specialists frequently assigned to the Environmental Unit include the Scientific Support Coordinator and Specialists for Sampling, Response Technologies, Trajectory Analysis, Weather Forecasts, Resources at Risk, Shoreline Clean-up Assessment, Historical/Cultural Resources, and Disposal.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing and special instructions from Planning Section Chief.
- ❑ Participate in planning section meetings.
- ❑ Identify sensitive areas and recommend response priorities.
- ❑ Determine the extent, fate, and effects of contamination.
- ❑ Acquire, distribute, and provide analysis of weather forecasts.
- ❑ Monitor the environmental consequences of clean-up actions.
- ❑ Develop shoreline clean-up and assessment plans.
- ❑ Identify the need for, and prepare, any special advisories or orders.
- ❑ Identify the need for, and obtain, permits, consultations, and other authorizations.
- ❑ Identify and develop plans for protection of affected historical/cultural resources.
- ❑ Evaluate the opportunities to use various Response Technologies.
- ❑ Develop disposal plans.
- ❑ Develop plan for collecting, transporting, and analysing samples.

DEMOBILISATION UNIT (*Planning Section)*

The Demobilisation Unit Leader is responsible for developing the Incident Demobilisation Plan and assisting Sections/Units in ensuring that orderly, safe, and cost-effective demobilisation of personnel and equipment is accomplished.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing and special instructions from Planning Section Chief.
- ❑ Review incident resource records to determine probable size of demobilisation effort.
- ❑ Participate in planning meetings, as required.
- ❑ Evaluate logistics and transportation capabilities required to support demobilisation.
- ❑ Prepare and obtain approval of Demobilisation Plan, including required decontamination.
- ❑ Distribute Demobilisation Plan to each processing point.
- ❑ Ensure that all Sections/Units understand their responsibilities within the Demobilisation Plan.
- ❑ Monitor implementation and assist in coordinating the Demobilisation Plan.
- ❑ Brief Resources Unit and Planning Section Chief on progress of demobilisation.
- ❑ Provide status reports to appropriate requesters.

H-7. Logistics Section

The Logistic function addresses the ORT and ICT needs for requisitioning or procuring resources (personnel, equipment, materials, and supplies) and services.

LOGISTICS SECTION CHIEF (*Logistics Section)*

The Logistics Section Chief, a member of the General Staff, is responsible for providing facilities, services, and material in support of the incident response. The Logistics Chief is responsible for seeing that adequate manpower, equipment and supplies are available to perform the necessary response operations. He/she must see that food, shelter, protective clothing, transportation, communication, and first aid facilities are available for all personnel requiring such assistance. The Logistics Chief participates in developing and implementing the Incident Action Plan and activates and supervises Branches and Units within the Logistics Section.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Coordinate the establishment of the command centre with input from the Incident Commander. Establish a base control point at a location that is agreed upon with the Incident and Deputy Incident Commanders.
- ❑ Assess the need for office facilities and personnel. Obtain input from the Incident Commander, General Staff, and Command Staff.
- ❑ Plan organization of Logistics Section, including names and locations of assigned personnel. Assign work locations and preliminary work tasks to Section personnel.
- ❑ Participate in Incident Action Plan preparation.
- ❑ Identify service and support requirements for planned and expected operations, including facilities, transportation, communications, food and housing, and security.
- ❑ Establish field control points at a location that is agreed upon with the Operations Section Chief and the Incident Commander.
- ❑ Provide input to, and review, Communications Plan, Medical Plan, Traffic Plan, and Vessel Routing Plan.
- ❑ Coordinate and process requests for additional resources.
- ❑ Review Incident Action Plan and estimate Section needs for next operational period.
- ❑ Advise on current service and support capabilities.
- ❑ Prepare service and support elements of the Incident Action Plan.
- ❑ Ensure all on-site service needs are met.
- ❑ Estimate future service and support requirements.
- ❑ Provide input to Demobilisation Plan as required by Planning Section.
- ❑ Recommend release of unit resources in conformance with Demobilisation Plan.
- ❑ Ensure general welfare and safety of Logistics Section personnel.

SECURITY MANAGER (*Logistics Section)*

The Security Manager is responsible to provide safeguards for protecting personnel and property from loss or damage, as well as ensuring that the general public is not allowed to interfere with the spill clean-up operation. The Security Manager also establishes security controls and maintains security at designated sites and advises of security procedures and systems.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Establish access control to spill site (check in, check out); arrange security patrols as necessary.
- ❑ Establish access control to command centre, field command centre, equipment depots, work sites, and recovered material collection points.
- ❑ Prepare and issue security passes to all authorised personnel.
- ❑ Establish security controls for agency representatives, workers, medical personnel, contractors, dignitaries, etc., to enter selected work sites. Arrange for security escort as necessary.
- ❑ Establish contacts and liaise with local law enforcement agencies, military, etc., as required. Arrange for any public access restrictions, such as facility, road, and beach closures.
- ❑ Contact Agency Representatives to discuss any special custodial requirements that may affect operations.
- ❑ Request required manpower and equipment necessary to ensure secure operations on site.
- ❑ Ensure that support personnel are qualified to manage security problems.
- ❑ Develop Security Plan for incident facilities. Adjust Security Plan for personnel and equipment changes and releases.
- ❑ Establish access control to press briefings.
- ❑ Attend induction/debriefing of contractors. Explain security procedures.
- ❑ Coordinate security activities with appropriate incident personnel.
- ❑ Keep the peace, prevent assaults, and settle disputes by coordinating with Agency Representatives.
- ❑ Prevent theft of government and personal property.
- ❑ Investigate all security incidents; agree course of action with the Incident Commander.
- ❑ Document all complaints and suspicious occurrences.

SUPPORT BRANCH MANAGER (*Logistics Section)*

The Support Branch Manager, when activated, is under the direction of the Logistics Section Chief, and is responsible for developing and implementing logistics plans in support of the Incident Action Plan, including providing personnel, equipment, facilities, and supplies to support incident operations. The Support Branch Manager supervises the operation of the Supply, Facilities, Ground Support, and Vessel Support Units, if activated.

- The **Supply Unit** is primarily responsible for placing orders for personnel, equipment and supplies; receiving, distributing, and storing all supplies for the incident; maintaining an inventory of supplies; and servicing non-expendable supplies and equipment.
- The **Facilities Unit** is primarily responsible for the layout and activation of incident facilities (e.g., Base, Staging Areas, Camp(s) and Incident Command Post). The Facilities Unit provides sleeping and sanitation facilities for incident personnel and manages base and camp operations. Each facility (base or camp) is assigned a manager who reports to the Facilities Unit and is responsible for managing the operation of the facility. The basic functions or activities of the Base and Camp Manager are to provide security service and general maintenance.
- The **Ground Support Unit** is primarily responsible for 1) coordinating transportation of personnel, supplies, food, and equipment on land; 2) fuelling, servicing, maintaining and repairing vehicles and other ground support equipment; 3) implementing the Incident Traffic Plan; and 4) supporting out-of-service shoreside resources.
- The **Vessel Support Unit** is primarily responsible for 1) coordinating transportation of personnel, supplies, food, and equipment for waterborne resources; 2) fuelling, servicing, maintaining, and repairing vessels and other vessel support equipment; and 3) implementing the Vessel Routing Plan; and 4) supporting out-of-service waterborne resources.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Identify Support Branch personnel dispatched to the incident.
- ❑ Determine initial support operations in coordination with Logistics Section Chief and Service Branch Director.
- ❑ Prepare initial organisation and assignments for support operations. Assign Unit Leaders, as necessary.
- ❑ Determine resource needs.
- ❑ Maintain surveillance of assigned unit work progress and inform Logistics Section Chief of activities.
- ❑ Resolve problems associated with requests from Operations Section.

SERVICE BRANCH MANAGER (*Logistics Section)*

The Service Branch Manager, when activated, is under the supervision of the Logistics Section Chief, and is responsible for managing all service activities at the incident. The Service Branch Manager supervises the operations of the Medical, and Food Units.

- The Medical Unit, under the direction of the Service Branch Director or Logistics Section Chief, is primarily responsible for developing the Medical Emergency Plan, obtaining medical aid and transportation for injured and ill incident personnel, and preparing reports and records. The Medical Unit may also assist Operations in supplying medical care and assistance to civilian casualties at the incident, but is not intended to provide medical services to the public.
- The Food Unit, under the direction of the Service Branch Director or Logistics Section Chief, is responsible for determining feeding requirements at all incident facilities, including: menu planning; determining cooking facilities required; food preparation; serving; providing potable water; and general maintenance of the food service areas.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Determine level of service required to support operations.
- ❑ Confirm dispatch of Service Branch personnel.
- ❑ Participate in planning meetings of Logistics Section personnel.
- ❑ Review Incident Action Plan.
- ❑ Assign and coordinate activities of Service Branch Units, as necessary.
- ❑ Inform Logistics Section Chief of activities.
- ❑ Resolve Service Branch problems.

COMMUNICATIONS UNIT (*Logistics Section)*

The Communications Unit Leader, under the direction of the Service Branch Manager or Logistics Section Chief, is responsible for developing plans for the effective use of incident communications equipment and facilities; installing and testing communications equipment; supervising the Incident Communications Centre; distributing communications equipment to incident personnel; and communications equipment maintenance and repair.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing from Service Branch Manager or Logistics Section Chief.
- ❑ Determine unit personnel needs.
- ❑ Advise on communications capabilities/limitations.
- ❑ Prepare and implement the incident Radio Communications Plan (ICS 205).
- ❑ Ensure the Incident Communications Centre and Message Centre are established.
- ❑ Set up telephone and public address systems.
- ❑ Establish appropriate communications distribution/maintenance locations.
- ❑ Ensure communications systems are installed and tested.
- ❑ Ensure an equipment accountability system is established.
- ❑ Ensure personal portable radio equipment from cache is distributed per radio plan.
- ❑ Provide technical information, as required on:
  - Adequacy of communications systems currently in operation.
  - Geographic limitation on communications systems.
  - Equipment capabilities.
  - Amount and types of equipment available.
  - Anticipated problems in the use of communications equipment.
- ❑ Supervise Communications Unit activities.
- ❑ Maintain records on all communications equipment, as appropriate.
- ❑ Ensure equipment is tested and repaired.
- ❑ Recover equipment from relieved or released units.

H-8. Finance Section

The Finance Section provides the right expertise to manage all financial transactions associated with emergency response operations. This responsibility includes the compilation of documentation needed to support requests for reimbursement from insurance carriers, compensation funds, and the receipt and processing of third-party claims. The finance function also is responsible for attending to all human resources issues that arise during the conduct of emergency response operations at any level (e.g., ORT, IMT, and public).

FINANCE/ADMINISTRATIVE SECTION CHIEF (*Finance Section)*

The Finance Section Chief, a member of the General Staff, is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance/Administration Section. They must be well versed in the company accounting practices. He/she acts as "Office Manager" for the response team, keeping track of all payments, receipts, contracts, etc., as the response progresses.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Attend briefing with Incident Command to gather information.
- ❑ Attend planning meetings to gather information on overall strategy.
- ❑ Determine resource needs.
- ❑ Develop an operating plan for Finance/Administration function on incident.
- ❑ Establish contracting and cost and expense tracking for incident.
- ❑ Conduct staff meeting with finance section personnel. Prepare work objectives, brief staff, make assignments, and evaluate performance.
- ❑ Inform members of the Unified Command and General Staff when Section is fully operational.
- ❑ Meet with assisting and cooperating company/agency representatives, as required.
- ❑ Provide input in all planning sessions on financial and cost analysis matters.
- ❑ Maintain daily contact with administrative headquarters on finance matters.
- ❑ Ensure that all personnel time records are completed and recorded according to policy.
- ❑ Establish claims telephone call-in number and claim verification process.
- ❑ Participate in all demobilisation planning.
- ❑ Ensure that all Mutual Aid arrangements and unit rates are clearly established.
- ❑ Brief Command personnel on all incident related business management issues needing attention and follow-up prior to incident closure.
- ❑ Establish bank/cash arrangements.
- ❑ Ensure that contractors are aware of invoice and audit requirements.
- ❑ Ensure that contractors are advised of details needed to satisfy insurance/audit requirements.

- ❑ Agree on warehouse inventories and stock control procedures with the Logistics Chief.
- ❑ Set up recordkeeping system for: contracts, work orders, purchase orders, invoices, and correspondence.
- ❑ Process invoices and disburse payments.
- ❑ Conduct on-site audit checks to ensure that:
  - Material charged is used.
  - Contract labour is working on project.
  - Equipment is being gainfully employed.
- ❑ As required, assist with preparation of contracts and purchase orders and with expediting material receipts (including customs clearance, if applicable).
- ❑ Provide the Operations Section Chief with information on the financial implications of actions taken or to be taken during response operations.
- ❑ Prepare cost summary for the Compensation/Claims Unit and the Deputy Incident Commander.

TIME/COST UNIT (*Finance Section)*

The Time/Cost Unit Leader is responsible for collecting all cost data, performing cost-effectiveness analyses, and providing cost estimates and cost-saving recommendations for the incident. The Time/Cost Unit Leader is also responsible for equipment and personnel time records.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing from Finance/Administration Section Chief.
- ❑ Determine resource needs.
- ❑ Coordinate with company headquarters on cost-reporting procedures.
- ❑ Obtain and record all cost data.
- ❑ Prepare incident cost summaries.
- ❑ Prepare resource-use and time cost estimates for Planning.
- ❑ Make recommendations for cost-savings to Finance/Administration Section Chief.
- ❑ Maintain cumulative incident cost records.
- ❑ Ensure that all cost documents are accurately prepared.
- ❑ Organize and establish Time Unit.
- ❑ Establish Time Unit objectives.
- ❑ Ensure that daily personnel and equipment time recording documents are prepared in compliance with time policies.
- ❑ Advise Ground Support Unit, Vessel Support Unit, Facilities Unit, and Air Support Group of the requirement to establish and maintain a daily record of equipment and personnel time reports.
- ❑ Assist units in establishing a system for collecting equipment and personnel time reports.
- ❑ Establish and maintain a file for personnel time reports within the first operational period.
- ❑ For each operational period, initiate, gather, or update a time report from all applicable personnel assigned to the incident.
- ❑ Verify that all personnel identification information is correct on the time report.
- ❑ Post personnel travel and work hours, transfers, promotions, specific pay provisions, and terminations to personnel time documents.
- ❑ Ensure that personnel time reports are signed.
- ❑ Close out time documents prior to personnel leaving the incident.
- ❑ Distribute all time documents according to company/agency policy.
- ❑ Maintain a log of overtime hours worked.
- ❑ Post all equipment time tickets within four hours after the end of each operational period.
- ❑ Prepare a use and summary invoice for equipment (as required) within 12 hours after equipment arrival at incident.

- ❑ Maintain current posting on all charges or credits for fuel, parts, services, and commissary.
- ❑ Verify all time data and deductions with equipment owners/operators.
- ❑ Complete all forms according to company/agency specifications.
- ❑ Provide for records security.
- ❑ Ensure that all records are current or complete prior to demobilisation.
- ❑ Release time reports from assisting organisational entities to the respective Representatives prior to demobilisation.
- ❑ Brief Finance/Administration Section Chief on current problems, recommendations, outstanding issues, and follow-up requirements.
- ❑ Provide reports to Finance/Administration Section Chief.

PROCUREMENT UNIT (*Finance Section)*

The Procurement Unit Leader is responsible for administering all financial matters pertaining to vendor contracts.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing from Finance/Administration Section Chief.
- ❑ Contact appropriate unit leaders on incident needs and any special procedures.
- ❑ Coordinate with local jurisdictions on plans and supply sources.
- ❑ Prepare and sign contracts and land use agreements, as needed.
- ❑ Draft memorandums of understanding.
- ❑ Establish contracts with supply vendors, as required.
- ❑ Interpret contracts/agreements and resolve claims or disputes within delegated authority.
- ❑ Coordinate with Compensation/Claims Unit on procedures for handling claims.
- ❑ Finalize all agreements and contracts.
- ❑ Coordinate use of funds, as required.
- ❑ Complete final processing and send documents for payment.
- ❑ Coordinate cost data in contracts with Cost Unit Leader.

COMPENSATION/CLAIMS UNIT (*Finance Section)*

The Compensation/Claims Unit Leader is responsible for the overall management and direction of all administrative matters pertaining to compensation-for-injury and claims-related activity for an incident.

- ❑ Review Common Responsibilities (Section H.2).
- ❑ Obtain briefing from Finance/Administration Section Chief.
- ❑ Establish contact with Safety Officer, Liaison Officer, and Company/Agency Representatives.
- ❑ Determine the need for Compensation for Injury and Claims Specialists and order personnel, as needed.
- ❑ If possible, co-locate Compensation-for-Injury work area with the Medical Unit.
- ❑ Obtain a copy of the Incident Medical Plan.
- ❑ Coordinate with Procurement Unit on procedures for handling claims.
- ❑ Periodically review documents produced by subordinates.
- ❑ Obtain Demobilisation Plan and ensure that Compensation-for-Injury and Claims Specialists are adequately briefed on Demobilisation Plan.
- ❑ Ensure that all Compensation-for-Injury and Claims documents are up to date and routed to the proper company/agency.

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APPENDIX I: GUIDELINES FOR RISK ASSESSMENT AND MANAGEMENT

Contents

Definitions

Accident Scenario

A sequence of events that results in undesirable consequences. An incident with specific safety consequences or impacts.

Acute hazard

The potential for injury or damage to occur as a result of an instantaneous or short duration exposure to the effects of an accident.

Administrative control

A procedural requirement for directing and/or checking engineered systems or human performance associated with plant operations.

As Low as Reasonably Practicable (ALARP)

Expresses that the risk level is reduced, through a documented and systematic process, so far that no further cost-effective measure is identified.

> **Note**: The requirement to establish a cost-effective solution implies that risk reduction is implemented until the cost of further risk reduction is grossly disproportional to the risk reducing effect.

Best Practice

In the context of these guidelines, best practice refers to standards/procedures for controlling risk above the level provided by the application of good practice.

Chronic hazard
The potential for injury or damage to occur as a result of prolonged exposure to an undesirable condition.

Consequence
The direct, undesirable result of an accident scenario (ex. usually involving a fire, explosion, oil spill or release of toxic material). Consequence descriptions may be qualitative or quantitative estimates of the effects of an accident in terms of factors such as harm to people, or the environment, economic loss, and equipment damage.

> **Note:** Consequence can be expressed as the number of people affected (injured or killed), property damaged, amount of oil spilled, environmental and socioeconomic resources impacted, outage time, mission delay, dollars lost, etc. Regardless of the measure chosen, the consequences are expressed "per event".

Consequence Analysis
The study of the possible extent (footprint) of harmful effects of potential incidents, e.g. calculation of the size of the flammable region of a vapor cloud following a spill.

Emergency
For the purpose of this guide, emergencies are defined as incidents that happen within the Kenya territory, create unacceptable impacts on people, the environment or property, and require the activation of the National Oil Spill Contingency Plan (NOSCP) to conduct emergency response operations.

Emergency Condition
A situation where a significant hazardous material release is in progress or will occur because no measures would be effective to prevent a release.

Emergency Response
A response effort by employees from outside the immediate release area or by other designated responders (e.g., mutual-aid groups, local fire departments, etc.) to an occurrence, which results, or is likely to result, in an uncontrolled release of a hazardous substance.

Event
An occurrence related to equipment performance or human action, or an occurrence external to the system that causes system upset. In this document an event is either the cause of or a contributor to an incident or accident, or is a response to an accident's initiating event.

Event Sequence
A specific, unplanned series of events composed of an initiating event and intermediate events that may lead to an accident.

External event
Event external to the system/facility/plant caused by (1) a natural hazard such as: earthquake, flood, tornado, extreme temperature, lightning, etc., or (2) a human induced event such as: vehicle or vessel collision or crash, nearby industrial activity, fire, sabotage, terrorism, etc.

Failure Modes and Effects Analysis (FMEA)
A systematic, tabular method for evaluating and documenting the causes and effects of known types of component failures.

Frequency
The number of occurrences per unit time (usually a year) at which observed events occur or are predicted to occur.

> **Note:** The frequency of a potential undesirable event is expressed as events per unit time, usually per year. The frequency should be determined from historical data if a significant number of events have occurred in the past. Often, however, risk assessment focuses on events with more severe consequences (and low frequencies) for which little historical data exist. In such cases, the event frequency is calculated using quantitative risk assessment models.

Good Practice
In the context of these guidelines, good practice refers to standards/procedures for controlling risk which have been judged and recognized by Kenya O&G as satisfying all the requirements when applied to a particular case in an appropriate manner. In this sense, written good practice is that contained in Kenya O&G standards and other engineering standards produced by globally recognized organizations such as: NFPA, API, ISO, etc.

Harm
Physical injury or damage to health, property or the environment

Hazard
An inherent physical or chemical characteristic that has the potential for causing harm to people, property, or the environment. In this procedure it is the combination of a hazardous material, an operating environment, and certain unplanned events that could result in an accident.

Hazard Identification
The pinpointing of material, system, process, and plant characteristics that can produce undesirable consequences through the occurrence of an accident.

Hazard and Operability (HAZOP) Study
A systematic method in which process hazards and potential operating problems are identified using a series of guide words to investigate process deviations.

Hazard Checklist
An experience-based list of hazards, potential accident situations, or other process safety concerns used to stimulate the identification of hazardous situations for a process or operation.

Initiating event
The first event in an event sequence. Can result in an accident unless protective systems or human actions intervene to prevent or mitigate the accident.

Intermediate event
An event that propagates or mitigates the initiating event during an accident sequence.

Likelihood
A measure of the expected frequency of an event's occurrence.

Major Accident Risk (MAR)
An occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any Kenya O&G facility, having the potential to cause one or more fatalities, immediate or delayed, inside or outside the facility, and involving one or more dangerous substances.

Mitigation system
Equipment and/or procedures designed to interfere with accident propagation and/or reduce accident consequences

Quantitative Risk Assessment (QRA)
The process of hazard identification, followed by numerical evaluation of consequences and frequencies, and their combination into an overall measure of risk. QRA is based on the application of engineering evaluation and mathematical techniques. Ordinarily applied to accident scenarios. Is related to Probabilistic Risk Assessment (PRA) used in the nuclear industry.

Risk
The risk associated with an event is defined as the product of the likelihood of the event and the consequence (severity) of the outcome of that event. The likelihood is defined in terms of the annual frequency of the outcome. The consequence of the outcome is defined in terms of the harm caused by the event. Risk is defined as the product of the frequency with which an event is anticipated to occur and the consequence of the event's outcome, i.e. Risk = Frequency × Consequence

> **Note:** Thus, the above equation has the units "events/year" times "consequences/event", which equals "consequences/year", the most typical quantitative risk measure.

Risk Assessment
Overall process of risk analysis and risk evaluation, which consists of deciding whether or not the risk is tolerable.

Risk Estimation
Process used to produce a measure of the level of risks being analyzed. Risk estimation consists of frequency analysis, consequence modelling, and integration of frequency and consequences.

Risk Management
The systematic application of management policies, procedures and practices to the tasks of analyzing, evaluating and controlling risk in order to protect employees, the general public, the environment and company assets

Risk Reduction Measure
A specific hardware, software system, or administrative control designed to maintain a process within safe operating limits, to safely shut it down in the event of a process upset, or to reduce human or environment exposure to the effects of an upset.

Risk Tolerability Criteria
Criteria that are used to express a risk level that is considered tolerable for the activity in question.

> **NOTE**: Risk Tolerability Criteria are used in relation to risk assessment and express the level of risk, which will be tolerable for the activity. It is the starting point for further risk reduction according to the ALARP principle. It may be qualitative or quantitative.

Safety
Freedom from intolerable risk.

Safety System
Equipment and/or procedures designed to limit or terminate an accident sequence, thus mitigating the accident and its consequences.

Tolerable Risk
Risk that has been reduced to a level that can be endured by Kenya O&G.

Worst Case Scenario
A conservative (high) estimate of the consequences of the most severe accident scenario identified.

> **NOTE:** Worst-case scenarios can vary according to the receptors at risk, e.g. for employees in the immediate area of a flammable release it may be a jet fire, whereas for employees further away it may be a flash fire.

Worst Credible Case Scenario

The most severe accident scenario considered plausible or reasonably believable.

I-1. Risk Assessment and Management

Risk assessment involves the identification of hazards posed by a project, facility or operation and the evaluation of different hazard scenarios. The risk assessment is the first stage of the risk management process, as no action can be made to avoid or reduce the effects of hazards that have not been identified and evaluated. Conducting a Risk Assessment involves the use of a structured and systematic approach to identify and evaluate potential hazards. A large number of risk assessment methodologies exist that can be used at various stages during the life cycle of a project, facility, or series of operations. Appendix J-1 depicts some of these methodologies.

This Risk Assessment and Management Addendum to the Kenya NCP provides a qualitative and semi-quantitative risk assessment process for Kenya O&G. It covers Upstream, Midstream, and Downstream operations, facilities and activities (e.g., wells, flow-lines, fuel & oil trucks, producing facilities, vessels, pipelines, drilling) through all life-cycle phases (identification, concept selection, project definition and execution, operation, monitoring, and decommissioning) and is to be used by those responsible for planning and developing Kenya O&G projects as well as those involved in ongoing process safety and environmental risk management.

The main purpose of this document is to provide a risk matrix for qualitative and semi-quantitative risk assessment to help Kenya O&G understand the hazards and potential major accident risks (MAR) that could occur at or near a facility, as well as developing an awareness of the possible causes and contributing factors.

Guidelines for systematically and comprehensively identifying and assessing safety hazards and environmental risks arising from Kenya O&G projects, facilities and activities are provided. The intention of these guidelines is to ensure a consistent approach to qualitative and semi-quantitative risk assessment (as applicable to hydrocarbons and HNS accidents) is established in the O&G industry and applied throughout the entire lifecycle of all projects, operations, and facilities in Kenya. Such a Risk Assessment is needed in order to:

- Comply with regulatory requirements;
- Comply with government policy and business requirements;
- Assess the risk imposed by O&G activities, existing facilities and projects to personnel, public, environment, business, or assets;
- Ensure that adequate measures are taken to eliminate, or reduce those risks to a tolerable and as low as reasonably practicable (ALARP) level.

I-2. Guidelines for the Risk Assessment Process

The primary objectives of risk assessment are to identify and rank the risks so that they can be adequately assessed and managed and to examine associated risk reduction measures to determine those most suitable for implementation. In this context, the main role of risk assessment is to provide an input into the decision-making process and assist Kenya O&G in demonstrating that:

- All hazards have been identified;
- All risks have been evaluated; and,
- Adequate measures have been, or will be, taken to control the risks to a tolerable and ALARP level.

Risk Assessment Approaches

Risk assessment methodologies need to be proportionate to the magnitude of risk being analyzed; i.e. the risk assessment methodology utilized in each case must be efficient and should normally progress from qualitative to semi-quantitative, and finally fully quantitative risk assessment (QRA), if required. The lower levels of assessment (qualitative and semi-quantitative) are considered most appropriate for hazard screening.

The usual approach to deciding the appropriate level of risk assessment shall be to start with a qualitative approach and to elect for more detail whenever it becomes clear that the current level of detail is unable to allow for a clear understanding and assessment of the risks. However, to save time and budget yet still achieve high quality results, a highly competent and experienced risk assessment person may decide to start the process with a semi-quantitative or QRA to make the process more efficient.

Risk Assessment Methodologies

A large number of risk assessment methodologies exist that can be used at various stages during the life cycle of a project, facility, or series of operations. Appendix A-1 summarizes the most common risk assessment methodologies available for use in Kenya O&G projects and facilities. As an addendum of the oil spill NCP, this document is limited to qualitative and semi-quantitative risk assessment.

A comprehensive risk assessment study may not be necessary for every occasion. The methodology applied to specific systems or activities is based on the needs of the analysis and the complexity of the system. The risk assessment study objectives, intention, and scope must be clearly defined. The goals and objectives will vary according to specific needs or requirements. Risk assessment objectives include, but are not limited to, the following:

- Estimating risk to people, the environment, or assets;
- Emergency planning;
- Contingency planning for oil spills;
- Meeting legal or regulatory requirements;

- Estimating business interruption risk;
- Identifying Safety Critical Elements (SCEs);
- Evaluating risk reduction measures;
- Prioritizing safety investments.

I-3. Application of the Risk Assessment and Management Process

The lifecycle for O&G upstream activities and facilities can be expressed in four phases: Explore, Develop, Produce, and Abandon (Appendix J-2). Risk is highly impacted by decisions made throughout this lifecycle, particularly by decisions made during the early stages of the design.

The risk assessment and management process shall be applied during each phase of the O&G project lifecycle in order to reduce risks to a tolerable and ALARP level. The process involves a number of generic stages for identifying, understanding and reducing the risk(s).

Stages for evaluating risk:

i. Identify (Hazard Identification)
   - The hazard(s) (i.e. what could cause harm)
   - Who or what could be exposed to the hazards?

ii. Understand and evaluate (risk estimation)
   - The possible consequences of the hazard(s)
   - The possible accident scenarios and their frequency
   - The possible exposures to the consequences of those events

iii. Assess (risk assessment)
   - The significance of the risk arising from the combination of the frequency of the accident scenarios and exposure to their consequences
   - The tolerability of the risks

Stages for risk reduction (risk management):

iv. Select
   - The appropriate measure to reduce the risk to a sufficiently low level (i.e. tolerable and ALARP level), including risk elimination where economically and technically feasible; where there are alternative measures, evaluate the options

v. Implement
   - The risk reduction measures to ensure safe operation

vi. Monitor and review
   - The implementation of the control measures to ensure their integrity is maintained and to give assurance of ongoing safety
   - To learn from experience and to identify and explore opportunities for risk reduction improvements

vii. Communicate

- To all those with a part to play in the risk assessment and management process to ensure they know what they may have to do
- To those to whom the risks may give cause for concern and require assurance that the risks are being properly managed

I-4. Description of the Risk Assessment and Management Process

Hazard Identification (Stage i)

One key element of effective safety risk management is a systematic approach to hazard identification. The Hazard Identification methodology applied shall consider all the factors involved in the system under study. This shall include all modes of operation (routine and non-routine activities), emergencies, as well as external hazards.

Hazard identification involves the identification of hazards posed by a project or a facility and evaluating possible scenarios leading to unwanted consequences. To this end, there are a large number of techniques that can be used to perform this task at various stages during the life cycle of a project or facility. These vary from a concept HAZID, which is performed as early as possible in the concept stage of the process, to a HAZOP study, which can be performed on a project, or on an operational facility. The level of detail of each hazard identification technique varies significantly, e.g. a concept HAZID can only be used to understand the potential major hazards of a project, whereas a HAZOP study is conceived to be in depth and systematically review the design of a project, and/or an existing facility. Hence, it is important to choose the most appropriate technique for the hazard identification study being undertaken.

General Approach

Hazard identification is a qualitative brainstorming process that shall be undertaken by a group of skilled and experienced people with knowledge of the particular facility, project and/or activity under scrutiny.

The hazard identification studies shall utilize teams with the appropriate skills and experience, depending upon the facility and the systems under review. The team shall:

- Provide the right mix of expertise involving all relevant organizations,
- Provide an experienced chairperson,
- Include personnel with a thorough knowledge of the facility and its history,
- Involve manufacturers, contractors and suppliers as necessary,
- Include personnel with sufficient technical expertise in areas relevant to the facility, such as process plant knowledge, or maintenance procedures,
- Include designers to allow for capturing of design intent.

Hazard Identification Techniques

Hazards are diverse, and many different techniques are available for hazard identification. Hence, selecting the appropriate hazard identification technique for a particular application is not a

straightforward task. The selected technique shall meet the objectives of the study as efficiently as possible given the available information and expertise.

The hazard identification techniques accepted for use in Kenya O&G Industry projects, facilities and activities are briefly described below, however a complete description with examples can be found in "Guidelines for Hazard Evaluation Procedures" (Section 5 References). These techniques have been extensively used for many years in the international O&G industry, and are demonstrably appropriate for use in a wide variety of situations.

Hazard Identification (HAZID) Technique. HAZID is a general term used to describe an exercise whose goal is to identify hazards and associated events that have the potential to result in a significant consequence. For example, a HAZID of an offshore petroleum facility may be conducted to identify potential hazards, which could result in consequences to personnel (e.g., injuries and fatalities), the environment (oil spills and pollution), and/or financial assets (e.g., production loss/delay). The HAZID technique can be applied to all or part of a facility or vessel or it can be applied to analyse operational procedures. Depending upon the system being evaluated and the resources available, the process used to conduct a HAZID can vary. Typically, the system being evaluated is divided into manageable parts, and a team is led through a brainstorming session (often with the use of checklists) to identify potential hazards associated with each part of the system. This process is usually performed with a team experienced in the design and operation of the facility, and the hazards that are considered significant are prioritized for further evaluation.

What-if Analysis. What-if analysis is a brainstorming approach that uses broad, loosely structured questioning to (1) postulate potential upsets that may result in mishaps or system performance problems, and (2) ensure that appropriate safeguards against those problems are in place. This technique relies upon a team of experts brainstorming to generate a comprehensive review and can be used for any activity or system. What-if analysis generates qualitative descriptions of potential problems (in the form of questions and responses) as well as lists of recommendations for preventing problems. It is applicable for almost every type of analysis application, especially those dominated by relatively simple failure scenarios. It can occasionally be used alone, but most often is used to supplement other, more structured techniques (especially checklist analysis).

Checklist Analysis. Checklist analysis is a systematic evaluation against pre-established criteria in the form of one or more checklists (see Table 3-2 in Appendix J-3 for examples). It is applicable for high-level or detailed-level analysis and is used primarily to provide structure for interviews, documentation reviews and field inspections of the system being analysed. The technique generates qualitative lists of conformance and non-conformance determinations with recommendations for correcting non-conformances. Checklist analysis is frequently used as a supplement to or integral part of another method (especially what-if analysis) to address specific requirements.

Hazard and Operability (HAZOP) Analysis. The HAZOP analysis technique uses special guidewords to prompt an experienced group of individuals to identify potential hazards or operability concerns relating to pieces of equipment or systems. Guidewords describing potential deviations from design intent are

created by applying a predefined set of adjectives (i.e. high, low, no, etc.) to a pre-defined set of process parameters (flow, pressure, composition, etc.). The group then brainstorms potential consequences of these deviations and if a legitimate concern is identified, they ensure that appropriate safeguards are in place to help prevent the deviation from occurring. This type of analysis is generally used on a system level and generates primarily qualitative results, although some simple quantification is possible. The primary use of the HAZOP methodology is identification of safety hazards and operability problems of continuous process systems (especially fluid and thermal systems). For example, this technique would be applicable for an oil transfer system consisting of multiple pumps, tanks, and process lines. The HAZOP analysis can also be used to review procedures and sequential operations.

Failure Modes and Effects Analysis (FMEA). FMEA is an inductive reasoning approach that is best suited for reviews of mechanical and electrical hardware systems. The FMEA technique (1) considers how the failure mode of each system component can result in system performance problems and (2) ensures that appropriate safeguards against such problems are in place. This technique is applicable to any well-defined system, but the primary use is for reviews of mechanical and electrical systems (e.g., fire suppression systems, vessel steering/propulsion systems). It also is used as the basis for defining and optimizing planned maintenance for equipment because the method systematically focuses directly and individually on equipment failure modes. FMEA generates qualitative descriptions of potential performance problems (failure modes, root causes, effects, and safeguards) and can be expanded to include quantitative failure frequency and/or consequence estimates.

Contribution of "Human Factors" Issues. In any effort to identify hazards and assess their associated risks, there must be full consideration of the interface between the human operators and the systems they operate. Human Factors Engineering (HFE) issues can be integrated into the methods used to identify hazards, assess risks, and determine the reliability of safety measures. For instance, hazard identification guidewords have been developed to prompt a review team to consider human factor design issues like access, control interfaces, etc. An understanding of human psychology is essential in estimating the effectiveness of procedural controls and emergency response systems.

Persons performing risk assessments need to be aware of the human factors impact, and training for such persons can improve their ability to spot the potential for human contributions to risk. Risk analysts can easily learn to spot the potential for human error any time human interaction is an explicit mode of risk control. However, it is equally important to recognize human contributions to risk when the human activity is implicit in the risk control measure. For example, a risk assessment of a boiler would soon identify "overpressure" as a hazard that can lead to risk of rupture and explosion. The risk assessment might conclude that the combination of two pressure control measures will result in an acceptably low level of risk. The two measures are: 1) have a high-pressure alarm that will tell the operator to shut down the boiler and vent the steam, and 2) provide an adequately sized pressure relief valve. The first risk control measure involves explicit human interaction. Any such control measure should immediately trigger evaluation of human error scenarios that could negate the effectiveness of the control measure. The second risk control measure involves implicit human interaction (i.e., a functioning pressure relief valve does not appear on the boiler all by itself but must be installed by maintenance personnel.)

A checklist of common errors or an audit of the management system for operator training are examples of methods used to address the human error potential and ensure that it also is controlled. The purpose of any tool would be to identify the potential for error and identify how the error is prevented. Does the operator know what the alarm means? Does he know how to shut down the boiler? What if the overpressure event is one of a series of events (e.g. what if the operator has five alarms sounding simultaneously)? Did the engineer properly size and specify the relief valve? Was it installed correctly? Has it been tested or maintained to ensure its function? A corollary to each of the above questions is required in the analysis: "How do you know?" The answer to that last question is most often found in the management system, thus "Human Factors" is the glue that ties risk assessment from a technology standpoint to risk assessment from an overall quality management standpoint.

The above hazard identification techniques can be performed at several stages during the lifecycle of a project or facility (see Appendix J-2). Not all of the hazard identification techniques are suitable for all stages in the lifecycle. Some of the techniques may be suitable to more than one stage in the life cycle, but others have been specifically developed for one stage and it would be inappropriate to apply these in some of the other stages.

A list of typical hazards and a hazard identification checklist are provided in Appendix J-3: Hazard Identification Tools.

Selecting the Hazard Identification Technique

It is impossible to compare hazard identification techniques and come to any conclusion as to which is the best; there may be no "best" method for a particular application. Each technique has its unique strengths and weaknesses as it has been developed for a specific range of circumstances considering many factors, including the resources required to undertake the analysis, expertise available and stage of the process. Understanding these attributes is prerequisite to selecting an appropriate hazard identification technique.

Management shall define the basic scope for a hazard identification study; such as the main objective of the study, the type of decision-making information (results) needed, the resources and deadlines for performing the work, etc. However, the hazard identification chairperson shall select the most appropriate technique to fulfill the study's charter.

Risk Estimation (Stage ii)

It is important to employ realism and lateral thinking in hazard identification to identify, not only obvious hazardous events, but also potentially complex events, such as those consisting of a sequence of failures or a set of concurrent problems. Therefore, the hazard identification team should:

- Challenge assumptions and existing norms of design and operation to test whether they may contain weaknesses,
- Think beyond their immediate experiences,
- Explore the effect of failure of management systems, controls and procedures,

- Consider how relatively minor problems may grow into MARs when other problems arise to compound the seriousness,
- Explore the potential for the initiating event or another factor to render all the protective measures ineffective,
- Consider worst-case scenarios in addition to those scenarios or events used for the design basis of the facility,
- Include in the hazard identification the full range of factors that can result in a hazard with the potential for a MAR (e.g. technology used, human error, systems in place, the type of task, the operating mode and external factors),
- Include in the hazard identification all modes of operation (e.g. commissioning, shut down, start up, changes/modifications, maintenance, decommissioning, etc.).

Depth of Analysis

The hazard identification process shall provide sufficient detail to fully understand the nature of each hazard and to identify the risk reduction measures necessary for the management of each hazard. It is crucial to get to the most basic/root causes (or hazards) leading to an undesirable event or MAR. The hazard identification should also detail when, where and why the hazard is present. This will greatly help in the assessment of the relevant risk reduction measures as part of the remainder of the Risk Assessment and Management process.

Risk Assessment (Stage iii)

After the hazards have been identified, the risks arising from them shall be evaluated either qualitatively or quantitatively. This typically requires carrying out a first stage "risk estimation", which entails assessing both the severity (consequences) and frequency (likelihood) of hazardous events. The amount of detail and effort required to complete this first stage increases from qualitative to semi-quantitative and to quantitative risk assessment (QRA), as described below.

Risk assessment shall be applied as an aid to the decision-making process. As options are evaluated, it is critical to analyze the level of risk introduced with each option. The analysis can address financial risks, health risks, process safety risks, environmental risks and other types of business risks. An appropriate analysis of these risks will provide information critical to a safe and good decision-making, and will often clarify the decision to be made. The information generated through risk assessment shall be communicated to the organization to help impacted parties understand the factors which influenced the decision.

In order to protect their citizens and natural resources, the Energy and Petroleum Regulatory Authority (EPRA) or the NCP lead agency (KMA or NEMA) can become involved in the risk assessment and management process, requiring corporations to employ risk reduction measures, secure certain types of insurance and, in some cases, demonstrate that they can operate with a tolerable and ALARP level of risk. For example, KMA or NEMA can require new facilities to describe "worst case" and "expected" environmental release scenarios to be included in their Tier1 OSCP, as part of the permitting process. Examples of government involvement include (but are not limited to) the United States and the United

Kingdom where submittal of "Worst Cases Scenarios" and "Safety Cases" is required in order to demonstrate the level of risk associated with each oil and gas production facility.

Risk Management (Stage iv and v)

Risk management entails selecting and implementing risk reduction measures that will reduce risks to a tolerable and ALARP level. Note that oil spill contingency strategies are considered as risk reduction measures that mitigate risk and are therefore part of the activity.

The following aspects shall be considered during the risk reduction, alternative selection, and implementation stages:

- The risk assessment and management study shall show, through reasoned and supported evidence, that the risk reduction measures adopted reduce the risk to a tolerable and ALARP level (i.e. adopting additional or alternative risk reduction measures is grossly disproportionate when comparing sacrifice to environmental benefit). When providing these risk reduction measures, the risk assessment team shall:
    - Assess the feasibility of known control measures for reducing oil spill risks
    - Detail selected risk reduction measures and their proposed level of effectiveness
    - Explore options for improving the level of effectiveness of the risk reduction measures
    - Consolidate risk reduction measures without reducing the clarity of their effectiveness
- The risk assessment team shall be aware that the adoption of some risk reduction measures may introduce new or modify existing risks. Consequently, they shall ensure that any new or increased risks are equally considered in the risk assessment.
- When adopting risk reduction measures, the level of detail provided should be commensurate with the criticality of the risk reduction measure and the level of risk reduction it achieves. This aspect is critical for the subsequent development of the performance standards for each risk reduction measure.
- The criticality and effectiveness of the risk reduction measures shall be defined by the risk assessment team in terms of: functionality, availability, reliability, survivability, independence and compatibility.

Monitor and Review (Stage vi)

The risk assessment and management study shall be periodically monitored, reviewed and updated by competent staff based on the magnitude of risks. This task shall incorporate those parts of the organization, which are involved in day-to-day management of the risks, i.e. the operations and maintenance functions. The purpose of this updating is to ensure the effectiveness and relevance of the of the risk assessment study. Typically, the following aspects shall be verified:

- Has the plant/equipment performance lived up to the expectations of the original design in terms of accidents, incidents and equipment uptime?

- Have there been significant and unexpected changes in age and/or technical integrity of equipment e.g. excessive corrosion, wear/tear?
- Have there been significant hardware changes and if so, has the associated risk been adequately reviewed in the context of previously defined risk levels?
- Is the average experience level of plant operators and maintainers still the same?
- Can new technology provide lower (and possibly cheaper) ALARP levels?
- Have legislation and/or public perceptions changed regarding what is now considered tolerable/intolerable?
- Have there been changes outside Kenya O&G influence which could affect overall risk levels e.g. population build-up around facilities in previously isolated areas, etc.?

Communicate (Stage vii)

The outcome from all the stages involved in a case specific risk assessment and management process must be communicated to personnel that participate in the process, the people or organizations assigned with action items, and all stakeholders that could be impacted by the risk management strategy. Appendix 6 provides an example of what may be involved in Stage vii.

I-5. Application of Risk Assessment and Management.

In practice, the application of risk assessment and management will not necessarily involve all the stages of the process. Also, in some cases, the sequence might vary with certain stages being carried out more or less simultaneously and with some iteration between stages to evolve the optimum solution. However, in all cases hazard identification to an appropriate extent (i.e. Stage i) is a vital starting point. Thereafter, different situations may call for different approaches for Stages ii to iv. In some cases, for example, the selection of control measures (Stage iv) will start as soon as the hazards are identified. Whatever risk assessment and management approach is adopted, an appropriate implementation of Stages v to vii is always necessary.

In terms of risk estimation and assessment, there are three different approaches. One approach, quantitative risk assessment (QRA), is not included in the scope of this document, and hence it is not described. The other two approaches (qualitative and semi-quantitative) are described below.

Qualitative Risk Assessment

The qualitative risk assessment approach is typically applied where the hazards are mostly self-evident from past experience and the measures for effective risk reduction are well defined. The measures for effective risk reduction are typically laid down in national legislation, codes of practice, industry or company standards, all of which will have been developed through best operating practices based on the lessons learned from experience. Situations where the qualitative risk assessment approach can be used are:

- Mature and small range technology in use,
- Further developments are unlikely,

- Hazards are well known,
- Risk reduction measures can be easily specified,
- Facilities/projects which are a repeat of earlier designs; studies undertaken for the original design may be deemed sufficient to determine the risk reduction measures,
- Studies for facilities/projects in the early design phases; these will be less detailed than those undertaken during later design phases, and will focus on design issues rather than management and procedural aspects.

The qualitative risk assessment approach is appropriate and may be applied as long as legislation, codes, and standards fully cover the hazards and situations to which they are applied. However, it is crucial to understand that hazards and situations frequently change. Problems can arise from a rigid application of the legislation, codes, and/or standards if their applicability is not properly understood. For example, a potentially dangerous situation could arise where a change introduces a hazard for which the legislation, codes, or standards do not provide proper protection. Conversely, a change may decrease the hazard and the legislation, codes, standards could then lead to over protection with possibly unnecessary cost.

Semi-Quantitative Risk Assessment

The semi-quantitative risk assessment approach requires hazard identification (Stage i) to be accomplished by a mixture of creative thinking and structured critical examination, and then subjected to a technical analysis to help decide the most effective risk reduction measures. It requires an appropriately detailed consideration of Stages i to iv on a case-by-case basis and allows the risk assessment team more scope for judgement, and flexibility to cope with virtually any situation.

Situations where the semi-quantitative risk assessment approach may be more appropriate are:

- Complex facilities/projects involving a wide range or novel technology,
- A hazard identification study has revealed a potentially severe event, which would be difficult or expensive to protect against,
- Risk reduction measures need to be developed on a case by case basis,
- A major accident either within Kenya O&G or elsewhere in the industry suggests the possible need to retrofit additional safety measures,
- A major modification or upgrading of an existing facility or activity occurs ,
- Occurrence of frequent failures indicating the existence of defects either in the design of the facility, or in its operation,
- Performance of non-routine tasks, or tasks which have no safe operating practice established,
- Non-compliance with Kenya O&G codes and standards due to unavoidable constraints (spacing, unacceptable cost, etc.).

In any case, the application of the semi-quantitative risk assessment method shall follow the seven stages established in this Addendum, with the following considerations:

- **Stage i:** Hazard Identification shall be accomplished using the appropriate technique from those described in section 2.4.1.2; incidents that have occurred on similar processes, both within Kenya O&G and elsewhere, need to be reviewed and the lessons learned taken into account.
- **Stage ii:** Risk Estimation shall be accomplished using Risk Assessment Matrix (see example in Appendix 6). This stage might require some technical analysis to understand the possible consequences of hazardous events and their frequency. To this end:
  - It is often necessary to define accident scenarios to increase understanding of the consequences of hazardous events, particularly when several alternative outcomes are possible (e.g. Jet Fire, Vapour Cloud Explosion, etc.). Potential consequences of an event shall be estimated considering the worst credible case scenario.
  - The frequency of occurrence of the accident scenarios identified during severity assessment must be determined. This frequency is determined after taking into consideration the existing risk reduction measures in place to prevent occurrence of the scenarios, as well as those to mitigate the severity of the consequences.
- Once the frequency and consequences are determined as per stage ii above, Stage iii Risk Assessment shall be accomplished by defining the risk and its tolerability using the Risk Matrix. The risk shall be defined by plotting frequency and consequences in the risk matrix. The region of the risk matrix (i.e. Acceptable, ALARP, or Intolerable) on which the risk falls determines its tolerability. This stage shall allow for:
  - The complete range of risks to be considered
  - Ranking the risks in order of significance so that the more serious risks can be given priority attention
  - Comparing the risks against the Kenya O&G Risk Tolerability Criteria, also provided in the Risk Matrix of Appendix 6.
- Stage iv will often precede in parallel with stages i to iii as there may be alternative risk reduction options that need to be evaluated in terms of efficacy, cost, practicability. This stage shall be accomplished using the following guidance:
  - Appendix J-4 provides guidance for the risk assessment team to work through several considerations for selecting the appropriate risk reduction measures
  - Appendix J-5 provides guidance for introducing risk-reducing measures if the risks exceed the RTC, or if there are other reasonable measures that can be justified. Consideration shall be given to reducing risk to a level deemed tolerable and ALARP reflecting among other factors local conditions and circumstances, the balance of cost and benefits and the current state of scientific and technical knowledge.

- **Note:** The use of inherently safer design principles to manage risks is preferred. A progressive approach to risk reduction shall be adopted, giving attention first to those measures which have greatest effect in eliminating or reducing the frequency of hazardous events occurring for the least effort. Successive evaluations of risk reduction measures shall be undertaken until the RTC have been satisfied, and it has been demonstrated that the risks are tolerable and ALARP.

- Stage v (Implement). This stage requires procedures to ensure that the selected measures are properly specified, designed, installed, operated and maintained.
- Stage vi (Monitor and Review). This stage requires the implementation of routine and systematic monitoring and review of performance. The objectives are not only to ensure that the risk continues to be controlled at least to a tolerable and ALARP level, but that opportunities for risk reduction are identified, examined and implemented where reasonably practicable.
- Stage vii (Communicate). This stage requires the implementation of appropriate communication whenever needed during the risk assessment and management process to inform those who may need information about the risks, what actions are required, and assurance that these risks are being properly managed. Communication systems shall be implemented internally within the Kenya O&G organization and externally for regulators, emergency services, and the general public.

The Risk Assessment Matrix

Section 3 of the NCP depicts the risk assessment matrix to be used for the semi-quantitative risk assessment and management process within Kenya O&G. An example of using the risk assessment matrix is included in Appendix 6 of this addendum.

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APPENDIX J RISK ASSESSMENT AND MANAGEMENT TOOLS

Contents

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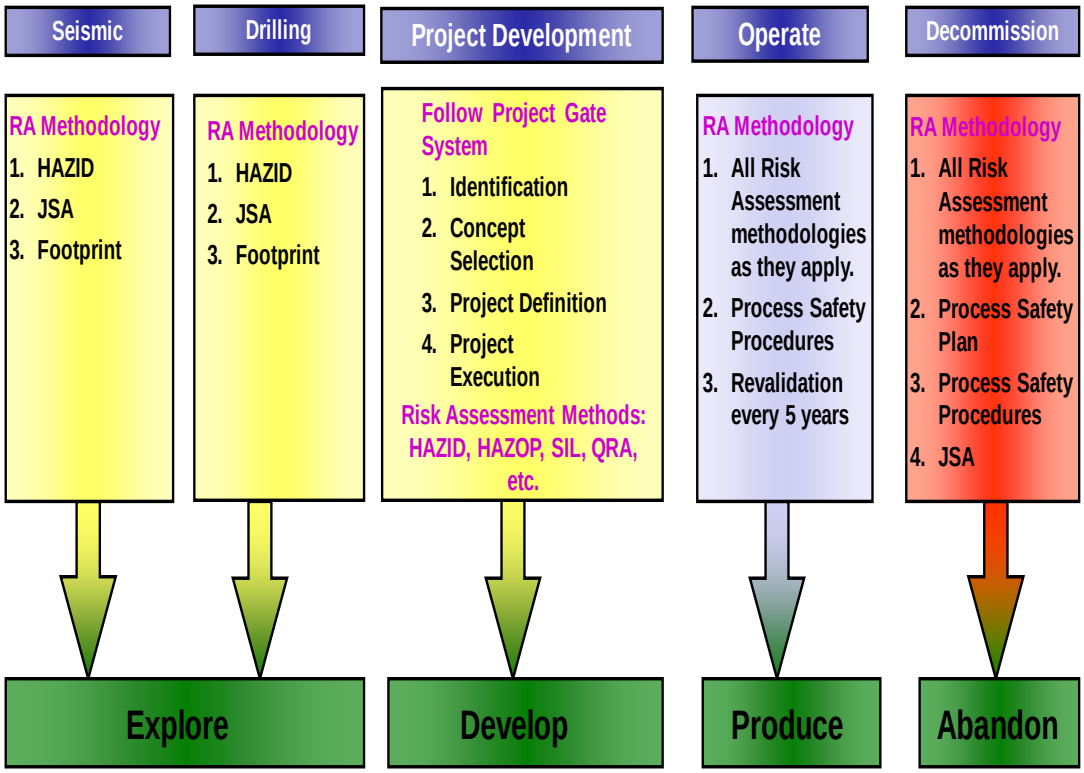
J-1. Most Common Risk Assessment Methodologies and their Purpose

APPROACH	QUALITATIVE					SEMI-QUANTITATIVE		QUANTITATIVE				
Methodology	**Job Safety Analysis**	**HAZID**	**What If /Checklist**	**Bow-Tie**	**HAZOP**	**Layers of Protection Analysis (LOPA)**	**Failure Mode and Effect Analysis (FMEA)**	**Building Risk Assessment (BRA)**	**Fault Tree Analysis (FTA)**	**Event Tree Analysis (ETA)**	**Consequence Modelling**	**QRA**
Identify Hazards	√	√	√	√	√		√					√
Identify the path from cause to consequence				√			√					
Identify and maps out the barriers to prevent or mitigate the causes or consequences of hazards.				√								
Identify Opportunities to Eliminate Hazards	√	√	√	√	√							√
Qualitative Estimate of Frequency					√							
Identify Accident Initiating Events					√	√	√		√			
Estimate Frequency of Initiating Events						√		√	√			
Identify Opportunities to Reduce Frequency of Initiating Events						√	√	√	√			
Identify Accident Events Sequence and Consequences						√		√		√		√
Estimate Frequency of Event Sequences						√		√		√		√
Estimate Magnitude of Consequences of Event Sequences								√			√	√
Identify Opportunities to Reduce Frequency and/or Consequences of Event Sequences						√			√	√	√	√

J-2. Application of Risk Assessment Methodologies to the Lifecycle of O&G Projects



J-3. Hazard Identification Tools

Table J-1. List of typical hazards

No.	Typical Hazard
1	Electrical Hazards
2	Loss of Containment (from Hydrocarbon Systems)
3	Design or Construction Hazards
4	Equipment/Instrumentation Malfunction
5	Electrical Upsets/Malfunctions
6	Utility Failures
7	Hazardous Materials (radioactive, toxic, explosives)
8	Inert gases
9	High pressure gases
10	Operating Hazards (Errors and Other Human Factors)
11	Commissioning Hazards
12	Lifting / Dropped Objects
13	Road Traffic Hazards
14	External Effects or Influences
15	Others

Table J-2 Checklist for Hazard Identification

Have the following potential causes of risk been considered?	Yes	No	Remarks
1. General Causes of Risk			
1.1 Is there uncertainty in definition of design requirements?			
1.2 Is there uncertainty in basic design data?			
1.3 Is there uncertainty in design techniques?			
1.4 Is there a procedure for checking work?			
1.5 Are there potential external threats; e.g. flood?			
1.6 Is there a risk of human failure?			
1.7 Is sensitivity of design an issue?			
1.8 Is there complex equipment prone to breakdown?			
1.9 Are there complicated equipment or control loops?			
1.10 Is there a risk of leaks of toxic or flammable materials?			
1.11 Does major rupture or disintegration give an unacceptable hazard?			
2 Risk to Health, Safety, Plant and Environment			
2.1 **Risks to Health**			
2.1.1 Are dangerous materials present:			
2.1.1.1 Toxic?			
2.1.1.2 Corrosive?			
2.1.1.3 Bacteria / micro-organisms?			
2.1.1.4 Particulates?			
2.1.2 Are noise levels potentially high?			
2.1.3 Are vibration levels potentially high?			
2.1.4 Is Manual Handling of heavy weights involved?			
2.1.5 Is radiation or radioactive material present?			

Have the following potential causes of risk been considered?	Yes	No	Remarks
2.1.5.1 Nuclear radiation			
2.1.5.2 Thermal radiation			
2.2 Risks to People from:			
2.2.1 Risk of explosion due to flammable atmosphere?			
2.2.2 Electric shock?			
2.2.3 Dropped objects; e.g. from cranes?			
2.2.4 Stored energy (high pressure gas, LPG)?			
2.2.5 Hot / cold surfaces?			
2.2.6 Severe environment?			
2.2.7 Vehicle movement?			
2.2.8 Equipment congestion?			
2.2.9 Work at height?			
2.2.10 Work in confined spaces?			
2.2.11 Work in excavations, pits?			
2.2.12 Poor access?			
2.2.13 Poor lighting?			
2.2.14 External threats?			
2.2.15 Inadequately trained personnel?			
2.3 Risk to Plant from:			
2.3.1 Utility failure?			
2.3.2 Equipment breakdown?			
2.3.3 Control failure?			
2.3.4 Alarm failure?			
2.3.5 Trip failure?			

Have the following potential causes of risk been considered?	Yes	No	Remarks
2.3.6 Operator error?			
2.3.7 Computer failure?			
2.3.8 Leaks?			
2.3.9 Fire?			
2.3.10 Explosion?			
2.3.11 Flood?			
2.3.12 Act of nature?			
2.3.13 Aircraft crash?			
2.3.14 War / conflict?			
2.3.15 Terrorist activity?			
2.4 Risks to Environment from:			
2.4.1 Emissions and effluents			
2.4.2 Vents and discharges to atmosphere			
2.4.3 Evaporation losses from tanks, ponds, etc.			
2.4.4 Fugitive emissions			
2.4.5 Leaks and spills			
2.4.6 Solid waste			
2.4.7 Engine Exhausts			
2.4.8 Soil pollution			
2.4.9 Offensive odor			

J-4. Considerations for Selecting Risk Reduction Measures

Have these risk reduction considerations been analyzed?	Yes	No	Remarks
1. Increase Inherent Safety			
1.1 Are there opportunities to eliminate or reduce the hazards and/or their potential consequences?			
1.2 Are the remaining hazards at a level that should be avoided?			
2 Physical Means of Risk Reduction			
2.1 Are the hazards of sufficient magnitude to require physical/engineering means of controlling risk?			
2.2 Are the hazards of sufficient magnitude to require multiple layers of physical/engineering control?			
3 Administrative Means of Risk Reduction			
3.1 What special administrative procedures are required to ensure the integrity of any necessary physical means of risk reduction?			
3.2 Can the risks be adequately controlled by the direct application of suitable formal administrative procedures?			
4 General Operating Procedures and Training			
4.1 What operating procedures are necessary to minimize the demands on any specific risk reduction measures?			
4.2 Can the risks be adequately controlled by suitably defined operating procedures and appropriate training?			
4.3 What personal protective measures (e.g. equipment and clothing) is required for personnel?			

Note 1: The table above shows a typical checklist of considerations, but it is not by any means a comprehensive checklist.

Note 2: Inherent Safety is an approach in which opportunities are sought to eliminate hazards at the source wherever possible. Where this cannot be achieved, an hierarchy of risk reduction measures are considered. The approach is most effective when applied at the earliest stages in a project, although there are cases where it has proved valuable on existing plants.

Note 3: The risk management strategy adopted has to be cost effective: if it is not, then the activity may be safe but it is unlikely to be viable. Whilst reducing risk by adopting solutions that give better inherent safety should always be a first consideration, economic factors have to govern whether or not such solutions can be adopted in practice.

The assessment procedures applied and the prime measures selected to control the risk should be as simple and cost effective as possible in relation to the level of the risk. The less the frequent the hazardous situation and the less severe the resulting consequences, the simpler can be the prime means of protection and vice versa.

J-5. Considerations for the ALARP Demonstration Process

To ensure a risk has been reduced to ALARP it is first necessary to confirm that the design meets Kenya O&G and international codes and standards, as well as Kenya regulations. It is also necessary to ensure that the risk falls in the ALARP region of Risk Matrix. If it does not, then compulsory risk reduction measures must be taken until the risk is within the tolerable (ALARP) region.

Once the risk is in the ALARP region, it is still necessary to demonstrate that the risk is tolerable and ALARP by showing, for each activity or facility or project (or at each project gate), that the following aspects have been covered:

- Efforts have been made to identify all possible hazards with the potential to cause harm
- The risk derived from each hazard has been evaluated, either qualitatively or semi-quantitatively
- The existing (or proposed) measures to reduce the risks have been identified and assessed; these measures may prevent an incident from occurring or, less preferably, mitigate to reduce the effects of an incident if it occurs
- If the existing controls do not reduce the risk to the acceptable region, further risk reduction measures are identified
- The added benefit of each risk reduction measure is assessed to determine whether it is viable or whether the benefit is grossly disproportionate to the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble)
- Once all risk reduction measures have been considered and the justification for acceptance or rejection documented, it can be shown that risks to people have been reduced to the lowest level that is reasonably practicable (tolerable and ALARP)

In practice, it is necessary to demonstrate that the sacrifice (including expenses and time and/or effort) involved in implementing a risk reduction measure (or set of risk reduction measures) would not be grossly disproportionate to the benefits achieved from the proposed risk reduction measures. It follows then that substantially more effort shall be made to reduce risks where the risk is close to the intolerable region than for risks that are judged to be closer to being broadly acceptable.

Thus, the ALARP demonstration process, provides guidance on balancing the costs and benefits of measures, and adopting measures that are not grossly disproportionate to sacrifices.

J-6. Example on the Application of the Risk Assessment and Management Matrix

Scenario:

An Oil & Gas facility discharges produced water to an onshore water body containing a harmful substance, which is moderately toxic, very persistent and has a moderate potential to bio-accumulate. The concentration of the harmful substance is regulated to a monthly average of 15 mg/l. Due to an increase of oil and gas production levels that surpass the facility's existing treatment capacity, the concentration of the harmful substance in the produced water effluent increases to a monthly average of 200 mg/l. As a result, the maximum allowable concentration of the harmful substance in the receiving aquatic environment is exceeded significantly.

During routine monitoring and investigations by the government regulatory authority, the substance is detected in low concentrations in tissues of commercial fish. The fish are deemed unsuitable for consumption. An investigation points to the effluent from the facility.

Risk Matrix:

About this matrix:

- **This risk matrix and risk tolerability criteria are endorsed for use across all Kenya O&G upstream, midstream, and downstream activities.**
- **The non-monetary severity columns (People, Environment, and Reputation) are independent of any monetary relationships and are not intended to be proportionally related to the other Consequence Severity Categories.**
- **Damage to assets includes capital loss, business interruption, production deferment, legal liability and emergency response costs.**
- **Decreasing Consequence: Negligible (lowest value 1) and Severe (highest value 5)**

Table J-3 Consequences

Categories	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
People	No injury or damage to people.	Reversible, minor employee injury not affecting work performance, requiring short term hospitalization.	Moderate irreversible impairment to one or more employees that can result in lost workdays (LTI), or restricted work.	Single employee fatality or permanent total disability to one or more employees, and some impact on third parties.	Multiple employee fatalities, and/or multiple third party fatalities.
Environment	No negative impact	Minor damage,	Limited damage	Severe damage	Persistent severe

Categories	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
	to environment.	but no lasting effect. Examples: 1-Small spill requiring short term (1-4 days) cleanup operations. 2-On-site groundwater contamination. 3-Complaints from a single family or single individual. 4-Single exceedance of statutory or other prescribed limit.	that will persist or require cleaning up. Examples: 1- Moderate complexity spill affecting only few (1 or 2) low sensitivity environmental resources and requiring more than 5 days of cleanup operations. 2-Observed off-site effects or damage, e.g. fish kill or damaged vegetation. 3-Off-site groundwater contamination. 4-Complaints from community organizations. 5-Frequent exceedance of statutory or other prescribed limit, with potential long term effect.	that will require extensive measures to restore beneficial uses of the environment. Examples: 1- Major, complex or compound incidents that impact any high sensitivity environmental resource. 2-Off-site groundwater contamination over an extensive area. 3-Many complaints from community organizations or local authorities. 4-Extended exceedances of statutory or other prescribed limits, with potential long term effects.	damage that will lead to loss of commercial, recreational use or loss of natural resources over a wide area. Examples: 1-Any Major, complex or compound incidents that impact more than one high sensitivity environmental resource and requires extensive clean-up and remediation measures.
Assets	Slight damage and/or operational impact with costs up to US$ 1.0 million	Minor damage and/or operational impact with costs between US$ 1.0 and 15 million	Partial damage and/or operational impact with costs between US$ 15 and 30 million	Major damage and/or operational impact with costs between US$ 30 and 140 million	Significant damage and/or operational impact with costs above US$ 140 million, e.g. total loss of a facility.
Reputation	Minor, adverse local public and media attention	Attention from media; heightened concern by local community	Criticism by a Province government	Significant adverse national media or public or national government attention	International public or media attention, with potentially severe impact

Table J-4 Frequency Estimation

Frequency Category	Qualitative Interpretation Guidance	Quantitative Interpretation Guidance (yr^{-1})
A	**Very Unlikely**. • Has happened once, or not at all in Kenya O&G • Has happened a few times, or not at all in O&G Industry	Less than E-05
B	**Unlikely**. • Similar event may occur once in 50-100 years at one of Kenya O&G assets. • Have been isolated occurrences in Kenya O&G or has happened several times in the O&G Industry.	Between E-05 and E-04
C	**Possible**. • Similar event may occur once in 10 to 50 years at one of Kenya O&G assets. • Has not happened before at the Asset or has happened a few times in Kenya O&G..	Between E-04 and E-03
D	**Likely**. • Similar event may occur at Asset every 10 to 50 years. • Has happened once before at the Asset, or several times in Kenya O&G.	Between E-03 and E-02
E	**Frequent**. • Similar event may occur at Asset every 1 to 10 years. • Has happened several times at Asset, or many times in Kenya O&G	Greater than E-01

Table J-5. Risk Matrix, and Risk Tolerability Criteria

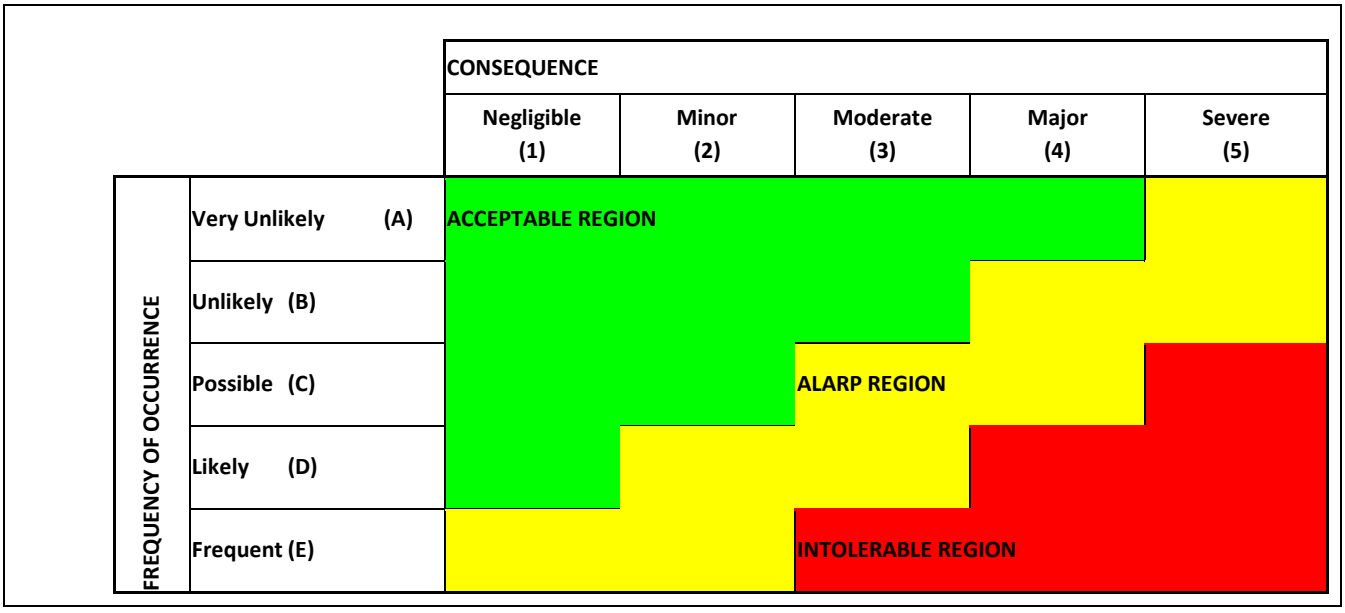


Table J-6. Criteria for Risk Management

Risk Category	Risk Management Regime
Intolerable Region	The activity shall not be carried out, as the risk is intolerable/unacceptable. Adequate control measures shall be established (regardless of cost-benefit considerations, i.e. compulsory) to bring the risk levels to at least "ALARP" before the activity can be performed. Such additional control measures must be in place before the activity can commence.
ALARP Region	The risk of the activity shall only be deemed as tolerable once it is demonstrated that all reasonably practicable risk reduction measures have been implemented, or if risk reduction is impracticable, or the cost of the risk reduction measures is grossly disproportionate to the improvement gained. The activity shall be further analysed to determine if any additional control measures are required. If required, such additional control measures shall be established before the activity can be performed.
Acceptable Region	The risk is acceptable. No additional control measures will be required.

Risk Assessment:

As the discharge occurs for extended time periods, it is deemed to have resulted in continual environmental impact and contamination to existing local fish species (frequency E). There are precedents of massive liability claims that have been filed against O&G operators due to similar environmental impacts, and also have resulted in significant damage to the international reputation of those O&G Companies.

Consequently, the following risk classification is proposed:

- Environment: E4 **(Intolerable, see table 1 and matrix below)**
- Reputation: C5 **(Intolerable, see table 1 and matrix below)**
- Assets: C4 **(ALARP, see table 1 and matrix below)**

The risk is classified as intolerable

Incident Investigation:

EPRA in coordination with the NCP lead agency (KMA or NEMA) personnel are charged to conduct the investigation and follow-up of the incident.

Risk Management:

Production of O&G at the facility shall be stopped or reduced to levels that do not surpass treatment capacity of the produced water and exceedance of the harmful substance discharge limit, as the risk is intolerable. Adequate control measures shall be established to bring the risk levels to at least “ALARP”. Such additional control measures must be in place before restarting full O&G production.

Communication and Monitoring:

The incident should be immediately reported to the Energy and Petroleum Regulatory Authority and NEMA as it had an actual level 4 environmental consequence. Additionally, the incident as well as the Risk Assessment & Management (RA&M) process shall be adequately recorded and implementation of risk reduction measures fully documented and monitored.