Australian Government
Australian Maritime Safety Authority

Technical guidelines for preparing contingency plans for

MARINE AND COASTAL FACILITIES

Contents

1. Introduction

This Guideline provides a generic best practice approach to marine pollution contingency planning process across all industries and sectors. It does not purport to provide definitive instructions for any particular site or activity to meet the regulatory or legislative requirements specific to those circumstances.

Operators should apply their own best judgment in following the advice and processes outlined within these technical guidelines.

1.1 Purpose of this Guideline

This Guideline is intended to provide clear technical guidance to the operators of marine and coastal facilities for the preparation of marine pollution contingency plans and for establishing and maintaining an effective response capability.

The Guideline details the information requirements and methods of analysis required to develop, document and implement effective marine pollution response operations.

Specifically the Guideline outlines a staged approach to contingency planning based upon:

- **Risk assessment:** *A complete assessment of the marine pollution risk(s) associated with a particular facility or operational activity. This includes:*
  - *Identification of possible spill scenarios (incidents, probabilities, spill volumes and oil or HNS types)*
  - *Identification of resources that could be impacted, their sensitivity and value.*
  - *Conditions under which impact could occur.*
  - *Potential effects and the significance of those effects.*
- **Response strategies:** *The development and implementation of response strategies designed to address each risk. These should be based on identified priorities derived from the risk assessment.*
- **Response capability:** *The provision of the necessary response resources; response equipment and trained personnel.*
- **Documentation:** *The development of clear and agreed documentation of incident management systems, organisation and procedures within an agreed Marine Pollution Contingency Plan (MPCP).*
- **Maintenance:** *The development and implementation of a management system for the ongoing maintenance of the contingency plan and the response capability (physical and human resources).*

1.2 Scope of the Guideline

The Guideline addresses response planning for spills of oil and hazardous and noxious substances (referred to as chemicals within this Guideline), as defined by the International Convention on Oil Pollution Preparedness, Response and Cooperation 1990 (OPRC 90) and the 2000 Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances (HNS Protocol).

The Guideline can be applied to both fixed facilities and temporary activities which pose marine pollution risks, including:

- *Ports and coastal oil and chemical facilities*
- *Marine transport of oil and chemicals*

- *Offshore oil and gas production facilities*
- *Offshore oil and gas exploration and development operations.*

1.3 Planning and risk management principles

The Guideline applies four principles of planning and risk management to marine pollution management.

- **Proportionality** – *the level of preparedness and response capacity should reflect the risk posed.*
- **Planning** – *having sufficient documents, organisation and resources to manage the identified risks.*
- **Preparedness** – *possessing the ability to implement the response systems as identified in response plans and other documents.*
- **Performance management** – *monitoring, testing and exercising, reviewing and revising the implemented system.*

These will be referred to throughout the Guideline to assist in developing and implementing a marine pollution response capability for a facility and/or operation that reflects the calculated risks posed by that facility and/or operation.

The Guideline does not impose or identify minimum response standards (equipment or personnel) or prescribe performance requirements, but specifically provides guidance on:

- *The identification of agreed response objectives and priorities.*
- *The development of appropriate and effective response strategies to achieve those objectives.*
- *The provision of sufficient systems and resources to implement the agreed response strategies.*

1.4 Terminology

There is little consistency across the titles of spill preparedness and response documentation and there are a number of terms used both nationally and internationally. For example, OPRC 90 refers to "Oil Pollution Emergency Plans", whilst the most common term within Australian regulation is "Oil Spill Contingency Plan".

This Guideline employs the generic term Marine Pollution Contingency Plan (MPCP) to reflect the possible requirement to plan for all sources of marine pollution, both oil and chemicals. Some risks may be created by synthetic or non-petroleum-derived oils. Although often not as intrinsically toxic as petroleum oils, these can still pose threats to natural resources, such as birds. Best practice would see these risks included in a MPCP, if they exist, even if not required by law.

*In line with good regulatory practice, this best practice Guideline avoids using the words "***shall***" and "***must***" as these imply a regulatory requirement, and that it is not the purpose or function of this document. As much as possible, this document uses the words "***should***", "***could***" and "***may***" to indicate a hierarchy of best practice application. Many processes and components of MPCPs identified in this document are be required by various regulators: it is the responsibility of the operator to know what regulatory requirements they must meet and how these should be addressed in their plans and processes.*

> **Note** – *This Guideline does not require the term Marine Pollution Contingency Plan to be employed by a company or agency when developing response plans. Rather, it is expected that the term which most accurately reflects the scope and purpose of the plan should be used.*

A glossary of terms and acronyms are provided in Appendix A.

2. The contingency planning process

This section outlines the process and general information requirements for the identification and the assessment of marine pollution risks and the development of a response plan and capability for a facility or operation.

2.1 Eight steps to prepare a marine pollution contingency plan

The marine pollution response capability for a facility or operation is determined through a well-structured and documented risk assessment process. The process summarised below is consistent with the AS ISO 31000:2018 Risk management — Guidelines.

2.1.1 Risk assessment and planning

STEP 1 – Establish the Context (Guideline Section 3)

The operator should define the scope, regulatory, administrative and organisational context within which the MPCP will function. The context should include consideration of:

a. Regulatory environment, including applicable legislation and regulation, permit conditions and relevant international conventions and agreements.

b. Administrative arrangements, including the National Plan for Maritime Environmental Emergencies (the National Plan) arrangements, State and Territory marine oil spill or disaster management arrangements and any other associated contingency plans.

c. Organisational environment, including decision-making structures and approval processes, procurement requirements etc.

d. Stakeholders, including government agencies (Local, State and Commonwealth), community groups, response support agencies, etc.

STEP 2 – Risk Identification (Guideline Section 4)

The operator should identify the specific risks associated with the facility or operation, including:

a. Identification of the full range of possible incidents that could occur, e.g. vessel grounding, blowout etc.

b. Identification of the full range of possible pollutants that could be released as a result of the incident, e.g. fuel oil, crude oil, condensate, liquid chemicals, gases, lubricants, etc.

c. Assessment of the maximum likely spill volume, maximum credible spill volume and most likely spill volume (see Table 9).

STEP 3 – Risk Assessment (Guideline Section 5)

The operator should formally assess the marine pollution risks associated with the facility and operation, including:

a. Identification of the area over which environmental impacts will potentially occur for each spillscenario, referred to as the Zone of Potential Impact (ZPI).

b. Assessment of the likely impacts to environmental and socio-economic resources resulting from each spill scenario.

STEP 4 – Risk Treatment (Guideline Section 6)

The operator should select response strategies to prevent or reduce the likely impacts to environmental and socio-economic resources resulting from each response scenario. This should include:

a. Identification of the area over which response operations are able to be effectively conducted.

b. Establishment of response objectives and protection priorities.

c. Evaluation and selection of response strategies to achieve each of the response objectives and protection priorities.

2.1.2 Implementation of the response capability

STEP 5 – Implementation (Guideline Section 6)

The operator should implement the selected response strategies. This includes:

a. Identification and evaluation of the resource requirements to undertake the identified response strategies.

b. Procurement of resources.

c. Establishment of training arrangements to support the response capability.

STEP 6 – Documentation (Guideline Section 7)

The response capability should be documented within a MPCP. The MPCP should include:

a. A description of the incident management arrangements, including command and control.

b. Response procedures and processes, including activation and notification arrangement, planning processes, reporting and operational management.

c. Response strategies and resourcing, including equipment listings etc.

2.1.3 Maintaining the response capability

STEP 7 – Maintenance of the MPCP (Guideline Section 8)

The operator should document how the response capability will be maintained, including:

a. Maintenance arrangements for equipment.

b. Training programs.

c. Exercising programs.

d. Auditing of response capability.

STEP 8 – Review (Guideline Section 8)

The operator should document the process for review of the MPCP and the response capability, including:

a. Periodic review of the risk assessment.

b. Formal after action reviews following exercises or incidents.

2.2 Documentation

The process outlined at section 2.1 above, can be documented in a number of reports and should be reflected in the MPCP. Where information is not held within the MPCP, e.g. for reason of commercial in confidence, the source of the data used to develop the response strategies should be cited and provided to the relevant approval or review bodies. As MPCPs are developed in conjunction with stakeholders and address risks of public interest, best practice would strongly suggest that a MPCP be publicly accessible. This is often the case in the maritime sector.

Other documents that may need to be considered in developing a MPCP include:

- *Environmental Management Plan or other environmental impact documentation.*
- *Blowout management plans.*
- *Emergency response plans, particularly for chemicals or other hazardous materials.*
- *Risk assessments.*
- *Crisis management plans.*
- *Emergency finance procedures.*
- *Contracts or other arrangements with OSR support agencies or companies.*

2.3 Approval

Operators should be aware of all formal regulatory or legislative approvals required for their MPCPs and/ or associated documents, as part of Commonwealth and State/NT maritime, local and offshore regulatory regimes.

Best practice strongly suggests that any MPCP should be approved by the operator company's CEO, senior executive group or board of directors, in recognition of its importance to safe and clean operations.

3. Establishing the planning context

The operator should identify the internal and external requirements to be considered when developing its MPCP and response capability. This should include consideration of:

- *Jurisdiction*
- *Relevant international conventions*
- *Legislation and Regulation*
- *Administrative arrangements and agreements, including integration with other plans*
- *Company policy and organisational structure*
- *Stakeholders.*

3.1 National Jurisdictions

Table 1 outlines the roles and responsibilities for Australian statutory authorities, control agencies and operators, depending on spill location and source. See also section 3.4 below National management arrangements.

Table 1 - Control Agencies for oil pollution incidents

<table>
<tr><th rowspan="2">Area source</th><th rowspan="2">Oil terminal</th><th rowspan="2">Sole-user maritime facility for oil terminal</th><th rowspan="2">Multi-user maritime facility</th><th rowspan="2">Port waters</th><th rowspan="2">State waters</th><th colspan="2">Commonwealth waters</th></tr>
<tr><th>Shipping sourced spill</th><th>Offshore petroleum facility</th></tr>
<tr><td>First Strike / Level 1</td><td>Oil terminal operator</td><td>Oil terminal operator</td><td>Maritime facility owner</td><td rowspan="2">Port authority
Or
State govt agency</td><td rowspan="2">Offshore petroleum facility titleholder
Or
state govt agency</td><td rowspan="2">AMSA</td><td rowspan="2">Titleholder</td></tr>
<tr><td>Levels 2 and 3</td><td>Port authority
Or
State govt agency</td><td>Port authority
Or
State govt agency</td><td>Port authority
Or
State govt agency</td></tr>
<tr><td colspan="8">Great Barrier Reef Marine Park – for any spills the control Agency is the Queensland Government</td></tr>
<tr><td colspan="8">Torres Strait – for any spills into the area defined within TorresPlan the Control Agency is the Queensland Government</td></tr>
<tr><td colspan="8">External territories:
• for any spills into Christmas Island ports area the Harbour Master is the Incident Controller
• for any spills into Commonwealth waters around Christmas Island, the Incident controller is appointed by AMSA
• for spills into Norfolk Island Waters, the control Agency is the Norfolk Island Government</td></tr>
</table>

Notes relating to Table 1

To avoid uncertainty, a vessel at a Maritime Facility with a line ashore is subject to the relevant Control Agency arrangements indicated for a Maritime Facility and not the arrangements indicated for Port Waters.

Definitions – for Table 1 only

First strike *means a prompt initial response to protect the environment that is intended to limit the effect of an incident until such time as the resources can be deployed in support. This capability may vary from location to location.*

Oil terminal *means a petroleum refinery and/or petroleum storage/distribution facilities with access to a maritime facility, but not including the maritime facility.*

Maritime Facility *means a wharf or mooring at which a vessel can be tied up during the process of loading or unloading a cargo [or passengers]. A maritime berth may be a sole user berth [such as a dedicated berth for an oil refinery] or may be a multi-user berth [such as a berth that handles general cargo, or one that handles bulk liquids such as petroleum for more than one user of the berth (sometimes known as a common-user berth)].*

Oil terminal operator *means a company [or joint venture] that operates an oil terminal.*

Port waters *has the same meaning as in s.12 of the Maritime Transport and Offshore Facilities Security Act 2003 and includes:*

a. *areas, of water, between the land of the port and the open waters outside the port, intended for use by ships to gain access to loading, unloading or other land based facilities; and*
b. *areas of open water intended for anchoring or otherwise holding ships before they enter areas of water described in paragraph (a); and*
c. *areas of open water between the areas of water described in paragraphs (a) and (b).*

3.2 International conventions and agreements

A number of international conventions and agreements should be considered in the preparation of a Marine Pollution Contingency Plan (MPCP) and supporting documents. These are listed in Table 2.

3.2.1 OPRC 90 and HNS Protocol

The International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) was adopted by the International Maritime Organization (IMO) in 1990. Australia was one of the first countries to adopt the Convention and is also a party to the 2000 Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances.

Article 3 of the OPRC Convention sets down a requirement for all operators of offshore installations to have in place an "Oil Pollution Emergency Plan (OPEP)" approved by a competent national authority, which is compatible with that State's National Contingency Plan. As noted in section 1.4, OPEPs are referred to in this Guideline by the generic title of Marine Pollution Contingency Plans (MPCPs) and the relevant national contingency plan is The National Plan for Maritime Environmental Emergencies (the National Plan). The National Plan implements many of Australia's obligations as a signatory to the Convention.

Parties to the OPRC Convention are required to establish these measures for dealing with pollution incidents, either nationally or in cooperation with other countries.

Table 2 - International Conventions and Agreements relating to oil spill and response

International convention	Application to the National Plan
International Convention on Oil Pollution Preparedness, response and Co-operation, 1990 Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)	Provide the basis for the National Plan by setting the context for: • developing a national system for pollution response • maintaining adequate capacity and resources to address oil and hazardous and noxious substances (HNS) incidents • facilitating international cooperation and mutual assistance in preparing for and responding to major and HNS incidents, and • notifying without delay all States [neighboring countries] whose interests are affected or likely to affected by an oil or HNS pollution incident.
International Convention for the Prevention of Pollution from Ships (MARPOL)	Provides ships' construction and operational requirements to prevent pollution from ships. Requires ships greater than 400 gross tonnes to have pollution emergency plans. Provides for exemptions from discharge restrictions (and prosecution) where: • a discharge is necessary to secure the safety of a ship or save a life at sea, or prevent a larger spill; or • it is necessary during a spill response to discharge oil or HNS or use dispersants to minimize the overall • damage from pollution and is approved by the relevant government.
United Nations Convention on the Law of the Sea, 1982	Article 221, provides general powers for parties to take and enforce measures beyond the territorial sea to protect their coastline or related interests from pollution or threat of pollution following a maritime casualty or acts relating to such a casualty, which may reasonably be expected to result in major harmful consequences. Article 198 provides that "when a State [neighbouring country] becomes aware of cases in which the marine environment is in imminent danger of being damaged … by pollution, it shall immediately notify other States it deems likely to be affected by such damage."
International Convention Relating to Intervention on the High Sea in Cases of Oil Pollution Casualties, 1969 Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other Than Oil, 1973	Provides general powers for parties to take measures on the high seas as may be necessary to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from the threat of pollution by oil or hazardous and noxious substances following a maritime casualty or acts related to such a casualty, which may reasonably be expected to result in major harmful consequences.
International Convention on Civil Liability for Oil Pollution Damage, 1992 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 2003 Protocol to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992	Provides for the recovery of pollution costs and payment of compensation from owners/operators of oil tankers. Provides for additional compensation and costs where the tanker owners'/ operators' liability limits are exceeded, using funds provided by the oil industry.
International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001	Provides for the recovery of pollution costs and payment of compensation from owners/operators of all vessels using oil as bunker fuel and references the liability arrangements in the Convention on Limitation of Liability for Maritime Claims, 1976 (LLMC) and its 1996 Protocol.
Protocol on Environmental Protection to the Antarctic Treaty 1991	The objective of the Protocol is to ensure the comprehensive protection of the Antarctic environment and associated ecosystems. The Antarctic includes all the area south of latitude 60o south. Annex IV to the Protocol relates to marine pollution, specifically prohibiting the discharge of oil, noxious liquid substances and garbage in the Antarctic Treaty area. Annex VI (not yet in force) of the Protocol relates to liability for environmental emergencies.

Table 3 - MARPOL 73/78 Categories of Noxious Liquid Substances Carried in Bulk

Substance Category	Noxious liquid substances which, if discharged into the sea from tank cleaning or de-ballasting operations are deemed to:
X	present a major hazard to either marine resources or human health and, therefore, justify the prohibition of discharge into the marine environment.
Y	present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment.
Z	present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment.
OS	Other substances which have been evaluated and found to fall outside Category X, Y or Z because they are considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning of de-ballasting operations. The discharges of bilge or ballast water or other residues or mixtures containing these substances are not subject to any requirements of MARPOL Annex II.

3.2.2 MARPOL 73/78

MARPOL 73/78 is the main International Convention covering prevention of pollution of the marine environment by ships from operational or accidental causes and contains Annexes related to different kinds of pollution.

Annex I requires that ships over 400 gross tonnage and oil tankers over 150 GT carry a Shipboard Oil Pollution Emergency Plan (SOPEP) and that this should be approved by the relevant national administration.

Annex II deals with the control of pollution by noxious liquid substances in bulk by ships over 150 gross tonnes. It details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. These ships must also carry an approved Shipboard Marine Pollution Plan for Noxious Liquid Substances (SMPPNLS). Annex II grades noxious liquid substances into categories graded according to the hazard they present to marine resources, human health or amenities (Table 3 above).

3.2.3 GESAMP hazard profiles list

The IMO's Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) through the GESAMP Working Group on the Environmental Hazards of Harmful Substances (EHS) has also produced a hazard profiles list (Composite List), which classifies and lists substances according to their potential for bio- accumulation; bio-degradation; acute toxicity; chronic toxicity; long-term health effects; and effects on marine wildlife and on benthic habitats. This list is available on the GESAMP website.

3.2.4 Bonn Agreement

Although the Bonn Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances, 1983 applies only to the North Sea, the thirteenth Australian National Plan OperationsGroup meeting adopted the Bonn Agreement Oil Appearance Code (BAOAC) as the standard method for assessing the volume of oil on water for the purposes of response and prosecution.

The Bonn Agreement on Oil Appearance Code is explained in Annex A of the Bonn Agreement Aerial Surveillance Handbook 2004 which can be downloaded from the Bonn Agreement website.

3.2.5 Other potentially relevant international agreements

Other conventions and agreements may also apply in regards to identifying sensitive resources and consequent response priorities.

Australia is party to international conventions requiring protection of wetlands of significance or migratory birds and associated habitat including:

- *Ramsar Convention, 1971*
- *China Australia Migratory Birds Agreement (CAMBA), 1986*
- *Japan Australia Migratory Birds Agreement (JAMBA). 1974.*
- *www.austlii.edu.au/au/other/dfat/treaties/1981/6.html*
- *Republic of Korea Australia Migratory Birds Agreement (ROKAMBA), 2006.*

The Antarctic Treaty, 1959, and Antarctic Treaty System also provides for protection of the Antarctic environment and conservation of plants and animals. This should also be considered in the development of plans relating to this region. The Madrid Protocol on Environmental Protection, 1991, specifically requires the development of contingency plans to respond to environmental emergencies.

3.3 Legislation and regulation

A number of Acts and subordinate legislation must be considered in the preparation of a MPCP and supporting documents. It should be noted that not all are relevant to every facility or operation and it is up to the operator to determine which are relevant to their operation and/or MPCP.

Table 4 - Commonwealth Legislation

Commonwealth legislation	Application to the National Plan
Australian Maritime Safety Authority Act 1990	Provides that a function of AMSA is to combat pollution in the marine environment.
Protection of the Sea (Prevention of Pollution from Ships) Act 1983	Provides exemptions for the discharge of materials in response to marine pollution incidents, e.g. including also the application of dispersants. Requires ships greater than 400 gross tonnes to have pollution emergency plans. Provides for emergency discharges from ships.
Protection of the Sea (Civil Liability for Bunker Oil Pollution Damage) Act 2008	Places liability on shipowner for pollution damage caused by loss of bunker fuel. Provides immunity from legal action for response personnel.
Protection of the Sea (Civil Liability) Act 1981	Places liability on shipowner for pollution damage caused by loss of persistent oil from an oil tanker.
Protection of the Sea (Oil Pollution Compensation Fund) Act 1993	Provides additional compensation for pollution damage caused by loss of persistent oil from an oil tanker.
Protection of the Sea (Powers of Intervention) Act 1981	Provides for intervention powers being exercised in Australia's EEZ, Territorial Sea and internal waters.

Commonwealth legislation	Application to the National Plan
Offshore Petroleum and Greenhouse Gas Storage Act 2006	Sets out the requirements for the offshore petroleum exploration and production sector. Provides for the Commonwealth to direct the polluter to take actions in response to an incident and to clean-up, monitor impacts and reimburse National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) or the Commonwealth.
Environment Protection and Biodiversity Conservation Act 1999	Regulates activities impacting on defined "matters of national environmental significance", Commonwealth marine reserves, and species listed under the Act. The Act provides for the making of exemptions if in the national interest. An exemption has been issued for activities done pursuant to the National Plan.
Great Barrier Reef Marine Park Authority Act 1975	Provides for permission to use dispersants in the Marine Park, and notification to enter a zone in the Marine Park for the purpose of salvage.
Antarctic Treaty (Environment Protection) Act 1980	Provides for the protection of the Antarctic environment, including requiring all activities in the Antarctic to undertake an environmental impact assessment and establishing specific permitting arrangements for impacts on native flora and fauna. The Act provides exceptions for activities done in an emergency, including to protect the environment. When in force, Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty will be implemented through this Act, including requirements for operators to undertake preventative measures and develop contingency plans in relation to environmental emergencies, and establish a liability regime for failing to respond to environmental emergencies in the Antarctic.
Fisheries Management Act 1991	Provides regulatory and other mechanisms to support any necessary fisheries management decisions during a response.
Maritime Powers Act 2013	Provides for the administration and enforcement of Australian laws in maritime areas, and for related purposes. The Act aims to give greater certainty to the maritime Officers working in difficult conditions to protect Australia's boarders and enforce Australian Maritime laws.

3.4 National Plan management arrangements

3.4.1 The National Plan

The National Plan sets out the agreed policy for the implementation of management arrangements for maritime environmental emergencies within Australia. The National Plan is underpinned by:

- **policies** – *implementing documents for the strategic management of the National Plan, e.g. National Plan Governance Guideline*
- **guidelines** – *documents providing guidance for the application of specific response arrangements detailed within the National Plan, e.g. Guideline for the Activation of the Fixed Wing Aerial Dispersant Capability, and*
- **scientific, technical and operational advisories** – *advisory documents on specific technical issues, e.g. National Plan Response Phase Monitoring Advisory. Under the National Plan governance arrangements the NPSCC is responsible for the review and acceptance of these documents.*

3.4.2 State and Northern Territory contingency plans

The National Plan arrangements are implemented within the States and Northern Territory (NT) through State/NT contingency plans. A number of these plans are directly linked to State/NT disaster management arrangements which assign specific roles and responsibilities to government agencies. These arrangements should be understood and integrated into the incident management arrangements established within the MPCP. This may also include relevant legislative delegations, with certain powers and functions only being able to be undertaken or implemented by agencies or individuals as a delegate of the relevant State/NT Minister.

3.5 Stakeholders

Stakeholders are people, groups and organisations with a range of interests in development of, adoption of and the successful implementation of the MPCP. They often have community or regulatory interests in the risks and values the MPCP is seeking to address. They could also have an operational interest in or part to play in the application of the response system.

Hence, the identification of and engagement with stakeholder groups is crucial to adopting best practice in the development of MPCPs. Operators should identify stakeholders relevant to their plan, (e.g. operational, regulatory, community), engage with them in an open and meaningful manner, and document the consultation process.

Where a stakeholder has a clear operational role under the plan, the operator should seek formal agreement to the contingency plan including preparedness and response management arrangements and response strategies. Without such an agreement it cannot be assumed that the stakeholders have a commitment to the plan or its implementation.

4. Identifying the potential risk scenarios

This section provides guidance to operators with regard to the identification of potential spill risks, including the spill scenario, products and volumes.

4.1 Defining the risk scenarios

- *Worst case scenario*
- *Maximum credible case scenario*
- *Most likely case scenario*

Clear understanding of each scenario is required for the effective development of an MPCP.

Note: *This Guideline recommends that operators plan for the worst case scenario volume, but use the maximum credible case scenario volume for determining the overall resource levels for response capability to be provided for by the operator. On-site response capabilities should reflect the most likely case scenario volume.*

Table 5 - Definition of spill volume terms and guidance for determining volumes

Spill Volume Term	Definition and Guidance
Worst Case Spill (WCS)	• The largest volume that could be spilled as a result of any event or combination of events. Generally, the WCS at sea does not make allowance for spill prevention, control or other mitigation methods. The results of a catastrophic event or failure.
Other Indicators	• For vessels, total volume (cargo, fuel and operational). • For storage tanks, the total volume of all tanks within a single bund or enclosure. Note: Failure of the bund or other containment need not be assumed in calculating the possible volume released to the environment. • Largest volume from an incident with a calculated return frequency of >1000 years. • Spills of this magnitude will generally require a Level 2 or Level 3 response.
Maximum Credible Spill (MCS)	• The largest spill that is considered possible given the spill prevention, control and other mitigation methods in place. Generally, the WCS assumes a failure of one or two levels of spill prevention or control.
Other Indicators	• Largest spill volume known to have occurred based on recent (50 year) data. • Largest volume from an incident with a calculated return frequency of <1000 years. • These spills may be: – **Level 1 Incidents** are generally able to be resolved through the application of local or initial resources only (e.g. first-strike capacity) – **Level 2 Incidents** are more complex in size, duration, resource management and risk and may require deployment of jurisdiction resources beyond the initial response – **Level 3 Incidents** are generally characterised by a degree of complexity that requires the Incident Controller to delegate all incident management functions to focus on strategic leadership and response coordination and may be supported by national and international resources.
Most Likely Spill (MLS)	• The most likely spill over 10m³ for the facility or activity. The largest spill likely to occur within the life span of the facility and/or activity.
Other Indicators	• The most frequent spill volume over 10 tonnes based on recent (100 year) data. • Largest volume from an incident with a calculated return frequency of no more than 100 years. • Operator (Level 1) resources should be sufficient to contain and recover, or otherwise treat spills (as set out in the Marine Pollution Response Plan) of this size.

4.2 Identifying the potential spill scenarios

Operators should identify and describe all the potential spill scenarios associated with the facility and/or operation(s). Not all may end up in the MPCP as smaller ones may be included within larger ones. These may include, but need not be limited to, the scenarios outlined at Table 6.

Table 6 - Possible spill scenarios

Incident Type	General Shipping	Ports & Port Facilities	Oil Loading & Offloading Facilities	Offshore Exploration	Offshore Production
Vessel -Collision	Yes	Yes	Yes	Yes	Yes
Vessel -Grounding	Yes	Yes	Yes	Yes	Yes
Vessel – Transfer/Bunkering	Yes	Yes	Dep	Yes	Yes
Vessel – Tanker Loading/ Offloading	N/A	N/A	Yes	N/A	Dep
Pipeline Failure	N/A	N/A	Dep	N/A	Yes
Structural Failure	Yes	N/A	Yes	Yes	Yes
Surface Blowout	N/A	N/A	N/A	Yes	Yes
Subsurface Blowout	N/A	N/A	N/A	Yes	Yes

Yes - Possible incident scenario for the facility or operation.

Dep - Possible incident scenario dependent on the nature of the facility or operation.

N/A - Not usually relevant to the facility or operation.

4.3 Identification of potential pollutants

Facility and vessel operators should maintain an inventory of the oils and chemicals present on or produced by, their facilities, operations or vessels. The chemical and physical character of oils and chemicals determines their behaviour in water and air, their risk profile and the strategies and actions that may be safeand effective in a spill response. Often, insufficient attention is paid in MPCPs to the characterisation of pollutants and their behaviour, which can lead to greater safety and environmental risks.

Hydrocarbon products should be analysed to determine their physical and chemical properties and classified in terms of their persistence. The analysis process is outlined in Table 7 and the classification of oils is outlined in Table 8 and of chemicals in Table 9.

Table 7 - Chemical and physical parameters to be determined through laboratory analysis

Parameter	Method(s)[1]	Reason for Analysis
Wax content (% weight)	ASTM D2887	Needed for predicting oil behaviour and volume of potential residues
Distillation profile	ASTM D2887 ASTM D7169 ASTM D3710	
Asphaltene content (% weight)	MA-1221	Assists in prediction of emulsification potential
Total Volatile Organic Compounds (VOC)	Wang, et. al., 1995	Health and safety and environmental risk assessment. Benzene, ethylbenzene, toluene and xylenes (BTEX) are harmful to responders and to the receiving environment.
PAH (total and detailed) GC/ MS	USEPA 8270C	Environmental effects assessment
C17/Pristane ratios and C18/ Phytane ratios	MA-30	Assists in fingerprinting of oils and also in determining weathering state
Aliphatic hydrocarbons	TPHCWG	Fingerprinting
Volatiles	ASTM D2887	Input to oil behaviour and trajectory models
Density (Specific Gravity) at 4°C (40°F) and 15°C (60°F)	ASTM D1298	An indicator of volatility
Viscosity (cSt) at likely ambient temperatures and at 40°C (104°F)	ASTM D445 or ASTM D4486	Assessment of likely effectiveness of dispersant, and of pumps
Pour Point (°C)	ASTM D97	High pour point oils may be solid or semi-solid at ambient temperatures, i.e. if ambient temperatures are below or close to their pour point.
Flash Point (°C)	ASTM D93 (IP34) ASTM D56 (IP304) ASTM D92 (IP36)	Safety during response
Spreading Coefficient	ASTM D 9712	The area of a slick at a given time is useful in determining slick thickness and hence the encounter rates of booms and dispersant spraying

1. *Test methods will depend on oil group or character or HNS character.*
2. *Spreading Coefficient = S_{WA} - S_{OA} - S_{WO}. S_{WA} is water/air interfacial tension, S_{OA} is oil/air interfacial tension, and S_{WO} is water/oil interfacial tension.*

Table 8 - Classification of Petroleum Based Oils

Oil Classification	Oil Description		Specific Gravity	%BP (<200°C)	%BP (>370°C)	Examples
Group I	Non-persistent oil[1]		<0.8 (API >45)	50 -100	<5	Motor spirit, Condensates
Group II	Persistent Oils	Light	0.8-0.85 (API 35-45)	19-48 (Ave = 33)	12-50[2]	Light crudes, Kerosenes, Diesel
Group III		Medium	0.85-0.95 (API 17.5-35)	14-34 Ave = 22)	28-50[2]	Marine diesel, Medium crudes
Group IV		Heavy	0.95-1.0 (API <17.5)	3-24 (Ave = 10)	33-92[2]	Heavy fuel oils
Group V		HTW[3]	>1.0 (API <10)	Low	High	Residual Fuel Oils Asphalts Orimulsion

Compiled from various IMO, ITOPF, US EPA and US Coastguard publications.

1. *"Non-persistent" oil is defined as any petroleum based oil which consists of hydrocarbon fractions where: (a) at least 50% of by volume, distils at a temperature of 340°C (645oF) and (b) at least 95% by volume, distils at a temperature of 370°C (700°F) when tested by the ASTM Method D86/78.*

2. *Indicative only. Non persistent oils are defined according to Specific Gravity.*

3. *Heavier than water oils. These vary in formulation.*

Chemicals should be classified according to Table 8 and, if applicable, the International Maritime Dangerous Goods (IMDG) Code requirements should be noted. Chemicals should also be considered in terms of the IMO joint Group of Experts on the Scientific Aspects of Marine Environment Protection (GESAMP) / Environmental Hazards of Harmful Substances (EHS) working group's Composite List (refer section 3.2.3)

With regard to chemicals it should be noted that:

- *Chemical spills may be addressed within an Emergency Response Plan, however this approach should be clearly documented within the MPCP.*
- *All plans should include relevant safety procedures.*
- *The behaviour of spilled chemicals should be considered when commissioning spill trajectory modelling for environmental assessment and/or marine pollution contingency planning.*
- *The behaviour of chemicals should be evaluated in consideration of anticipated ambient conditions.*

Table 9 - Classification of hazardous and noxious substances according to environmental behaviour

Group Designation			Properties & Behaviour	Examples	Distribution / Spread
Primary	**Secondary**	**Code**			
Evaporating Immediately (Gas)	Gas	G	Gas at ambient temperatures	Propane, Butane, Vinyl chloride	Air
	Gas/ Dissolves*	GD	Gas. May dissolve if released into water column	Vinyl Chloride Monomer (VCM), Ammonia	Air Water column
Evaporating Rapidly	Evaporates	E	Not persistent on the water surface under ambient conditions	Benzene, Some condensates, Light naphthas	Air
	Evaporates/ Dissolves*	ED	Not persistent on surface unlikely to dissolve to significant extent unless released below the surface	Vinyl acetate Methyl-t-butyl ether	Air Water column
Floating	Floats/ Evaporates	FE	On surface for significant time. Hazardous vapours	Most condensates Toluene, Xylene, Naphthas	Water surface Sea floor
	Floats/ Evaporates/ Dissolves*	FED	On surface for significant time. Possible hazardous vapours	Butyl-acetate, Isobutanol, Ethyl acrylate	Air Water surface Water column
	Floats	F	Persistent on the water surface	Oils (animal, plant and mineral)	Water surface
	Floats/ Dissolves*	FD	May persist on surface in calm conditions	Butanol, Butyl acrylate	Water surface Water column
Dissolving	Dissolves*/ Evaporates	DE	May persist on surface in calm, cool conditions. Hazardous vapours	Acetone, Propylene oxide, Monoethylamine	Air Water column
	Dissolves* Rapidly	D	Enters water column rapidly. Not persistent on water surface	Some acids, caustics and alcohols	Water column
Sinking	Sinks/ Dissolves*	SD	May be persistent on seafloor	Dichlomethane, 1,2dichloroethane	Water column Sea floor
	Sinks	S	Potentially persistent on seafloor	Coal, Tars and coal tars	Sea floor

Adapted from Bonn Agreement Counter Pollution Manual - Chapter 26 Hazardous Materials
* - *Includes water miscible (*dissolving) substances.

4.3.1 Identification of potential pollutants from exploration activities

Due to the early and exploratory nature of offshore exploration drilling activities, the Titleholder may not hold samples of the potential pollutants or be able to fully characterise these. In such circumstances Titleholders will need to make judgements about the character of any potential pollutants and their behaviour based on the anticipated products, so that this can be included in their MPCP.

To enable an assessment of the validity of the geological assumptions used in the assessing the pollutant behaviour and character, it is recommended that the Titleholder provide the following information in their MPCP:

- *A technical description of the prospect that the proposed well will test.*
- *A technical description of the petroleum reservoir that the proposed well will test.*
- *A geological prognosis for the proposed well. This should include the depth of the formation tops, potential hydrocarbon bearing reservoirs, source rocks and seals that will be intersected by the proposed well.*
- *A description of the hydrocarbon charge model(s) that have been invoked for each of the potentially hydrocarbon bearing reservoirs that the proposed well will intersect. This should include a description of the geochemical attributes of the petroleum source rocks used in the charge model(s) and the source of these attributes.*
- *The basis of the assumptions that have been made in respect of API gravity of the oil and/or condensate to gas ratio (CGR) of the gas used in the oil spill modelling.*

4.4 Calculation of potential spill volumes

For each of the identified spill scenarios and pollutant types, operators should estimate the volume of pollutant that could be released and the volume that will need to be responded to.

The calculation of pollutant volumes should consider:

- **The rate of release** *- This includes consideration of whether the release is instantaneous or occurs over a period of time.*
- **The spill duration** *- the time period over which the release of pollution is likely to occur (hours, weeks, months).*
- **Oil weathering and behaviour***– In particular, slick volume losses through evaporation and volume increases through emulsification should be considered.*

The estimated release rate and spill duration are critical for environmental risk assessment, response planning and the determination of spill response capability. For example, an instantaneous release of 1000m³ requires significantly greater resourcing than the same volume released over 10 days.

The operator should document the reasoning behind the estimation of spill volume. For example, assessing an uncontrolled blowout from an offshore production facility might reference any blowout management planning to determine the time required to source a relief well and undertake interception operations.

Table 10 provides guidance on the determination of volumes for the maximum credible case scenario.

Table 10 - Indicative maximum credible spill volumes

Scenario			Basis of Volume Calculation
Source	**Incident**		
Oil Tanker[1]	Collision	Major[2]	Volume of largest 2 outside tank + one adjacent inner tank.
		Non-major[3]	100% of volume of largest wing tank (i.e. not double hulled) or 50% of tank protected by double hull.
	Grounding	Major[4]	Volume of largest two consecutive potentially impacted tanks
		Non-major[5]	100% of volume of largest wing tank (i.e. not double hulled) or 50% of tank protected by double hull.
Other Vessel[7]	Collision		Volume of largest fuel tank
	Grounding	Major[6]	Total fuel volume + cargo
		Non-major[8]	Total fuel of 1 tank
MODU/ Production Platform	Blowout		Predicted flow rates per day x days estimated to get a relief rig on site + 20 days to cap well9
	Refuelling (Continuous supervision)		Transfer rate x 15 minutes of flow[9]
	Refuelling (Intermittent supervision)		Transfer rate x 2 hours[10]
Onshore Pipeline	Rupture		100% of maximum flow for 1 hour + volume of affected pipeline section[11]
	Leak (above LoD)[12]		2% of maximum daily flow x 4 days or time taken to reach and repair leak[13]
	Leak (below LoD)		2% of maximum daily flow x 90 days or time taken to detect, reach and repair leak[13]
Offshore Pipeline	Rupture		Maximum daily flow rate x 1 hour + volume of oil in the pipeline[14]
	Leak		2% of maximum daily flow x 1 day + time taken to clear/flush the pipeline with seawater[15]

Note: To be used for planning purposes if actual volumes cannot be, or have not been, calculated.

1. See Table 11.
2. Assumes penetration of external and internal hull at the water line and based on the loss of contents of largest potentially impacted cargo tank.
3. Based on the loss of contents of largest outside tank (including fuel tanks). In the case of tanks protected by double hull a maximum potential loss of 50% of the contents is assumed.
4. Based on the total loss of the vessel.
5. Based on vessel with bottom tanks. If no bottom tanks are present then there is no anticipated volume loss.
6. If a supply vessel carrying fuel as cargo, treat as a tanker.
7. Based on rupture to all impacted tanks and/or loss of vessel.
8. Based on damage to one impacted tank. Note: If tanks cannot be holed, this scenario will result in no loss.
9. Estimated days to get a relief rig onsite should be supported by a Blow-out Management Plan or other documentation. Alternative strategies for well control may be used but should be supported.
10. If spills can only be to deck then volume held by scuppers etc. may be deleted from the total provided that this volume will be recovered.
11. Based on presence of leak detection system, block valves and automatic shutdown systems. Note one hour shutdown time may be reduced if effectiveness of systems can be supported.
12. LOD = Level of Detection, as stipulated by pipeline automatic detection systems.
13. Times taken to reach and repair leak sites may be reduced if shorter times can be demonstrated.
14. Based on ability to detect major faults but absence of block valves.
15. Assumes daily over flights that will detect sheens.

Table 11 provides guidance on the estimation of spill volume (tonnes) for incidents involving tankers.

Table 11 - Effect of oil tanker size on maximum credible spill volumes (tonnes)

Vessel Tonnage (DWT)	Major Incident Grounding with Rupture (Two Wing Tanks + One Centre Tank) (tonnes)	Non Major Incident Slight Grounding or Collision (One Wing Tank) (tonnes)	Fuel Oil (tonnes)
30000	3000	700	450
50000	5000	1000	750
70000	12000	3000	1800
100000	21000	5500	2300
200000	45000	10500	2750
240000	60000	15000	4000

Adapted from IPIECA, 2000.

Oil weathering should be considered in cases where this is likely to be significant in the time frame between spillage and impact of oil on sensitive resources (or response).

5. Environmental risk assessment

This section outlines the process for assessing the marine pollution risks for the facility and/or operation. The risk assessment is used to determine the response objectives that underpin the required response capability.

For the purposes of contingency planning, the risk assessment comprises:

- *An assessment of the area (surface and subsurface) likely to be affected by oil and chemicals released from the facility and/or operation. This is referred to as the Zone of Potential Impact.*
- *An assessment of the likely impacts to environmental and socio-economic resources.*

5.1 Determining the Zone of Potential Impact (ZPI)

In developing their MPCP, operators should determine the area (including subsurface) over which a release of oil and/or chemicals will potentially have an environmental effect. This area is referred to as the zone of potential impact (ZPI). The response strategies of the MPCP should focus on the protection and remediation of resources within the ZPI.

For the purpose of this Guideline, the outer perimeter of the ZPI is defined as the level of exposure below which no discernible effects are expected. However, operators should be aware that there may be other definitions within relevant regulations or legislation, such as the Environment Protection and Biodiversity Conservation Act 1999. It should be noted that ZPI defines only the area (and possibly depth also) of potential exposure and does not indicate the actualimpact, exposure or effect from a particular event.

The ZPI perimeters can be based on two considerations:

- **Concentration** *within the water column, expressed as a concentration, e.g. parts per million (ppm), and may reflect toxicity exposure or physical contact.*
- **Film thickness** *on the water surface, expressed in millimetres (mm) or microns (um), and may reflect the likelihood of contact.*

5.1.1 Modelling the zone of potential impact

Stochastic modelling is the recommended method for determining the ZPI. This modelling should be conducted in three dimensions to ensure the distribution of sub-surface hydrocarbons and chemicals is measured. The modelling should be representative of the range of environmental conditions (tidal, current and winds) that are present at a location.

Operators should model the following scenarios if it has been identified that more than one product could be released:

- *The worst case spill volume and maximum credible case spill volume for surface releases.*
- *Worst and maximum credible case spill volumes for sub-surface releases.*
- *Worst and credible case spill volumes for water miscible hydrocarbons and chemicals.*

The modelling output should also be evaluated to determine the following:

- *Conditions are which impact is most likely.*
- *Behaviour of the oil and/or chemicals, in particular weathering processes.*
- *Environmental and other factors that may influence the potential for impacts to natural and socio-economic resources.*

5.1.2 Modelling parameters

Stochastic models can simulate a spill of oil or chemicals until the products being modelled are extremely dispersed or diluted. Such outputs can significantly overstate the area over which impacts are likely to occur and accordingly misdirect the development of response strategies.

This Guideline recommends including toxicity and contact parameters to provide for effective definition of the ZPI perimeter.

5.1.2.1 Toxicity parameters for oil and chemicals

Sub-surface stochastic modelling should be undertaken for water miscible or dispersed hydrocarbons and chemicals. The operator should determine a toxicity parameter to define the ZPI for these products.

Toxicity parameters can be determined through the use of one or more of the following toxicity measures:

- *50% Lethal Exposure (LE_{50}).*
- *50% Lethal Concentration (LC_{50}).*
- *50% Lethal Dose (LD_{50}).*

The selection of the toxicity measure should reflect the main species of concern within the receiving environment.

It should be noted that each of these measures are generally measured over a fixed period of time (between 48 and 96 hours) and these can exceed field (sea or coastal) exposure times (often more than 24 hours).

To reflect likely real field exposure times in their risk assessments and modelling, it is recommended that operators seek expert advice to adjust these measures to such shorter exposure periods, as appropriate, through reference to the relevant species exposure profiles as determined through laboratory testing and/ or reference to ecotoxicology literature. Rarely is a toxicant dose-response relationship linear, and so calculating a one hour equivalent exposure LE_{50} value of 960 ppb as the inverse of a 96 hour LE_{50} value of 10ppb, could be very inappropriate." Refer to French-McCay 2002 and French-McCay 2011 for more detail about the use of modelling in determining oil toxicity and exposure models.

5.1.2.2 Surface Slick Parameters for Modelling Oil and Chemical Zones of Potential Impact

Surface stochastic models should be undertaken for floating oil and chemical products.

This guideline recommends a surface oil parameter of 0.01mm thickness or 10 microns. This measure has been selected as the likely thickness to cause a smothering effect to species that might interact with the surface oil.

5.2 Assessing the likely environmental and socio-economic impacts

Once the ZPI has been determined, the operator should assess the likely environmental impacts within that zone. Specifically the assessment should:

- *Identify all the environmental and socio-economic resources that could be impacted by a spill or oil and/or chemicals.*
- *Assess the likely impacts that will occur according to each type of pollutant.*
- *Prioritise resources in accordance with their relative importance.*

Note – If gases can be released with fluids or generated through evaporation it is recommended that operators also undertake modelling to determine the spread of the gases for health and safety considerations.

Table 12 - Environmental and socio-economic resources

Resource	Type/location	Examples
Natural	Coastal habitats	Shoreline habitats Turtle nesting areas Seal haul our areas Bird roosting, nesting or feeding areas Inter-tidal habitats (mangrove, mudflat, saltmarsh)
	Inshore habitats	Coral reefs Shallow water seagrass Fish spawning areas
	Open water habitats and species	Reefs, shoals and sandbanks Marine birds Whales, dolphins and turtles Fish spawning Plankton aggregations
Economic / Financial	Fisheries	Demersal (mid to bottom-water) Pelagic (surface-mid water) Crustaceans and molluscs (lobsters, oysters, etc)
	Tourism	Tourist beaches
	Commercial operations	Ports Saltpans Mariculture/aquaculture Offshore Installations – power, desalinisation, etc. Power plants and water intakes
Heritage	Archaeology	Historic shipwrecks Aesthetic heritage values
	Cultural	Indigenous, historic or community sites of value
Social / Community	Recreational	Amenity beaches Recreational fisheries

5.2.1 Identification of the resources at risk

Operators should identify, map and document the environmental and socio-economic resources within the Zone of Potential Environmental Impact (ZPI). Resources that may be considered are listed at Table 12. This list is not exhaustive. Operators should be aware that some of the resources at risk will fall under legislative or regulatory requirements or definitions, such as those that are "matters of national environmental significance" under the EPBC Act 1991.

The operator should identify seasonal and other variations that may apply to those resources (e.g. nesting seasons, fishing seasons, short term events).

There are a number of resource documents that an operator may wish to consider in undertaking thisexercise, including:

- *Environmental management plans for the facility and/or operation.*
- *Baseline or environmental monitoring data collected as part of the operation of a facility.*
- *Marine Bioregional Plans: https://www.dcceew.gov.au/environment/marine/marine-bioregional-plans.*
- *Consideration should also be given to whether a species or habitat has protected status.*

5.2.2 Assessment of the potential environmental effect

Operators should assess the likely effect of the spill scenarios for each resource type identified within the ZPI. This assessment should consider:

- *The sensitivity of the resource types to the spilled oil and/or chemical*
- *The environmental and other factors that may influence:*
  - *Potential (probability) for impact.*
  - *Degree of impact or exposure.*
  - *Effect of the impact.*
  - *Potential for recovery of the impacted resources.*

In assessing the likely effects, operators should consider the relevant literature, or in the case of marine pollutants in the water column, refer to relevant laboratory eco-toxicity data. For resources with other legislative requirements, such as those designated matters of national environmental significance under the EPBC Act 1991, significant impact assessment guidelines exist to assist operators assess the level of impact.

5.2.3 Establishing response objectives

The environmental assessment provides the basis for establishing spill response objectives. The response strategies selected by the operator will be informed by the response objectives.

Specifically the response objectives should consider:

- *The relative priority of the each resource within the ZPI*
- *The protection of key (sensitive and important) resources*
- *The cleaning or remediation of impacted resources*
- *Monitoring or impacted, or potentially impacted, resources.*

Operators should consult with relevant Government and other stakeholders when determining response objectives, as they may have expectations about response priorities.

6. Determining the response strategy

This section outlines the processes for:

- *Evaluating the various response options available to meet the agreed response objectives.*
- *Determining the necessary response capability, including equipment, personnel and other resources, to effectively implement the response strategy.*

Specifically this section outlines a process to:

- *Determine the area over which response operations can be effectively implemented (referred to as the "area of operations").*
- *The consideration of response objectives and protection priorities in the assessment of response strategies.*
- *The selection of appropriate response strategies.*
- *The conduct of an Environmental Risk Assessment (ERA) to assess the likely effectiveness of the response strategies.*
- *Determining the actual resources that are required to implement each response strategy.*

The response capability is not only dependent upon the amount of equipment stockpiled, but also the ability to deploy the equipment effectively. The capability is also determined by the ability of response personnel to execute the plan and response operation.

6.1 Operators responsibilities

The National Plan states that:

> *"... operators of ports, maritime facilities, oil and chemical terminals are normally a designated Control Agency and have a responsibility for maintaining appropriate equipment stocks commensurate with the risks posed by their operations and access to sufficient trained personnel to effectively deploy that equipment. These control agencies should at a minimum maintain stocks of equipment or cooperative arrangements for the supply of such equipment, sufficient to maintain response operations until such time as other resources can be deployed in support. This is generally referred to as the first-strike capability and will vary from location to location".*

Each jurisdiction is responsible for determining the capability required by a local control agency.

6.1.1 Immediate response capability

This Guideline notes that the required immediate response (or first strike) capability will vary according to the proximity of the operation to supplementary resources. Table 13 provides definitions to guide the provision of response resources. The immediate response is that which the operator has planned to launch on-site, while other resources are being readied. In contrast, Level 1 is the capability that the operator is required hold, both on-site (including immediate response capability) and off-site (including incident management) to respond to a planned incident.

Table 13 - Levels of provision of response resources

Resources		Definition
Level 1 **(Operator Resources)**	**On-site (Immediate Response)**	The response resources that are maintained within the immediate area of a facility (or vessel) or activity. The on-site capability should be mobilised within one hour of the incident being reported and should be sufficient to maintain the response effort until support resources arrive on-scene.
	Supporting	Resources that are maintained locally to supplement the on-site (immediate response) resources.
Level 2		Resources that are located and maintained regionally within the adjacent State or Territory.
Level 3		Resources that are maintained nationally or internationally that can be applied to the incident.

The Level 1 response resources maintained by the operator should be sufficient to:

- *Monitor the location of the oil or chemicals at sea*
- *Model and predict the trajectory, distribution and behaviour of oil or chemicals at sea*
- *Protect identified sensitive resources from impact from the oil or chemical*
- *Contain and recover oil or chemicals at sea (where practicable)*
- *Apply dispersants to surface oil (where applicable)*
- *Monitor and assess response activities*
- *Clean and remediate impacted resources*
- *Store, transport and dispose of recovered waste*
- *Protect the health and safety of responders and the public.*

6.2 Determining Level 1 Resources

The Level 1 resources maintained by the operation must reflect the risk associated with the facility and/or operation.

Response times are a critical factor in determining Level 1 resources. Resourcing should be such that:

- *On-site resources are sufficient to undertake all anticipated response activities until support resources can be applied on-scene.*
- *Support resources should be sufficient to undertake all anticipated response activities until additional resources, or Level 2 resources, can be applied on-scene.*

6.3 Determining the Area of Operations

The ZPI identifies the total area over which an environmental impact could be expected from all of the identified spill scenarios. Effective response operations will normally not be required to be conducted over the entire ZPI, as not all scenarios will occur at once, natural phenomena, such as wind will tend to blow in one direction at a time, and natural weathering and spread of the oil and/or chemical, e.g. the thickness of an oil slick will reduce to a point where containment and recovery, and dispersant operations are ineffective.

So, for any given scenario, including pollutant type, volume, weather, sea state, tides, etc. operators should determine the area over which operations are likely to be effective. This is referred to as the Area of Operations, and can be determined through stochastic modelling, as per the ZPI. The modelling should consider credible and worst case scenarios.

The operator should apply the following parameters to the modelling of oil:

- *0.5 micron thickness – Below this thickness oil is unlikely to be visible, even from aircraft, unless fitted with specialist remote sensing equipment. This delineates the area over which aerial surveillance may be required and assists with aircraft selection.*
- *10 microns thickness – Below this thickness containment and recovery and chemical treatment (dispersants) become ineffective. Note, at this thickness, 300 metres of deployed boom would gather and contain only 1.8m³ of oil per hour under optimal conditions.*

The setting of parameters for chemicals is more complicated than for oil, however the operator should consider the persistence of the material upon the sea surface and the available conditions required to implement appropriate response options. Operators may also wish to consider the use of modelling to define areas over which water sampling and monitoring should be conducted for chemicals, especially where there is the potential for human health (e.g. fisheries contamination) and environmental impacts.

6.4 Consideration of protection priorities

Protection priorities should be developed as part of the environmental risk assessment process (see section 5.2). The protection priorities need to be evaluated against each of the available response options to determine operational effectiveness. It is possible that a number of the identified protection priorities will not be able to be achieved under some conditions (sea state, weather, daylight hours, etc.).

In such circumstances operators should re-evaluate the protection priorities and response objectives to ensure resources are directed to achieve the greatest degree of benefit, including environmental benefit.

Operators should document the reasons where a response strategy cannot be implemented to protect a high priority resource.

6.5 Response strategy assessment

Each response strategy should be evaluated to determine whether it will cause a greater degree of harm relative to leaving the pollutant to degrade naturally. This assessment is referred to as strategic Environmental Risk Assessment (ERA) and sometimes strategic Net Environmental Benefit Analysis (NEBA). It should have a broader perspective than these names suggest. Many sensitive resources are environmental (see Table 12 in section 5.2 above), and these come in many forms. Many other valued resources are social, community, or economic in nature. And while protection of sensitive environmental resources may be a high priority, other resources cannot be ignored.

Ideally, such an assessment should be undertaken on all response options for all scenarios under all conditions, during the development of a Marine Pollution Contingency Plan (MPCP). However, it is acknowledged that it is unlikely that all combinations of circumstances and conditions can be anticipated or included, and so further detailed assessments will also be undertaken during any response. Without the actual response Incident Action Plan, developed based on the MPCP, and the exact circumstances of the spill, attempting a detailed operational NEBA in advance is of little value.

What is required is an assessment of the relative merits of each response option, against a number of criteria. One important assessment would be whether to leave the pollutant to disperse, dilute or weather naturally. Another would be to determine which sensitive or priority resources could actually be protected given the time and response resources available.

6.5.1 Strategic assessment approach

A strategic ERA or NEBA can be a useful process for assessing the comparative environmental benefits of general spill response options for a particular spill scenario.

In its simplest form this is a structured approach to determine whether a particular strategy or method will be of environmental benefit compared with leaving the oil to weather naturally and for the slick to break up.

A more complex procedure involves assessing numerous strategies to determine which results in the best in its simplest form this is a structured approach to determine whether a particular strategy or method will be of environmental benefit compared with leaving the oil to weather naturally and for the slick to break up.

A more complex procedure involves assessing numerous strategies to determine which results in the best environmental gains, or at least identifies the strategy which is the least damaging.

Essentially, it is a comparative risk assessment done on the basis of the contingent scenarios under consideration, which must consider:

- *The likely type, size and significance of ecological or environmental harm that may result from each response option, including:*
  - *Short-term v long-term effects (lifecycle, acute, chronic, latent).*
  - *The capacity of the impacted resource (populations, habitats, communities) to recover and the time that this will take.*
  - *Possible secondary ecological effects, such as non-impacted species being harmed due to impacts on ecologically related species. Examples of this are a loss of prey leading to declining predator numbers, or seagrasses being damaged by algal blooms resulting from fewer grazing invertebrates.*
- *Potential economic or direct financial losses. These may relate to biological losses but may be related to the distribution of the oil and response decisions. An example of this is if dispersants are used to prevent oil hitting a recreational shoreline. This may reduce economic losses to say tourism but must be considered against potential increasing damage to fisheries. Difficulties arise when the potential for damage cannot be defined or may appear over a period of years. Generally these issues relate to ecological damages (e.g. fisheries).*
- *Social/heritage/political considerations. Recent incidents have clearly demonstrated the value the community places on recreational resources such as beaches.*

Often, information is incomplete and some parts of the assessment will be based on probabilities. It is important that, where possible, a consensus is reached on these decisions amongst stakeholders, and that these decisions are documented and recorded in the MPCP.

6.5.2 Operational Considerations

A number of operational factors must also be considered. This is why this type of analysis, completed as part of the MPCP development, cannot substitute for the initial operational NEBA undertaken during the actual response to inform the Incident Action Plan.

Foremost among the operational factors to be considered is the effectiveness of each strategy or method.If a strategy is only partially successful this must be factored into any assessment of harm and benefit.
For example, aerial dispersant operations or containment and recovery operations using booms are two strategies that require very specific weather conditions to be effective. Both are affected by oil weathering and an overnight hiatus in operations can reduce effectiveness markedly.

The efficiency and effectiveness of strategies are greatly influenced by ambient conditions (sea state, wind etc.) and available resources and so this assessment will largely have to be undertaken at the time of a response.

6.5.3 Other Considerations

Risk or benefit assessment will be one aspect of the decisions made regarding acceptable contingency planning. Other considerations will include:

- *Health and safety issues.*
- *Mobilisation times*
- *Logistics*
- *Cost*

These will also apply during the response when NEBA recommendations are being considered as part ofthe IAP.

6.6 Determining response times

The operator should determine the 'window of opportunity' available to implement a response strategy. This is the time that elapses from the point of release to identified resources. This assessment is undertaken to determine the practicality of implementing a given response option.

The window of opportunity can be determined from the stochastic modelling. The modelling should consider average weather conditions, though the operator may also wish to model 'worst case' (shortest time) conditions.

6.7 Response strategies

This Guideline does not seek to identify a 'one size fits all' approach to the selection of the response strategies or methods to be employed by an operator to control a pollution incident. The response to a spill of oil or chemicals will be specific to the nature and location of the incident, the identified objectives and the environmental and socio-economic sensitivities.

This Guideline recommends operators select response strategies that will achieve the agreed response objectives and are the most appropriate action to minimise impact on the environment and community.

Whilst the following guidance may appear to be a detailed description and summary of the available response strategies, a great deal more technical material is available from expert agencies. This is necessarily a short summary with key information, and is provided to assist in the general selection of appropriate strategies. Operators need to consider their specific circumstances and needs.

6.7.1 Natural recovery

Where a spill does not pose a threat to sensitive natural and socio-economic resources, the most appropriate response strategy may be to allow the oil or chemical to degrade naturally. Such a strategy should be supported by modelling and confirmed by monitoring or surveillance.

Surface slicks of oil are most effectively monitored through the use of aerial surveillance.

Chemicals or dispersed oil that mix into the water column may require water quality or other field monitoring.

The operator is required to have sufficient resources to monitor surface slicks until there are no visual signs of pollution on the sea surface. It is recommended that this capability be undertaken by aircraft, though operators may consider vessels, satellite or other methods.

6.7.1.1 Aerial surveillance

Operators should maintain the capacity to undertake immediate aerial surveillance operations in order to track the movement of surface slicks. Such surveillance can be conducted by fixed wing or rotary aircraft.

Ideally the aerial surveillance should be airborne within two (2) hours of notification of an incident. The MPCP should detail the circumstances and process under which the aerial surveillance will be activated (i.e. aerial surveillance might not be required for minor incidents).

The operator should ensure there are sufficient trained observers to perform this task. The MPCP should define the training requirements for these personnel.

6.7.1.2 Vessel surveillance

The operator may consider the use of vessel surveillance to monitor the initial pollution event until such time as aerial assets become available.

Vessel surveillance is considered appropriate for minor incidents or where modelling predicts the product will dissipate within six (6) hours.

The operator may wish to consider the deployment of tracking buoys from vessels to assist with the monitoring of the slick during night.

> **Note** – Vessel surveillance may not be suitable for volatile oils or gaseous chemicals due to safety concerns.

6.7.1.3 Satellite imagery

Satellite imagery in particular, satellite radar, may be used to monitor large areas of sea. The MPCP should detail procedures for the procurement of imagery and requirements to verify satellite data.

6.7.2 Marine response

6.7.2.1 Containment and recovery

Containment and recovery is generally the preferred method of marine response. This strategy requires a combined equipment and capabilities approach:

- *Containment: Booms, including side sweep systems.*
- *Recovery: Skimmers, vacuum systems or sorbents.*
- *Waste handling, including:*
  - *On scene storage.*
  - *Transport from the incident scene to shore based storage.*
  - *Onshore treatment or disposal.*
- *Vessels or other suitable work platforms for each of the above.*

Operators should prepare a strategy for the oil recovery operations if the oil is classified as persistent (refer to Table 7 in section 4.3).

6.7.2.2 Immediate (On-Site) Capability

Where identified as an appropriate strategy, operators should maintain an on-scene capability for the recovery of oil or chemicals that addresses the following criteria:

- *The response can be maintained until supporting resourcing can be applied on-scene.*
- *Equipment is of a design and specification suitable for the environmental conditions, e.g. protected waters, open water.*
- *The immediate response can be deployed within one hour of the incident being reported.*
- *Boom can be deployed in a suitable array:*
  - *There are sufficient vessels to undertake the anticipated deployment, e.g. two vessels for an open water boom array, one vessel for a side sweep. (NB: The fast rescue craft is not a suitable vessel for boom deployment due to regulatory requirements for this vessel to be available at all times for rescue).*
  - *Vessels have the power to hold a boom array under the anticipated sea conditions.*
- *For inshore operations, suitable and adequate anchoring systems are available with sufficient andsuitable tender vessels.*
- *The rated recovery of the skimmers should be sufficient to recover the anticipated rate of oil volume encountered by the boom array.*
- *The available on-scene storage capacity should be sufficient to hold the anticipated volume of recovered oil until such time as additional storage can be provided on-scene.*

6.7.2.3 Containment (Boom) Capacity

The operator should assess the effectiveness of the proposed booming strategy in relation to the anticipated rate of release of oil or chemicals. This will enable the operator to determine whether additional boom is required or additional alternative strategies (e.g. dispersants) need to be implemented to meet the response objectives. For example the operator may determine that the proposed booming strategy will only recover 50% of the anticipated release. The operator may choose under such circumstances to double the booming capability, or implement a supplementary strategy such as dispersants.

A booms capacity is measured by the amount of oil (or floating chemicals) that can be encountered by the boom array per hour (referred to as the Boom Encounter Rate or BER). The BER can be calculated from:

- *The length of boom employed (referred to as LB) and the consequent "swathe" of the boom array, i.e. the opening of boom array. For planning purposes the swathe is 30% of the total boom length being deployed.*
- *The speed (velocity, V) at which the boom array can be effectively operated. For planning purposes this is assumed to be 1 knot (1852 metres/hour). Note: There are a new generation of advancing systems which can be effectively deployed in conditions above 1 knot.*
- *The average thickness (T) of the oil or chemical slick.*
- *The "percentage cover" of the oil or chemical on the sea surface. For planning purposes this is considered to be 100% during the initial stages of the response operation.*

The boom encounter rate is therefore calculated as follows:

$$BER = (LB \times 0.3) \times V \times T$$

This Guideline recommends that oil thickness be determined through modelling, however Table 14 provides indicative slick thickness and estimate boom encounter rate. Table 14 assumes a standard boom length of 300 metres.

Table 14 - Indicative boom encounter rate (planning targets)

	Time (Hr)	1	2	3	4	6	12	24
Group II Oil	Thickness (mm)	0.217	0.128	0.094	0.076	0.056	0.034	0.020
	BER (m3/hr)	36.2	21.3	15.7	12.7	9.3	5.7	3.3
Group II or III Oil	Thickness (mm)	0.474	0.283	0.207	0.167	0.123	0.074	0.044
	BER (m3/hr)	79.0	47.2	34.5	27.8	20.5	12.3	7.3

This indicates that the BER appears to reduce by an order of magnitude over 24 hours, and so is likely to be 10% as effective on Day Two of a response as Day One. Put another way, ten times more effort, equipment and personnel will be required for the same result.

The operator should select boom suitable for the likely environmental conditions around the facility, e.g. protected water, open waters etc. Operators may wish to refer to the relevant international standard in the selection of boom, including:

- *ASTM F2683-1 Standard Guide for Selection of Booms for Oil Spill Response.*
- *ASTM F1523-94 Guide for Selection of Boom in Accordance with Water Body Classification.*

6.7.2.4 Recovery (Skimmer) Capacity

The recovery capacity should be sufficient to recover the volume of contained oil and or chemicals. The recovery rate for a skimmer can be determined from the manufacturers rating for the skimmer (usually measured in m³/hour).

The operator should consider the following when considering the selection of skimmer:

- *The anticipated volume of release.*
- *The anticipated encounter rate (BER).*
- *The properties of oil or chemical (e.g. viscosity).*
- *The environmental conditions.*

The operator should refer to the relevant international standard when selecting skimmers:

- *ASTM F1778-97 Standard Guide for Selection of Skimmers for Oil Spill Response.*

6.7.2.5 On-site storage of recovered oil and chemicals

The requirement for storage of recovered oil and chemicals can limit the effectiveness of oil recovery operations. The operator should plan to have sufficient storage to hold the product recovered from the sea surface.

Where sufficient storage is not available the operator may need to consider the employment of alternative response strategies, e.g. dispersants.

6.7.2.6 Support capability

The operator should detail within the MPCP the process for the activation and application of supporting resources, including Level 2 and 3 resources. This should take account of:

- *Deployment times for these resources, both equipment and personnel.*
- *Availability of suitable vessels.*
- *Establishing effective logistics.*
- *Ensuring there is sufficient waste storage support.*

The support capability should be based on the maximum credible spill scenario, however the operator should prepare to escalate the response should this planning scenario be exceeded.

6.7.3 Oil spill dispersants

Oil spill dispersants are an important tool for the management of large oil spills. In determining whether dispersants are an appropriate response strategy, the operator should:

- *Ensure that the oil is amenable to chemical dispersion. This can be determined through testing.*
- *Determine the window of opportunity for dispersant application. This can be done through pre incident testing or predicted through computer modelling.*
- *Assess whether a net benefit can be achieved through the use of dispersants (see Section 6.5).*

The operator should also consider any regulatory requirements for the use of dispersants during a marine pollution incident.

Note – Only dispersants listed on the National Plan Register of Oil Spill Control Agents should be employed for maritime oil spill response operations in Australia. The offshore oil and gas industry have their own requirements and processes.

6.7.3.1 Immediate (on-scene) capability

The operator should plan to have a vessel based dispersant operation implemented within one hour of formal approval from the Incident Controller. The dispersant capability should be sufficient to treat oil using on-site vessels until supporting resources can be applied on-scene.

The response times for additional vessel based dispersant capability, in conjunction with anticipated spill volumes and efficacy of other response options (e.g. containment and recovery), should be employed to determine the quantity of dispersant held locally.

6.7.3.2 Support capability

The operator should consider two methods of Level 2/3 support for dispersant operations:

1. *Continuation of ongoing vessel based dispersant operations.*
2. *Implementation of fixed-wing aerial dispersant operations.*

In both situations the operation should assess:

- *The number of vessels or aircraft required to apply the anticipated volume (and rate) of dispersantuse.*
- *The time required to deploy the vessels or aircraft on site.*
- *Logistics, including the resupply of dispersant.*

In the case of fixed wing dispersant operations, the operator should also consider:

- *Command aircraft to direct aerial dispersant operations.*
- *Effective search and rescue support.*
- *Trained observers to direct low level aerial operations.*

6.7.3.3 Calculation of dispersant quantities

The calculation of the total volume of dispersant required to treat a particular scenario should assume a dispersant/oil ration of 1:20 (i.e. 1000 litres of dispersant treats 20000 litres of oil). The calculation should also consider:

- *Oil spill volumes and the potential rate of release.*
- *The proportion of the total oil volume that is anticipated to require dispersant application.*
- *Planned rates of dispersant consumption.*
- *Dispersant stockpile replenishment times.*
- *Response times for support resources.*

The operator should also identify the amount of oil that can be reasonably treated within the 'window of opportunity' for the particular oil (i.e. the time period that oil is amenable to chemical dispersion). This should consider the total volume of oil that can be reasonably treated within the time period.

The operator should consider the relevant international standards and guidelines such as:

- *ASTM F1413-07 Standard Guide for Selection of Oil Spill Dispersant Equipment: boom and Nozzle Systems.*

6.7.3.4 Monitoring of dispersant operations

The operator should plan for the monitoring of the dispersant operation, including:

- *Dispersant effectiveness (aerial or ground observation and/or field testing of oil).*
- *Fate of the dispersed oil (modelling and/or water sampling and analysis).*
- *An assessment of any potential environmental effects resulting from the dispersed oil.*

A tiered approach to such monitoring can be considered, comprising:

- *Visual observations of effectiveness.*
- *Field efficacy testing.*
- *Modelling of dispersed oil plume.*
- *Use of fluorometry or other similar technologies.*
- *Water quality monitoring.*

The MPCP should indicate the process for activation the monitoring activity.

6.7.4 In-situ burning

In-situ burning is not a generally recognised response strategy within Australia, however it is not proscribed.

Operators that wish to consider burning as a response strategy should:

Note – For in-situ burning operations, only accelerants listed on the National Plan Register of Oil Spill Control Agents should be employed for maritime oil spill response operations in Australia.

- *Assess whether a net environmental benefit can be achieved through burning (see section 6.5).*
- *Obtain relevant approvals from government agencies.*
- *Develop a safety plan.*

6.7.5 Shoreline response

The operator, as part of the risk assessment, should have assessed the potential for shoreline impact. Where impacts are probable and is likely to cause harm to natural or socio-economic resources, a shoreline response strategy should be implemented to address:

- *The protection of high priority areas.*
- *The cleaning of impacted shorelines or other resources.*

6.7.5.1 Shoreline protection

The operator should consider strategies to protect shorelines. Such strategies could include:

- *Exclusion booming.*
- *Deflection booming.*
- *Earth or sand barriers.*
- *Shoreline treatment agents.*

In evaluating the potential success of shoreline protection methods the operator should consider the following issues:

- *Operating environment, e.g. shoreline character, wave energy, current strength etc.*
- *Type and availability of equipment required, e.g. booms, machinery, vessels.*
- *Time and resources available to implement the protection strategy.*

Note – Only shoreline treatment agents listed on the National Plan Register of Oil Spill Control Agents should be employed for maritime oil spill response operations in Australia.

6.7.5.2 Shoreline cleaning and remediation

The operator should consider strategies to clean and remediate impacted shorelines and other resources. These strategies include:

- *Manual cleaning.*
- *Mechanical cleaning.*
- *Washing methods.*
- *Use of shoreline treatment agents, e.g. bioremediation, shoreline cleaners.*

The operator should consider the following issues:

- *Shoreline character.*
- *Logistics.*
- *Available resources.*
- *Environmental risk assessment and net environmental benefit analysis.*

The operator should assess shorelines and resources that may be impacted and select shoreline response strategies suitable for that environment.

6.7.6 Wildlife response

Wildlife response is generally the responsibility of the relevant Commonwealth or State/NT government wildlife agency. Operators should consult directly with these agencies to ensure that there are effective arrangements in place to manage the identified risks to wildlife, including:

- *Capture of oiled wildlife*
- *Transport of oiled wildlife*
- *Cleaning and treatment*
- *Rehabilitation.*

6.7.7 Waste management

Most response operations will result in the production of waste materials, e.g. recovered oil, disposal of empty dispersant containers etc. The operator should detail how recovered product and other waste materials are to be managed and ultimately disposed.

Potential waste volumes should be calculated based on:

- *Pollutant character*
- *Response methods*
- *Shoreline types*

Sufficient resources must be allocated to:

- *Contain recovered waste from marine operations. This requires:*
  - *On site storage adequate to contain the volume of oil recovered by skimmers during the immediate response, i.e. until supporting resources (including storage) are mobilised on scene.*
  - *Transport of recovered marine waste.*
- *Contain recovered waste from shoreline response. Note: this may be improvised.*
- *Transport waste to regional holding areas, if required.*
- *Store waste onshore, if required.*
- *Dispose of wastes in an approved manner.*

6.8 Termination and recovery

6.8.1 Termination

A MPCP should anticipate the need for a decision to terminate a response. As cleaning operations progress there will come one or many times when cleaning techniques become ineffective or when some pre-agreed level of clean has been reached. This could happen in one affected location during the response, or across the entire area of clean-up at its conclusion. A decision to cease cleaning operations needs to be made. Terminating operations requires three clear, but linked elements to be specified in the MPCP:

- *a defined decision-maker with the authority to terminate operations (normally the Incident Controller)*
- *a clear and well-documented consultative process to follow to apply in coming to the decision*
- *criteria that could apply in making the termination decision.*

The decision to terminate the whole response, or even to cease operations in one particular area, can be much more contentious than the decision and process to begin. So the termination process and criteria should support the incident management team to define the end-point of the response and to determine when additional 'cleaning' activity will not improve the response outcomes.

The MPCP should include clear reference to who has the role and authority to make this decision. It should also include within it clear and explicit processes for establishing and agreeing response-specific termination criteria during the response (as early as possible), and how these will apply. Although it is not possible to determine the exact parameters for all applicable termination criteria in the MPCP, the process defined should be flexible enough to take the following into account:

- *MPCP-defined overall response outcomes and objectives (e.g. linked to known pre-spill or pre-agreed conditions, through community and/or expert consultation)*
- *Incident-specific response objectives (as determined within the response Incident Action Plan)*
- *Expert guidance on termination criteria for particular activities or resources (e.g. acceptable levels of cleanliness, as outlined in the Response, Assessment and Termination of Cleaning for Oil Contaminated Foreshores.*

Table 15 - Guidelines for Agreed Environmental Values and Acceptable Levels of Clean

Note: Order in the table does not denote order of priority

Resource / Environmental Value	Acceptable Level of Clean	
Contact Surfaces[1]	No visible tar balls, slicks or sheens that could adhere to organisms or interfere with normal animal/plant feeding, life cycle processes and behaviour.	Compliance with ANZECC & ARMCANZ (2000) water quality guidelines to the required level of environmental protection.
Shoreline/intertidal sediments as habitat[2]	Need not be totally clean, but remaining residues must not inhibit potential for recovery through toxic or smothering effects.	
Subtidal substrata as habitat[3]	Remaining residues must not inhibit potential for recovery through toxic or smothering effects.	
Subsurface water as habitat	Oil contamination should not interfere with normal animal/plant feeding, movement, life history processes and behaviour. Must not be toxic to any life stages of key species or exceed recommended concentrations ANZECC & ARMCANZ (2000) water quality guidelines to the required level of environmental protection.	
Shoreline (as an ecosystem interacting with other aquatic near-shore ecosystems)	Remaining residues must not be mobile such that they will leach out into near-shore waters.	
Cultural and historic[4]	Sensitive to and, where possible, addressing needs of cultural custodians.	
Organisms and water that may be used for human consumption	Must meet relevant statutory specification for residues and taints (e.g. NHMRC, NFA, ANZECC).	
Must meet relevant statutory specification for residues and taints (e.g. NHMRC, NFA, ANZECC)	No visible oil or any oil that rubs off on people, boats or infrastructure, or causes a slip hazard. Compliance with Water Quality Australia's Recreational water guidelines, if required. Compliance with OHS requirements.	

Note:

1. *'Surfaces' includes water surfaces, sediment surfaces and hard surfaces, and is intended to encompass hard/ sediment surfaces that organisms move across, water surfaces that animals might broach to breath, feed or flee, and air/water interface for air-breathing organisms. In this last case, the definition of clean would include no air contamination.*
2. *Habitat is the place where organisms live and should be suitable for all organisms that naturally occur in the area.*
3. *Water is considered as a habitat for plankton, fish, corals, mammals, seagrasses, aquaculture species etc. Habitat includes suitable conditions to live in, as well as an appropriate environment to feed and to otherwise sustain viable populations (i.e. support life cycle processes).*
4. *Cultural values may be diverse and particular to each location and resource. Responders should consult relevant managers andstakeholders and be aware that, in some circumstances, oiling may be preferable to disturbance of sites.*

6.8.1.1 Stakeholder engagement in termination

As community and stakeholder understanding and expectations may play a role in both the decision to terminate a response and the acceptability of the decision, consultation with these groups is crucial. During MPCP development these groups can provide valuable advice about their expectations, generic criteria and processes to be added to the MPCP. Once a spill has occurred, and a response is underway, consultation can become more difficult so it is important to have a robust consultation process defined in your MPCP.

This will assist in being able to communicate the agreed MPCP priorities and outcomes and the response-specific objectives. The MPCP should list stakeholders who were engaged during the development of the priorities and objectives of the response plan, so they can be contacted. But always expect that other, new stakeholders and groups will become active during a spill response, and consultation processes should anticipate this.

6.8.2 Demobilisation

Termination of response activities necessitates demobilisation of personnel, response equipment, and logistical support. Demobilisation planning must begin before termination. It arranges for personnel and equipment no longer by the response to be redeployed or returned to normal duty. It can reduce the response management and operations levels to match response needs, reduce expenses and improve site safety. However, demobilisation is often ignored or given little consideration in oil and chemical spill contingency plans.

A MPCP is not complete without specific demobilisation procedures to ensure recognition of and planning for an organized, orderly and agreed-to process to help responders, their equipment and response facilities be returned to normal operating conditions. The incident management organisation should include a group whose job it is to plan, organize and implement demobilisation.

Within the MPCP the demobilisation section should address:

- *roles and responsibilities*
- *authority to plan and activate*
- *priorities for release of response resources*
- *decontamination and cleaning of equipment and personnel*
- *procedures for repairing and rehabilitating temporary response sites, facilities and infrastructure topre-response state and status*
- *procedures to return equipment and make ready for use on another incident*
- *procedures for returning personnel to their normal duties.*

6.8.3 Post-response recovery

Post-response recovery arrangements should also be outlined in the MPCP to the extent required under the plan's relevant regulatory or operational regime. These may include procedures to identify ongoing impacts to the environment or communities and provide a coordinated plan for addressing these. Depending on expectations, these may include:

- *restoring access to restricted areas*
- *repair of infrastructure and areas/sites impacted by the response operations*
- *post-spill impact and environmental monitoring (see section 6.9 below)*
- *assistance to individuals and businesses impacted by the incident or response activities*
- *rehabilitation of wildlife and spill-impacted areas*

The MPCP should plan for these processes to include significant stakeholder engagement as they will likely be dealing with significant and ongoing impacts to the community and environment.

6.8.4 Post-incident review and analysis

As developing a MPCP is about forecasting and planning for a successful response, post-incident review and analysis of any response under the MPCP can provide a valuable opportunity to assess the response arrangements and capture 'lessons learnt'. The MPCP should include reference to the process to be used for de-briefing and post-incident analysis with responders and stakeholders. The process for amending and updating the MPCP should also be identified as appropriate.

6.9 Post spill monitoring

6.9.1 Differing requirements for post-incident monitoring

Requirements for post-incident monitoring differ greatly between the new regulatory regime for the Australian offshore oil and gas exploration and production sector under NOPSEMA and the maritime sectors under the National Plan. Hence, when developing a MPCP, operators should be careful to ensure they are fully aware of any regulatory or legislative requirements for post-incident monitoring. Best practicein this area is still developing in Australia.

AMSA produced Oil Spill Monitoring Guidelines under the National Plan in 2003.

NOPSEMA also provides technical guidance regarding post-incident monitoring by the offshore oil and gas exploration and production sector at:

NOPSEMA's 2012 guidance expects that post-spill monitoring should provide a thorough assessment of the impacts of both the spill and the response, to sensitivities within the ZPI over the long-term. In the short-term the post-spill environmental monitoring should also function to provide a measurable demonstration of specific endpoint criteria for the purposes of evaluating the effectiveness of response strategies and initiating termination of the response. The design of monitoring programmes should ensure that data gathered during pre-spill monitoring is directly relevant and comparable to the data gathered during post-spill monitoring, or an alternate design proposed that enables impacts attributable to the oil.

6.10 Documentation of capability

All Level 1 equipment should be listed in the MPCP together with:

- *The capacity of each item.*
- *Location and/or mobilisation time.*
- *Operational constraints.*

As noted in section 7.4.1 an Indicative Response Outline (IRO) will be required for approval of a plan submitted for the first time.

This sets out a hypothetical sequence of actions taken in response to the identified Maximum Credible Spill scenario and will include estimates of response times and recovery or treatment of oil or HNS.

7. Preparation of the marine pollution contingency plan

This section provides guidance on the documentation of the response strategy and management arrangements within a Marine Pollution Contingency Plan.

This Guideline does not stipulate a specific structure; rather operators should employ a format that is:

- *Written clearly and allows users to quickly find and assess the required information.*
- *Compatible with the operators corporate planning processes.*
- *Consistent with any specific regulatory requirements.*
- *Consistent with the National Plan arrangements.*

7.1 Scope of the marine pollution contingency plan

A response plan may cover one facility or operation, or numerous facilities and operations. Plans that cover multiple facilities or activities should contain information that enables response operations specific to those facilities or activities to be implemented.

A MPCP should take into account:

- *Operator specific procedures and requirements.*
- *Site specific conditions.*
- *Specific environmental and socio-economic resources that may be impacted.*

7.2 Plan contents

An MPCP should outline the response structure, response strategy and relevant information required for decision making in the event of a marine pollution incident. The plan should demonstrate that the operator has the resources, management structure and skills required to implement an effective response operation.

> **Note** – *The MPCP should only contain information that is required to respond to a marine pollution incident. Supporting information or information used to develop the response strategy, e.g. stochastic modelling, oil assays etc. can be made available in supporting documents which can be called upon during the assessment or review of a contingency plan.*

The following sections provide additional guidance on specific plan content.

7.2.1 MPCP authority and responsibility

Each MPCP must clearly state:

- *The person responsible for authorising the plan within the Company. Ideally this should be the CEO or other senior person.*
- *The person responsible for the maintenance of the plan.*

7.2.2 Document control

This should be in accordance with the operator's internal document control system but must include:

- *The date of the last revision or other indication of the currency of the plan.*
- *Document number.*
- *Date or revision number on each page, if the document is loose-bound.*

7.2.3 Plan scope

This should summarise:

- *Facility (or facilities) or activity (or activities) covered by the plan. This should be accompanied by a simple map or facility layout. Note: Detailed descriptions of facilities are not required.*
- *Area covered by the plan.*
- *Substances covered by the plan. Note: Some operators may elect to cover Group I oils (e.g. refined products, condensates) and hazardous substances under an Emergency Response Plan due to the health and safety issues presented and the minimal response options possible. These ERPs may be reviewed and assessed by relevant authorities.*
- *Behaviour of potential pollutants in the sea.*
- *Health and safety issues associated with the potential pollutants.*
- *Potential environmental effects of an unmanaged spill and from response activities.*

Integration with other plans should also be stated.

7.2.4 Operator spill response management structure

This should include an organisation chart showing all teams, locations and responsibilities and should be consistent with National Plan and relevant State/NT Incident Control System (ICS) organisation.

7.2.5 Incident reporting

The operator should provide initial notification of an incident as soon as required or practical after confirmation of pollution. The National Plan has adopted consistency with the Australasian Inter-service Incident Management System (AIIMS). Notifications must be as per legal requirements, but may include:

- *Internal (Operator Company) reporting.*
- *Government reporting;*
  - *AMSA.*
  - *Relevant jurisdictional authority or control agency (see Table 1).*
  - *Nominated higher level control agency.*
  - *NOPSEMA.*
  - *Port authority*
- *Contracted response support agencies.*

Ideally, reporting will be via the standard National Plan or State/NT Plan Pollution Report (POLREP) form.

The initial report may be made verbally.

The operator should provide a formal POLREP to the above agencies within two (2) hours of pollution being confirmed.

7.2.6 Response initiation procedures

Responsibility for initiating a pollution incident response lies with the operator.

Operator authorities for initiating an immediate (on site) response and any ongoing Level 1 response must be clearly identified and stated within the plan.

7.2.7 Incident assessment

The operator should ideally have the capacity to commission spill trajectory modelling within one (1) hour of an incident occurring. Note: for inshore locations this requirement may be shortened as a condition of plan approval unless adequate pre-incident modelling has been undertaken.

7.2.8 Surveillance and monitoring

7.2.8.1 Aerial surveillance

All operators should have the capability to mobilise aerial surveillance in accordance with the response requirements detailed in section 6.7.1.1.

Methods used may include helicopters or dedicated aerial surveillance aircraft.

Trained observers are required, i.e. individuals competent in techniques for detecting oil, both visually and through interpretation of a range of remote sensing technologies.

The following information should be included within the contingency plan:

- *Contact details for contracted aerial surveillance provider*
- *Procedures for aerial response initiation*
- *Estimated resource mobilisation time, and*
- *If this service is provided by a contractor, evidence of contracts with companies providing aerial surveillance resources must be supplied. This can be in supporting documents (see section 7.3.1).*

7.2.8.2 Surveillance from Vessels

Guidelines for observing, reporting and assessing oil and HNS at sea should be included.These

should be in line with the Bonn Agreement Guidelines.

7.2.8.3 Other operational monitoring

The MPCP should designate responsibilities for operational (response) monitoring and provide guidelines for ongoing monitoring of the spill and the response.

7.2.9 Response Methods

7.2.9.1 Immediate Response Actions

The contingency plan must set out the actions to be taken immediately should a spill occur.

These actions should reflect the nature of the release (volume, substance, and trajectory) and should not compromise responder safety.

7.2.9.2 Ongoing Response

For ongoing response activities, the plan must provide instructions or guidelines for the Incident Controller for planning the response. These should include:

- *Safety constraints*
- *Procedures for response initiation, implementation and termination*
- *Estimated resource mobilisation and deployment times*
- *Sources of proposed containment and response resources*
- *Procedures for obtaining approvals, where required*
- *Net Environmental Benefit assessments or NEBA procedures as appropriate*
- *Guidance for monitoring of operations*
- *Environmental constraints.*

7.2.10 Appendices

- **Emergency contact directory**. *A list of emergency contact details must be contained within the plan or a clearly indicated supporting document. It must include contact details for regulatory authorities and external response organisations in addition to the operators internal and offshore emergency contact details.*
- **Summary of pollutant behaviour**: *e.g. oil character and weathering and results of oil pollution modelling*
- **Environmental summary**. *This should be a "rapid reference" and may refer response personnel to other, more detailed, documents.*
- **Response capability maintenance procedures**, *including;*
  - *MPCP maintenance procedures*
  - *Equipment maintenance procedures*
  - *Training and exercise requirements.*

7.3 Supporting documents

7.3.1 Indicative response outline

An Indicative Response Outline (IRO) should be provided for the approval of a plan being submitted for the first time.

An IRO should set out, in chronological order (from incident reporting to demobilisation), the planned response to the facility's or operation's maximum credible spill scenario (i.e. highest level response). This should show:

- *Mobilisation sequence of resources, including equipment and personnel. This should clearly identify resources mobilised and deployed:*
  - *Immediate response.*
  - *Support resources.*
  - *Level 2 resources.*
  - *Level 3 resources (if applicable).*
- *Mobilisation timelines for the above including travel and commissioning times.*
- *List of all resources anticipated to be mobilised, including sources.*
- *Indicative (predicted) effectiveness, e.g. volume of oil dispersed/treated, containment and recovery volumes at key stages in the response. Note these should consider weathering of the oil.*
- *Oil mass balance, showing the above and fate of residual (untreated or uncollected) oil.*
- *Waste volumes anticipated to be generated, stored (including a list of containers), transported (including a list of resources and/or contractors) and disposed of (contractors or locations and methods).*
- *Logistics, including;*
  - *Transport of equipment and personnel.*
  - *Fuel supplies.*
  - *Food, drink and other personnel support needs.*

The above should include marine response, aerial response and shoreline response as identified in the risk assessment. This should be presented with supporting information.

7.3.2 Other documents

Supporting documentation that may be submitted with a MPCP may include:

- *Risk assessment.*
- *Spill trajectory modelling report.*
- *Oil (or HNS) analysis or, if oil type is not known, details outlining the selection of oil characteristics used in modelling.*
- *Oil or HNS behaviour (e.g. weathering) information.*
- *Blow-out Management Plan.*
- *Background details on chemical dispersant efficacy and testing and/or dispersant testing results.*
- *Justification of the acceptability of the chosen response strategies in the plan.*

- *Net environmental benefit assessment (NEBA) of dispersant use.*
- *Environmental Management Plans/ Environment Plan.*
- *Post spill monitoring plans (if not included in the Environment Management Plan/ Environment Plan.*
- *Wider information on environmental sensitivities.*
- *Evidence of spill response service providers e.g. aerial surveillance, containment and recovery services, waste management services.*
- *Emergency Response Plans (for hazardous substances spills).*
- *Crisis Management Plans.*
- *Emergency Finance Procedures and/or insurance details.*
- *Contracts with oil spill response support agencies or companies.*

Table 16 provides a checklist of contents (It is NOT a format or Table of Contents for a MPCP).

Table 16 - Checklist for marine pollution contingency plan contents

Contents		Comment / Explanation
Document Control	Title	Precise title stating location and the types of spills covered.
	Authority and responsibility	Person authorising plan and person responsible for maintaining the plan.
	Controlled copy number	A controlled copy number for each of the plans, if printed.
	Distribution List	A list that identifies the organisations that possess a controlled copy.
	Amendments list	Indication of when the plan was last amended, and which sections were amended.
	Table of Contents	Including tables and figures.
	Abbreviations & Acronyms	A list of abbreviations and acronyms that are used throughout the document.
Scope &Purpose	Aim & Objectives	Outline the aim and objectives of the Plan.
	Scope of Plan	Facility, operations, pollutants, risks (volumes) and area covered.
	Legislation or other requirements	Relevant international conventions, national and state legislation, or permit requirements.
	Interface with other plans	Show relationship and integration with other adjacent plans.
Preparedness	State/NT and National Plan arrangements	Authorities (Control Agencies and Statutory Authorities) levelled response and escalation procedures.
	Operator response organisation	IMT and integration with operator Crisis Management or other response teams.

Contents		Comment / Explanation
Response	Mobilisation	Including immediate response.
	Reporting and notification procedures	Including both internal (operator) and regulatory (government) requirements.
	Incident control	The function and tasks of the Incident Controller and key supporting roles.
	Health and safety	General H&S guidelines and procedures and any known specific hazards should be noted together with management procedures.
	Environmental management	This should include the role of environmental personnel in determining priorities, undertaking NEBA and for monitoring.
	Planning	Information management system should be noted.
	Operations	Marine, shoreline, aerial, waste management and wildlife response procedures and guidelines.
	Logistics	Sources of resources should be noted.
	Finance	Emergency finance procedures and cost tracking.
	Administration	Record keeping.
Termination	Procedures	Responsibilities should be noted.
	Demobilisation	Procedure and responsibilities should be noted.
	Post-incident review	Procedures should be noted.
	Post spill reporting and assessment	Operator requirements should be noted.
Appendices	Contact information	For key operator and government personnel, service providers and contractors.
	Charts and maps	As appropriate.
	Equipment and resource list	Provide a list of equipment available from the operator (Level 1) including both on site(s) and support equipment and also resources available within the region or state. Note: The list need not duplicate information available from AMSA.
	Forms and proformas	As required.
	Plan and response maintenance procedures	Plan custodian should be nominated. Revision/review schedule. Training and exercises. Auditing.
	Equipment maintenance	Responsibility. Auditing.
	Other supporting information.	As required.

8. Maintenance of the response capability

This section outlines the processes that should be established to maintain the required response capability.

8.1 Responsibility

Responsibilities for monitoring and maintaining the operator's response capability and for maintaining the MPCP should be assigned and documented within the MPCP or other document.

A management system including regular audits (frequency must be specified) and a training and exercise program must also be included. Key components of this are noted below.

8.2 Equipment

Operators should document a program for the maintenance of response equipment to ensure readiness. This may include:

- *A maintenance schedule.*
- *A schedule of replacement or rotation of equipment.*
- *An equipment audit program. This may include field deployment during exercises.*

8.3 Training

Operators must ensure sufficient trained personnel are available to respond to the identified pollution incident.

Operators must identify specific training needs and ensure sufficient personnel involved in the oil pollution incident response (from initial sighting to closure of response) have received appropriate training.

Operators must specify the identified training requirements within their contingency plans and the frequency at which refresher training will be carried out. This must include:

- *Equipment operators.*
- *Personnel to staff the Incident Management Team as stipulated in the MPCP.*

Nominated and trained personnel must be sufficient in number for management of the response including provision for relief shifts.

8.4 Exercises

Desktop and field exercises must be conducted to test that:

- *Resources are fit for purpose.*
- *Personnel are sufficiently trained.*
- *Response times indicated in the spill response plans are accurate.*
- *Deployment configurations are feasible.*

The MPCP should outline processes to ensure that lessons learned from exercises should be used to improve the response strategy and arrangements, the MPCP and future exercise programs.

The program of oil pollution incident exercises should focus on different aspects of the response strategy thus encouraging understanding of and familiarity with the MPCP.

A field deployment of all equipment and response personnel should be undertaken at least once per year. This should not include exercises undertaken outside of the operator company or agency.

Note – A successful deployment of equipment may be required as a condition of approvals for new permits, licenses etc.

8.5 Record keeping

Each operator must keep a record of all training and exercises undertaken by, or for the operator.

This must be maintained at the location where the exercise was conducted either on or offshore.

Records should include: exercise scenario, aims of the exercise, lessons learnt and actions put in place in response to the lessons learnt.

9. Approvals and review

This section outlines the information which should be submitted to government departments or agencies which either approve or assess Marine Pollution Contingency Plans.

9.1 Approvals process

The operator should identify all government stakeholders that have a regulatory approval role. This should be conducted as part of establishing the regulatory context for the MPCP (section 3).

The operator should have ready to submit the information listed at Table 17 in support of the MPCP for the consideration of the relevant regulator.

Table 17 - Checklist for submission of marine pollution contingency plan for approval or review

Ref	Item/Document	Status	Hard Copy		Digital Copy		Check/ Date
			Number	Format	Number	Format	
1	Marine Pollution Contingency Plan and Appendices (Table 16)	Required					
2	Indicative Response Outline (IRO) (section 7.3.1)						
3	Risk assessment	Optional but may be requested by approving authority					
4	Spill trajectory modelling report						
5	Oil (or HNS) analysis or details of selection criteria for oil type used in modelling						
6	Oil or HNS behaviour (e.g. weathering) information						
7	Blow-out Management Plan						
8	Details on chemical dispersant efficacy and testing						
9	Justification/discussion on the acceptability of the chosen response strategies in the plan						
10	Net environmental benefit assessment (NEBA) of dispersant use						
11	Environmental Management Plan/Environment Plan						
12	Post-spill monitoring plans (if not included in the Environment Management Plan/ Environment Plan).						
13	Wider information on environmental sensitivities						
14	Evidence of spill response contracts						
15	Emergency Response Plans						
16	Crisis Management Plans						
17	Emergency Finance Procedures and/or insurance details						
18	Contracts with oil spill response support agencies or companies						

Appendix A – Glossary

Term	Meaning
AFZ	Australian Fishing Zone.
AIP	Australian Institute of Petroleum.
AHV	Anchor Handling Vessel.
AIIMS	Australian Inter-service Incident Management System.
AMOSC	Australian Marine Oil Spill Centre.
AMOS Plan	Plan maintained by Australian petroleum companies to provide co-operative arrangements for response to marine pollution incidents.
AMSA	Australian Maritime Safety Authority
ANZECC	Australia and New Zealand Environmental and Conservation Council
API Gravity	An American Petroleum Institute measure of density for petroleum. API gravity = [(141.5/specific gravity at 16ºC) - 131.5]. Fresh water has a gravity of 10º API. Heavy oils are <25º API; medium oils are 25º to 35º API; light oils are 35º to 45º API; condensates are >45º API.
API	American Petroleum Institute.
APPEA	Australian Petroleum Production and Exploration Association.
Aromatic hydrocarbons	Hydrocarbon compounds that have at least one benzene ring as part of their chemical structure. The small aromatics (one and two rings) are fairly soluble in water, but also evaporate rapidly from spilled crude oil. Larger aromatics (PAHs) show neither of these behaviours to any extent.
Appraisal well	Well drilled after the discovery of oil or gas to establish the limits of the reservoir, the productivity of wells in it and the properties of the oil or gas.
Asphaltenes and Resins	Complex hydrocarbon compounds containing nitrogen, sulphur, and oxygen. Neither group evaporate at sea, disperse or degrade, and both groups stabilise water-in-oil emulsions when they are present in quantities greater than approximately 3%.
AuSAR	Australian Search & Rescue, a division of AMSA.
BAOAC	Bonn Agreement Oil Appearance Code.
bbl	Barrels (1 barrel = 159 litres or 42 US gallons).
BER	Boom encounter rate.
Bioaccumulation	Accumulation of chemical substances from water by aquatic organisms, by all processes including direct uptake or through consumption of food containing the chemicals.
Bioconcentration	Process by which there is a net accumulation of chemicals directly from water into aquatic organisms resulting from simultaneous uptake (e.g. by gill or epithelial tissues) and elimination.
Biodegradation	Degradation of organic matter by bacteria of fungi. Petroleum biodegradation is generally limited to shallow substrates and waters and conditions where oxygen and other nutrients (nitrogen and phosphates) are available to the aerobic bacteria.
BOP	Blowout Preventer.
Bunker fuel	Residual fuel oil or middle distillates used for bunkering ships.
CA	Control Agency
CoA	Commonwealth of Australia.
Condensate	Very light oil with an API gravity greater than 45º (SG of approximately 0.80).
CMP	Crisis Management Plan.
CMT	Crisis Management Team.
cP	Centipoise (measure of viscosity).

Term	Meaning
CSCP	Chemical Spill Contingency Plans
cSt	Centistokes 1cSt =1mm^2/sec (Kinematic viscosity) – a measure of resistance to flow (see also Viscosity).
DA	Designated Authority.
Development well	A well drilled for the future extraction of reservoir hydrocarbons.
Density	Mass per unit volume of a substance. Temperature-dependent. Oil will float on water if the density of the oil is less than that of the water.
DFAT	Department of Foreign Affairs & Trade
Dispersant	A chemical used to reduce the surface tension between two liquids.
DOE	Department of Environment www.environment.gov.au
E&P	Exploration and Production
EEZ	Australian Exclusive Economic Zone
Ecotoxicity	The inherent potential or capacity of a material to cause adverse effects in a living organism.
EIA	Environmental Impact Assessment.
EMA	Emergency Management Australia.
EMP	Environmental Management Plan.
EMS	Environmental Management System.
Emulsions	An intimate mixture of two liquids that are not miscible, e.g. oil and water. A water-in-oil emulsion is a stable dispersion of small droplets of water in oil. Emulsions formed from oil spilled at sea can have significantly different characteristics to those of their parent petroleum products.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999.
ER	Emergency Response.
ERA	Environmental Risk Assessment – a structured approach to comparative risk assessment for that compares the possible response strategies to determine which one(s) results in the best environmental gains, or at least identifies the least damaging strategy; often using the option of leaving the oil to weather and disperse naturally as the base case.
ERP	Emergency Response Plan.
ESC	Environmental and Scientific Coordinator.
Exploration well	A well drilled into a geological structure to determine the presence of hydrocarbons.
Flash Point	Lowest temperature at which a substance will produce a vapour/air mixture that is ignitable when exposed to an open flame (parameter that is determined under specified test conditions).
FPSO	Floating Production Storage and Offloading vessels.
FWADC	Fixed Wing Aerial Dispersant Capability.
GIS	Geographical Information System.
GPS	Global Positioning System.
HAZMAT	Hazardous materials.
HC	Hydrocarbon.
HNS	Hazardous and Noxious Substances.
HSE	Health, Safety and Environment.
IAP	Incident Action Plan – specific response plan of the IC during a response and must be consistent with the MPCP.
IC	Incident Controller
ICS	Incident Control System.

Term	Meaning
ICSC	International Chemical Safety Card.
IGA	National Plan Inter-Governmental Agreement.
Immediate response	A response initiated within 1 hour of a spill report. An immediate response includes an On Site Response - also known a first strike (USA)
IMO	International Maritime Organization.
IMT	Incident Management Team.
IPIECA	International Petroleum Industry Environmental Conservation Association. www.ipieca.org/
IRO	Indicative Response Outline.
ITOPF	International Tanker Owners Pollution Federation. www.itopf.org/
Level 1	An incident that can be controlled by the resources available at a facility or of the responsible party. These may include an operators on-site resources and supporting resources.
Level 2	An incident that is beyond the resources of the facility and of the responsible company (the operator). Incident control may be assumed by the nominated Combat Agency under the National Plan or the relevant State Plan.
Level 3	An incident that is beyond the resources of the facility and State resources. A national response under the National Plan. External assistance is required.
LNG	Liquefied Natural Gas. Natural gas that has been liquefied by refrigeration or pressure.
LPG	Liquefied petroleum gas. A mixture of light hydrocarbons that is gaseous at normal temperatures and atmospheric pressure. Generally consists of propane and butane. Liquefied by refrigeration or pressure.
MARPOL	International Convention for Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978
MERCOM	Marine Emergency Response Commander (Commonwealth).
MODU	Mobile Offshore Drilling Unit.
MPCP	Marine Pollution Contingency Plan. A document setting out an operator's response policy, aims and objectives, strategies and resources for the maintenance of response preparedness and for response. Note this is a generic term that encompasses response documents including those that may be referred to as: • Coastal Contingency Plan (CCP). • Oil Pollution Emergency Plans (OPEP). • Oil Spill Contingency Plan (OSCP). • Marine Oil and Chemical Spill Contingency Plan (MOCSP). • Marine Oil Spill Contingency Plan (MOSCP). • Marine Oil Spill Response Plan (MOSRP) • Marine Pollution Response Plan (MPRP) • Marine Spill Contingency Action Plan (MSCAP).
MRCC	Marine Rescue Coordination Centre.
MSDS	Material Safety Data Sheet.
NATA	National Association of Testing Authorities, Australia.
National Plan Arrangements	Framework policy and operational structure around the implementation of the National Plan.
National Plan	Australian National Plan. Sometimes also referred to as NATPLAN.

Term	Meaning
NEBA	Net Environmental Benefit Analysis – a tactical approach to determining the relative effectiveness of specific response options on particular resources during a response. Provides recommendations for action to populate the Incident Action Plan. See also RRA.
NFA	National Food Authority
NHMRC	National Health and Medical Research Council
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority. www.nopsema.gov.au/
NPSCC	National Plan Strategic Coordination Committee
NRT	National Response Team.
Offshore installation	Any fixed or floating offshore installation or structure engaged in gas or oil exploration, production or processing activities, or the storage, loading or unloading of oil. This includes drilling rigs, offshore platforms, Floating Production Storage and Offloading vessels (FPSO) and Floating Storage Units.
Oil	Hydrocarbons in any liquid form including crude oil, fuel oil, sludge, oil refuse, refined products and condensates Also including dissolved or dispersed hydrocarbons whether obtained from plants or animals, or mineral deposits or by synthesis.
Oil facility	Any facility which presents a risk of an oil pollution incident. This includes offshore installations, oil terminal, pipelines and any other facility handling oil.
Oil pollution incident	An occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil and which poses or may pose a threat to the marine environment, or to the coastline or related interests of the and which requires emergency action or other immediate response.
Oil Spill Contingency Plan (OSCP)	An emergency plan (other than the National Contingency Plan) setting out arrangements for responding to incidents which cause or may cause marine pollution by oil, with a view to preventing such pollution or reducing or minimising its effects
OIM	Offshore Installation Manager.
On Scene	At the location of the field response, e.g. at the location of a marine pollution incident.
On scene Response.	The components of a response located at the scene i.e. at the location of the pollution slick or plume.
On site	At the location of a facility, operation i.e. the spill or incident source.
On Site Resources	Oil spill response\ resources located close to the spill source. Able to be deployed within 1 hour of a spill report (see “Immediate Response”).
Operator	A company (or person) responsible for the management of an oil facility or activity. In terms of legal compliance under the OPGGA, 2006 this may be the “Titleholder” as defined under that Act.
OPEP	Oil Pollution Emergency Plan (OPRC term).
OPRC	Oil Pollution Preparedness, Response and Cooperation Convention.
OSCP	Oil Spill Contingency Plan.
OSRICS	National Plan Oil Spill Response Incident Command System.
OSR	Oil Spill Response.
PIC	Person in Charge.
POB	Personnel On Board (aircraft, vessel or offshore facility)

Term	Meaning
Pollution	Any emission or discharge to the environment, other than those occurring from natural sources and causes, which will, or may cause harm to the environment.
POLREP	Marine pollution incident report.
Pour Point	The lowest temperature at which the liquid will flow, under standard test conditions.
PPB	Parts per billion
PPE	Personal Protective Equipment.
Reportable incident	For a Titleholder of an offshore oil and gas activity; an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage. (Offshore Petroleum and Greenhouse Gas Storage (Environmental) Regulations, 2009).
RRA	Response risk assessment – a process to assess the relative effectiveness of any specific response strategy within a MPCP. The strategic version of NEBA.
SAR	Search and Rescue.
SITREP	Situation Report.
SOPEP	Shipboard Oil Pollution Emergency Plan.
Subsea Tieback	The process of connecting a new oil or gas discovery to an existing production facility.
Supporting resources	Operator resources not located on-site but able to be deployed to the scene within or before On Site Resources are exhausted. Suggest 1 hour deployment definition,
Toxicity test	The means by which the toxicity of a substance is determined. Used to measure the degree of response produced by exposure of test species to a specific level of stimulus (or concentration of chemical) under controlled conditions.
Viscosity	Measure of a fluid's resistance to flow; the lower the viscosity of a fluid, the more easily it flows. Viscosity of oils can be affected by temperature such that as temperature decreases, viscosity increases.
Waxes	Waxes are predominantly straight-chain saturates with melting points above 20°C.
ZPI	Zone of potential impact.
ZPEI	Zone of potential environmental impact.
ZPRI	Zone of potential response impact.

Appendix B – References and further reading

Not otherwise provided in context throughout the Guideline.

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