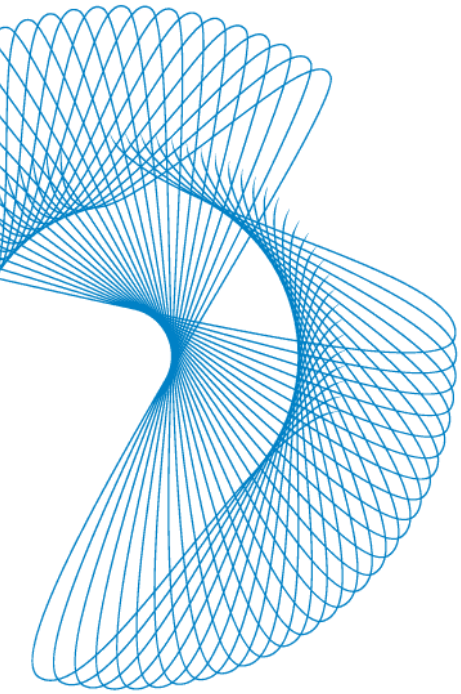
MARITIME NEW ZEALAND



An Introduction to Marine Pollution Response

For Marine Oil Spill Response Support Roles

AN INTRODUCTION TO MARINE POLLUTION RESPONSE

Contents

PURPOSE

The purpose of this document is to provide an introduction to the New Zealand marine oil spill response system for people who may fulfil response support roles. It provides an overview on why and how we respond to oil pollution incidents that may threaten New Zealand's marine waters and 15,134 km of coastline.

BACKGROUND

Maritime New Zealand – Who are we?

Maritime New Zealand (MNZ) is a Crown Entity established in 1993 under the name Maritime Safety Authority. It was renamed Maritime New Zealand in July 2005. MNZ is governed by an independent authority. Appointed by the Government, the five-member authority directs overall strategy, and appoints the Director of Maritime NZ who manages the organisation.

Maritime New Zealand's role is to make life at sea safer; to protect the marine environment from pollution, safeguarding it for future generations; to ensure New Zealand ports and ships are secure; and to provide a search and rescue service that people can call upon to assist them in one of the largest search and rescue areas in the world.

MNZ's mission statement is:
"To lead and support the maritime community to take responsibility for ensuring safe, secure and clean seas"

Marine Pollution Response Services – Who are we?

Marine Pollution Response Services (MPRS) is a division of MNZ charged with maintaining a nationwide capability for dealing with marine oil spills in New Zealand waters. It consists of a small team of specialists based in Auckland who manage and co-ordinate equipment maintenance, contingency planning, and response training and exercising, for people and organisations likely to be involved in response to marine oil spills.

What is a marine oil spill?

A marine oil spill is an actual or probable release, discharge or escape of oil from a ship or installation, or unsourced, into NZ waters other than inland, i.e. below the landward side of the Coastal Management Area boundary. The only exception is when it is inevitable that a spill into inland waters will end up in internal or marine waters. Any preparedness and response activity must be governed by the Maritime Transport Act 1994 (MTA).

Why do we respond?

The International Convention on Oil Preparedness, Response and Co-operation 1990 (OPRC) explained below gives Maritime NZ the mandate for marine pollution response which includes levying the oil and shipping industry to fund the preparedness and response regime.

MNZ and the regional councils are legally obliged to respond to a marine oil spill under the Maritime Transport Act. The New Zealand public expects that all reasonable steps will be taken to minimise the effect of any spill.

Oil spills have the potential to severely impact the marine environment. An effective response can significantly reduce the environmental impact of an oil spill.

OPRC Convention

The OPRC convention is the fundamental driver for the marine oil spill response regime in New Zealand. New Zealand has been a signatory to the convention since 1999.

Key objectives of the OPRC convention are that signatories have:

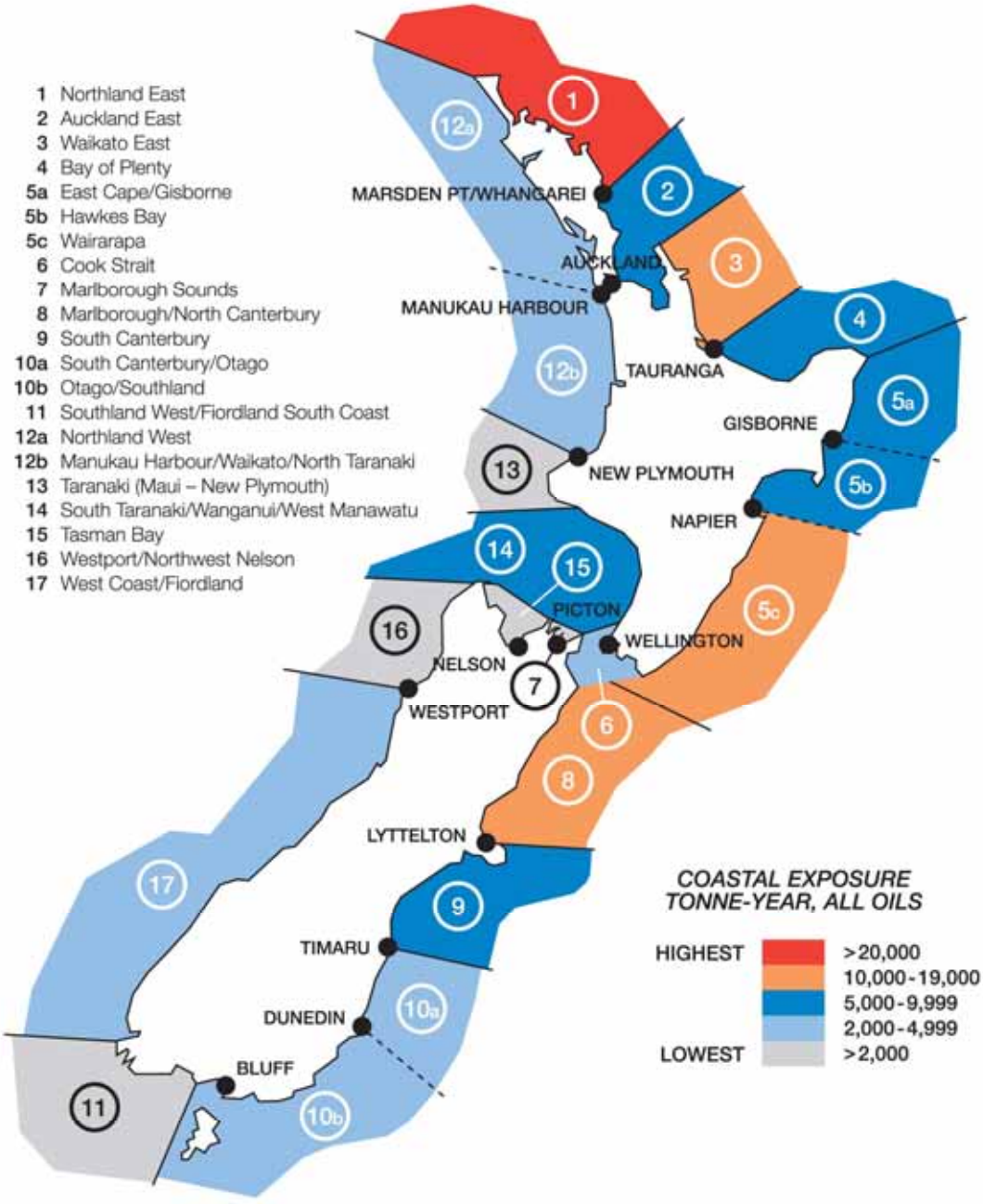
- A national system for responding promptly & effectively to oil pollution incidents established individually or through bilateral or multilateral co-operation
- Designated national authorities responsible for preparedness & response
- Local contingency plans to be co-ordinated with the National plan
- Minimum level of pre-positioned equipment appropriate to the risk assessment
- Programme of exercising & training

National Marine Oil Spill Risk Assessments

Risk assessments are undertaken prior to each review of the marine oil spill response strategy (usually 6 yearly). This process began in 1992, and each successive assessment builds on and refines the previous studies. These findings drive the strategic process for oil spill response planning.

Spill Likelihood

The likelihood of a marine oil spill has been modelled using information from the oil and transport industry in New Zealand and depicts regional information on spill potential (see map below), average frequency of a serious incident, expected number of spills per year, estimates of the oil spilled into the sea per year and the return period of a spill of a given size.


1 Northland East
2 Auckland East
3 Waikato East
4 Bay of Plenty
5a East Cape/Gisborne
5b Hawkes Bay
5c Wairarapa
6 Cook Strait
7 Marlborough Sounds
8 Marlborough/North Canterbury
9 South Canterbury
10a South Canterbury/Otago
10b Otago/Southland
11 Southland West/Fiordland South Coast
12a Northland West
12b Manukau Harbour/Waikato/North Taranaki
13 Taranaki (Maui – New Plymouth)
14 South Taranaki/Wanganui/West Manawatu
15 Tasman Bay
16 Westport/Northwest Nelson
17 West Coast/Fiordland
MARSDEN PT/WHANGAREI
AUCKLAND
MANUKAU HARBOUR
TAURANGA
GISBORNE
NEW PLYMOUTH
NAPIER
PICTON
WELLINGTON
NELSON
WESTPORT
LYTTELTON
TIMARU
DUNEDIN
BLUFF
COASTAL EXPOSURE
TONNE-YEAR, ALL OILS
HIGHEST
LOWEST
>20,000
10,000 - 19,000
5,000 - 9,999
2,000 - 4,999
>2,000

NEW ZEALAND INCIDENCE SPILLS BY CAUSE 1995 – 2007

	< 100 litres	100 litres – 1 tonne	1 Tonne – 10 tonnes	> 10 tonnes	Total
OPERATIONS					
Bunkering	40	91	43	1	174
Bilge Discharge	18	43	28	0	89
ACCIDENTS					
Collisions	0	1	1	1	3
Capsize	0	2	0	0	2
Grounding	1	1	6	2	10
Sinking	3	8	13	0	24
Other/unknown	151	112	61	2	326
TOTAL					628

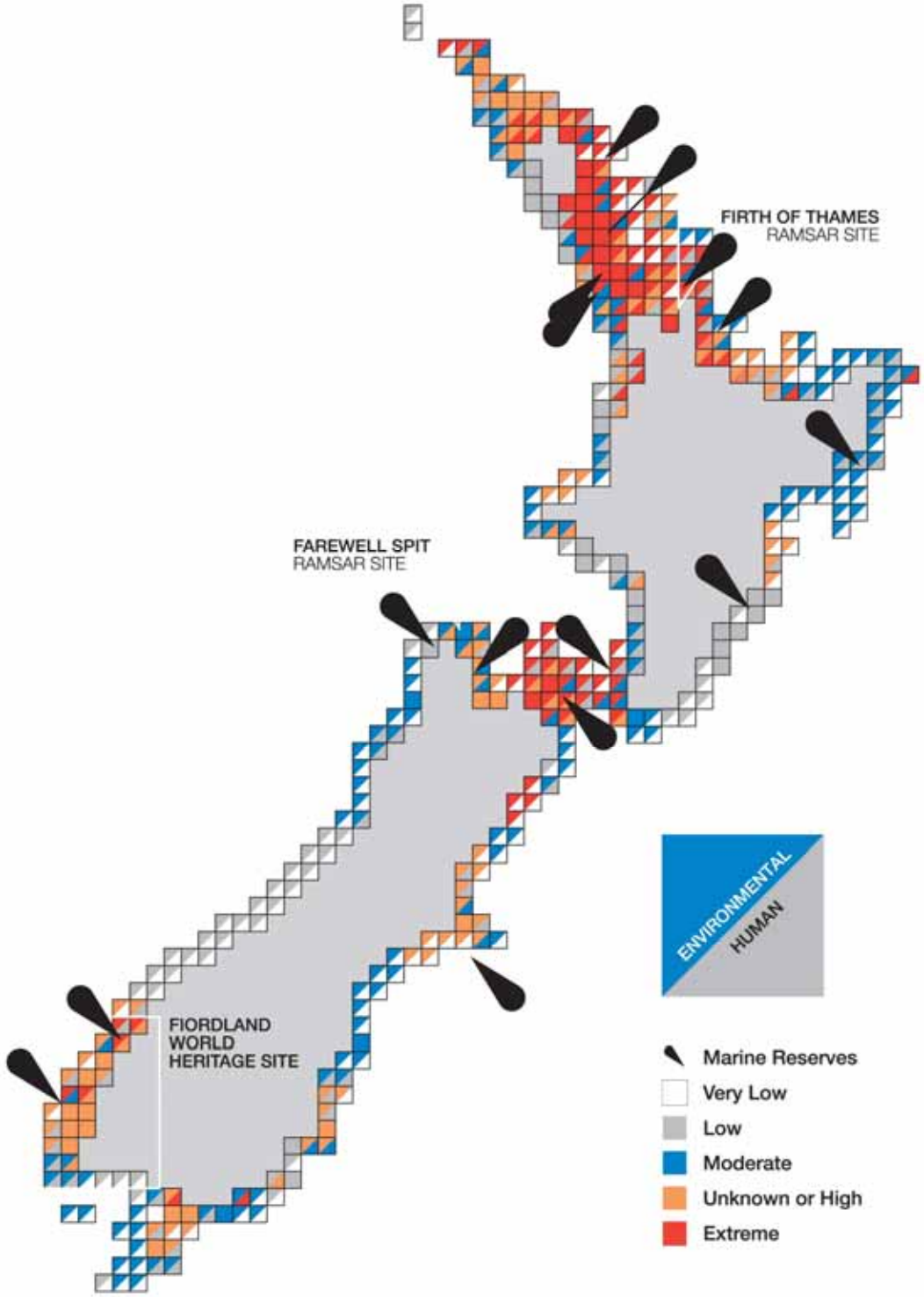
INTERNATIONAL INCIDENCE SPILLS BY CAUSE 1974 – 2003

	< 7 Tonnes	7-700 Tonnes	> 700 Tonnes	Total
OPERATIONS				
Loading/Discharging	2812	326	30	3168
Bunkering	548	26	0	574
Other operations	1177	55	0	1232
ACCIDENTS				
Collisions	167	274	95	536
Groundings	228	212	114	554
Hull Failures	572	88	43	703
Fire & Explosions	85	11	29	125
Other/unknown	2175	143	24	2342
TOTAL	7764	1135	335	9234

International data provided by OPRC

Spill Consequences

A framework for assessing the consequences of oil spills on coastlines has been developed based on earlier work. For this exercise, New Zealand is divided into a number of 20 km2 'coastal cells', and each cell is rated using a scale that assesses the vulnerability of the area to oil spills in terms of environmental factors, i.e. shoreline character, plants and animals, and human factors, i.e. economic, cultural, social, and recreational. These ratings produce a profile for each cell that contributes to the national spill consequences, (see map below).


FIRTH OF THAMES
RAMSAR SITE
FAREWELL SPIT
RAMSAR SITE
FIORDLAND
WORLD
HERITAGE SITE
ENVIRONMENTAL
HUMAN
Marine Reserves
Very Low
Low
Moderate
Unknown or High
Extreme

The areas that are of greatest environmental concern are those that have a high socio-economic value, have shoreline types that are very sensitive to oil spills e.g. mangroves in the Auckland and Northland regions, or those that contain important wildlife, e.g. birdlife on Farwell Spit.

Ports are hot spots. The economic resources, human population and recreational areas located in and around Auckland's ports contribute to that region showing as a hot spot. Also, the spill rate for ports is around 3 times higher than the spill rate for the combined coastal areas. The higher spill rate for ports reflects the greater risks associated with vessel movements in and out of harbours and the transfer of oil cargo and fuel. For NZ ports, Auckland has the highest spill rate, followed by Northland Ports, Lyttelton and Wellington. The Auckland rate reflects the high level of activity and the large range of vessels using the port.

In some locations the likelihood of a spill is relatively low because of the low level of risk-producing activity. However, areas that fit into this category may be classified as being at significant risk due to the potentially high consequences of a pollution event. An example of this is Fiordland with its combination of remoteness, unique ecosystems, scenic beauty, and world heritage status.

Contingent Capability

MNZ, in conjunction with its various national and international partners, will respond to a spill of any size. However, it is more cost-effective for New Zealand to maintain a response capability for the most likely spills, and to be able to call on other countries for extra equipment and trained personnel when needed for major spills. New Zealand has developed a domestic response capability for a 'one-in-a-hundred' year event based on successive risk assessments. The actual spill size planned for is impossible to specify, since there are too many variables to ascertain a credible estimated figure.

The concept of contingent capability in New Zealand means that each region has been equipped with sufficient resources to deal with the smaller spills they would normally experience, while still being able to escalate the response by calling on nationally held stocks and expertise for major incidents. In turn, when the scale of a response is beyond the national capability, New Zealand can call on Australian (and other) resources through a mutual aid Memorandum of Understanding or other signatories to the OPRC to assist. The system has the flexibility to accommodate the extra resources available from overseas.

STRATEGY

NZ Marine Oil Spill Response Strategy

The New Zealand Marine Oil Spill Response Strategy outlines the means by which the nation will respond to a marine oil spill of any size. However, few if any nations are able to mount credible responses to major spills without international assistance. Based on the results of comprehensive risk assessments, New Zealand maintains an appropriate domestic capability to respond to a 'one-in-one-hundred' year spill event. For larger spills arrangements are in place for international assistance though the provisions of the OPRC. New Zealand's own commitment to assist its international partners in times of need is also fundamental to the ongoing success of these reciprocal agreements.

Key Principles of the Strategy

The three most important and fundamental principles underlying the strategy are that:
The response capability will be maintained and developed through successful relationships and partnerships between MNZ, regional councils and unitary authorities, government partners, industry and domestic and overseas agencies.
Protection of human safety, health and welfare is of paramount importance in preparing and responding to marine oil spills. This includes the health and safety of the public, industry personnel and of the spill responders.
Net Environmental Benefit Analysis (NEBA) will underpin the decision making process concerning response options and clean-up standards.

RESPONSE SYSTEM

Three-Tiered approach

Consistent with established international practice, New Zealand has implemented a three-tiered approach to all aspects of marine oil spill preparation and response.

Together with the 17 regional councils/unitary authorities throughout the country, MNZ has a team of over 400 trained responders in addition to the local marine industry, some of which have also attended MNZ training courses.

Industry (Tier 1), regional councils (Tier 2) and MNZ (Tier 3) all have clear roles and responsibilities provided for in the MTA. Any agency with Tier 1, 2 or 3 responsibilities must develop and maintain both a marine oil spill contingency plan and an operational response capability.

To compliment MNZ's response capability there are memorandums of understanding (MOUs) and agreements for assistance with Regional Councils, industry, the Australian Maritime Safety Authority and the New Zealand Defence Force.

The vast majority of oil spills in New Zealand marine waters are relatively small and occur within the 12 nautical mile Territorial Sea. Most of these spills fall into the Tier 2 category and are dealt with by MNZ trained regional response teams.

Contingency Plans

Contingency plans must be produced according to standards provided in the Maritime Transport Act (MTA), Marine Protection Rules and any guidelines issued by the Director. Each regional, site or installation plan must also be consistent with the NZ Marine Oil Spill Response Strategy and the National Marine Oil Spill Contingency Plan. They should also identify any delegated powers and the responsibilities of all those involved in an oil spill incident response.

Plans are dynamic, living documents subject to regular and continual update. Formal review is required every three years, or earlier if circumstances demand. A review must also occur after every significant oil spill incident or exercise.

Tier 1

A Tier 1 plan is site-specific and includes most onshore industry with oil transfer sites, offshore installations (including rigs and platforms), pipelines and certain vessels from which a spill of oil into the marine environment is possible. Examples of Tier 1 sites range from diesel fuel pumps on refuelling jetties through to Marsden Point Refinery and offshore installations, i.e. anywhere where oil is transferred to or from the shore.

All vessels that meet the criteria specified by the MARPOL 73/78 convention are required to have a shipboard oil pollution emergency plan (SOPEP). In effect this means that in New Zealand waters all tankers of 150 tons gross or more and other ships of 400 tons gross or more are required to have an approved SOPEP.

All Tier 1 sites and vessels are expected to be able to provide a clearly identifiable first response to pollution incidents for which they are responsible.

Tier 2

Each regional council is required to produce, maintain and implement a regional marine oil spill contingency plan for their part of the Territorial Sea (out to 12 nautical miles). MNZ will approve and audit these regional plans. Regional contingency plans should identify sensitive sites and preferred response options for the more likely spill scenarios.

Tier 2 response is the responsibility of Regional On-Scene Commanders (ROSC) appointed by the various regional councils and unitary authorities.

Tier 3

MNZ is responsible for producing and maintaining the National Plan. This includes the maintenance of the plan which contains operational procedures, which will be used in conjunction with the regional Tier 2 plans.

Tier 3 is the highest level of the response tiers. If additional response resources are required, international assistance may be requested from other countries and organisations that New Zealand has agreements with.

Tier 3 response is the responsibility of National On-Scene Commanders (NOSC) appointed by the Director of MNZ.

Tier Escalation

Tier 1 to tier 2

A ROSC may declare a Tier 2 response if he or she considers a spill is beyond the Tier 1 site's capability. The ROSC then becomes responsible for control of the response with his/her team of regional responders. A Tier 2 response may not be de-escalated to a Tier 1 response.

If the source of a spill within a region's waters cannot be identified, then a Tier 2 response will normally be declared even if the likely source is a Tier 1 site.

Tier 1 and 2 to Tier 3

Regional Council jurisdiction does not extend beyond the 12 nautical miles of the Territorial Sea and so any escalation of a Tier 1 response that is more than 12 miles offshore will always be to Tier 3. Maritime NZ employs 6 NOSCs on a duty roster who are available to provide advice to the Oil Spill Duty Officer and ROSCs as and when required, and take action when an escalation of response is appropriate.

The escalation of a response from Tier 1 or Tier 2 to Tier 3 occurs when the on-duty NOSC considers the situation warrants the declaration of a Tier 3 response. Typical reasons for escalation of a response to Tier 3 are when the site or regional resources are insufficient or the response costs are likely to be significant. A Tier 3 response cannot be de-escalated and so when a Tier 3 response is declared, the level of response and the responsibility of the NOSC remain until the response is terminated.

Regional (Tier 2) contingency plans are required to be consistent with the National (Tier 3) Plan and many sections of the plans are common. This is intended to ensure compatibility and also provides for a relatively seamless transition when a response is escalated from Tier 2 to Tier 3.

When the on-duty NOSC declares a Tier 3 response, he or she also takes immediate command of the incident. A Tier 3 declaration will normally prompt the mobilisation of the National Response Team which upon arrival at the incident location, will combine with the regional team to form an integrated Tier 3 response team under the command of the NOSC.

A Deputy NOSC may be appointed to cover the NOSC whilst he or she is en-route to the incident location. During that time the NOSC or Deputy NOSC may require the ROSC to undertake particular tasks such as:

- an immediate assessment of the spill and immediate actions
- protection of threatened sensitive resources
- establish an incident command centre (ICC)
- prepare a draft incident action plan (IAP)
- undertake local notifications and mobilisation of additional resources

National Response Team

The National Response Team (NRT) consists of MNZ staff, contracted specialists, and approximately 40 trained personnel selected from the regional response teams that are available at short notice for any Tier 3 incident in New Zealand Marine Waters. The NRT includes a number of specialists such as environmental advisors, shoreline cleanup assessment teams (SCAT), wildlife responders, health and safety advisors, media/community relations advisors, and Tier 3 equipment operators. Appropriate members of the NRT are normally mobilised upon declaration of a Tier 3 response. However, members of the NRT may also be made available to assist ROSCs during Tier 2 incidents.

How Are We Funded?

The Oil Pollution Levy (OPL) is collected from the main risk creating elements of the maritime industry as provided for under the Act, in order to maintain the Oil Pollution Fund (OPF). The fund provides financial support for New Zealand's preparations for marine oil spill response throughout New Zealand, and pays costs for responding to spills where the source is unidentified.

The OPL is described in the Strategy as, "A differential levy imposed on all vessels carrying oil as cargo (tankers) or as fuel, according to a formula based on the risk of an oil spill from their particular operation. Offshore installations also pay a set levy based on an assessment of their contribution to the overall risk".

In addition to covering the costs of response preparedness and unsourced spills, the levy also provides a start-up fund for major Tier 3 incident response.

Cost Recovery

There is a cost associated with every oil spill. The MTA requires regional councils to recover all of their legitimate marine oil spill response costs from either the spiller (if known) or the Oil Pollution Fund (OPF), if necessary.

This means that regional councils shall take all reasonable steps to recover the response costs from a spiller. If the spiller cannot be identified despite all reasonable efforts or cannot or will not pay, then application may be made to the OPF for reimbursement of response costs.

Oil Pollution Advisory Committee

The Oil Pollution Advisory Committee (OPAC) is comprised of representatives from regional councils, port companies, shipping, the fishing and oil industries, Department of Conservation (DoC), Ministry for the Environment, Ministry of Transport, and Te Puni Kokiri. These are all statutory appointments made by the Government and are intended to provide representation for the risk creators and those organisations with an interest in marine pollution. The Committee is chaired by MNZ, normally the Director.

Key functions of the committee are to provide advice to MNZ on all matters associated with the New Zealand Marine Oil Spill Response Strategy and to provide advice on the levying and use of the Oil Pollution Fund.

RESPONSE STRUCTURE

Oil Spill Response in New Zealand is based on the same CIMS structure as Emergency Management organisations

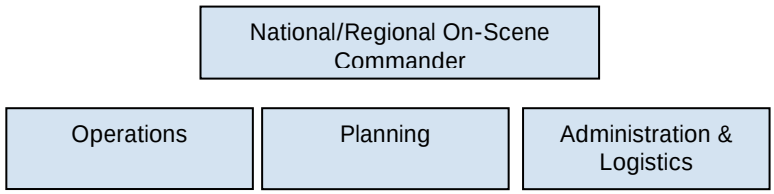
What is CIMS?

The Co-ordinated Incident Management System (CIMS) is a management protocol that has been used in NZ since 1998. It is a set of management rules that is common to all emergency service providers. Basic principles in CIMS include:

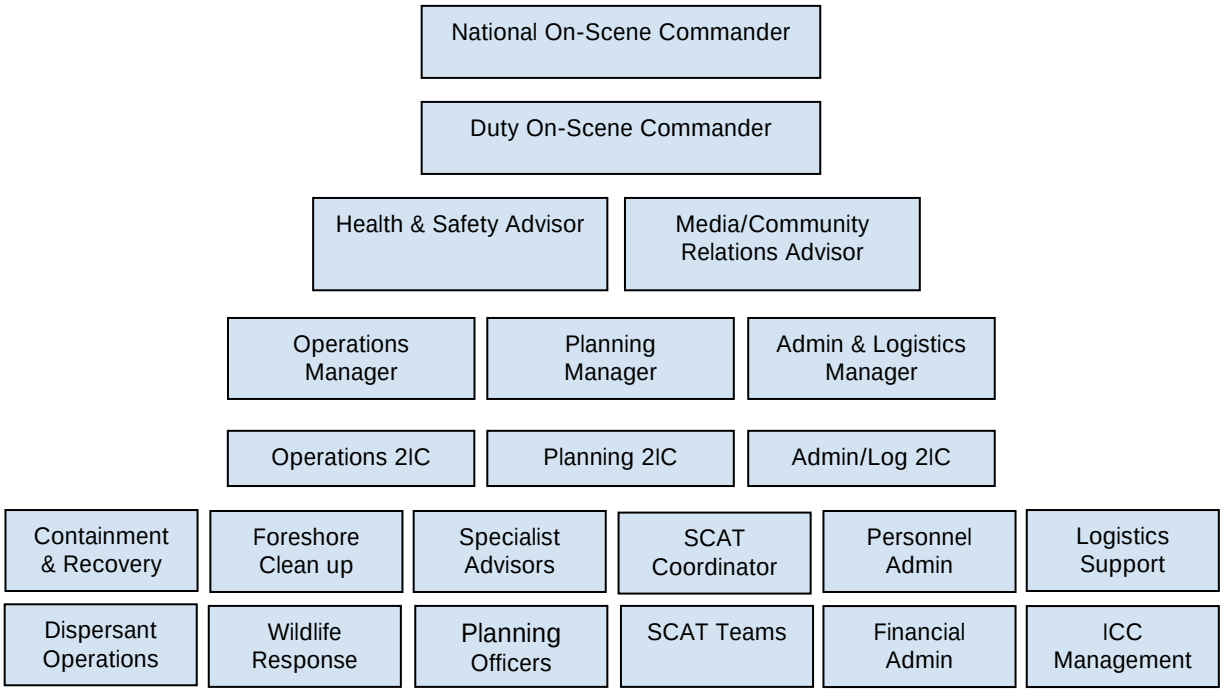
- Common terminology
- Modular organisation
- Integrated communications
- Consolidated Incident Action Plans
- Designated incident facilities

Examples of how the CIMS structure can be applied to all response levels

Basic Tier 2/3 Management Structure



Tier 3 Management Structure



ROLES AND RESPONSIBILITIES

Below are some of the key roles and responsibilities of the incident command centre.

National/Regional On-Scene Commander

- Manage & coordinate the response in accordance with statutory authority (MTA 1994)
- Minimise, and where possible prevent further pollution from the marine oil spill
- Take whatever measures necessary to disperse, contain and recover, or clean up the oil spill in accordance with the relevant contingency plan
- Ensure the response is conducted 'at reasonable cost'
- Terminate response (with consent of the Director for Tier 3 incidents)

Planning Manager

- Manage planning activities for OSC
- Production of spill assessment
- Produce IAP
- Management of planning staff
- Ongoing monitoring, reassessment & updating of plans

Operations Manager

- Manage operations for OSC
- Implementation of IAP operations
- Management of field staff & contractors
- Efficient use of resources
- OSH in the field

Admin/Logistics Manager

- Manage admin./log activities for OSC
- Personnel admin. & welfare
- Equipment supply, delivery & records
- Finance & cost tracking
- ICC management
- Demobilisation
- Records

Site Supervisor/Team leader

- Site operations plan and site safety plan
- Health and safety of all personnel on site
- Completion of allocated tasks
- Assigned personnel
- Allocated equipment
- Site admin. & logistics

RESPONSE OPERATIONS

Phases of an Oil Spill

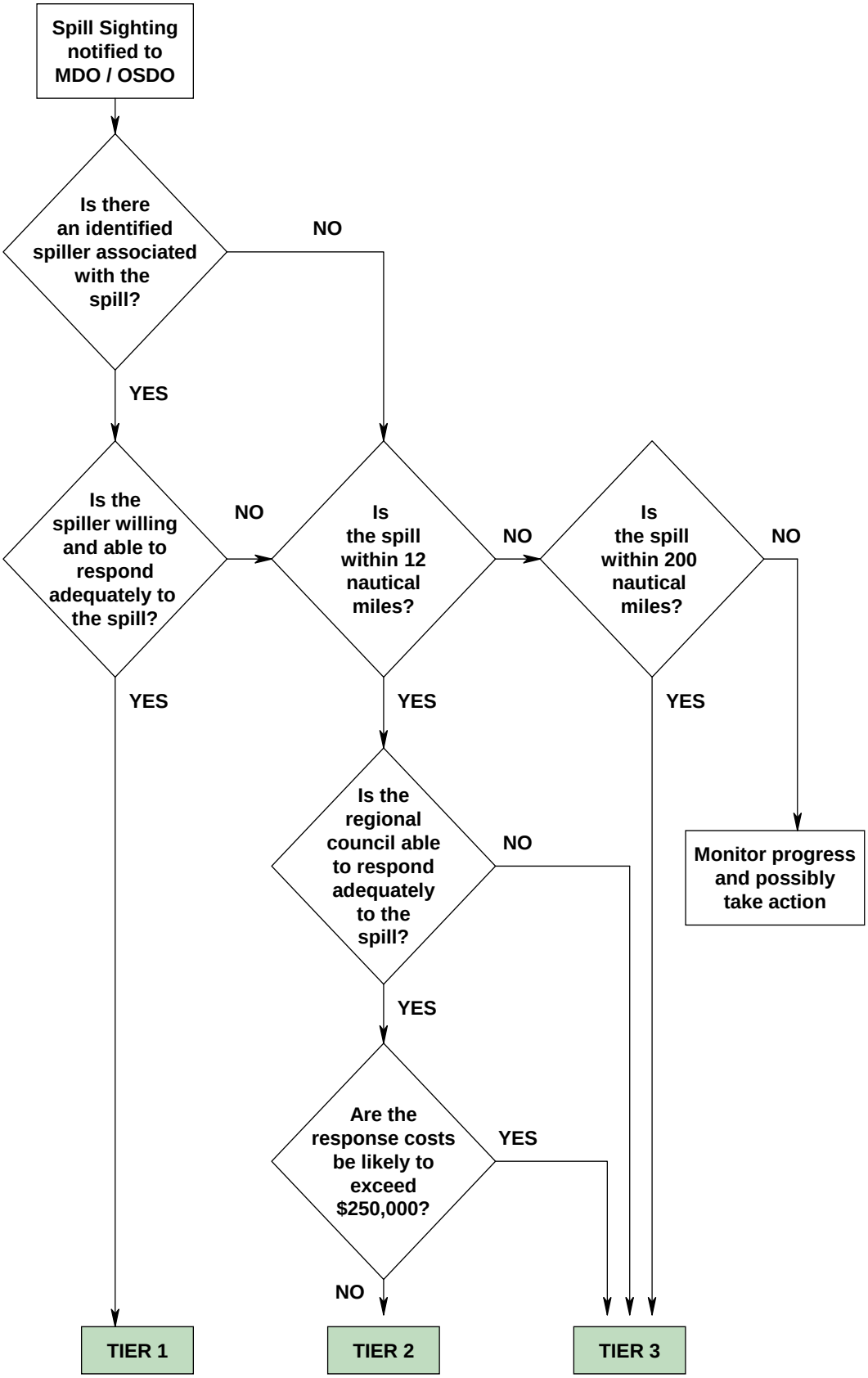
There are six phases of an oil spill response.

1. Reporting
   The MTA requires that all spills must be reported by the spiller.
   Spills within 12Nm should be reported to the Regional Council
   Spills outside 12Nm should be reported to MNZ

2. Notification
   Regional councils are required to notify MNZ of all oil spills within their region
   The Rescue Co-ordination Centre of New Zealand (RCCNZ) are the initial contact for reporting.
   The MNZ Oil Spill Duty Officer (OSDO) – provides 24/7, 365 days a year contact, support & liaison

3. Assessing
   Questions that need to be answered to assess a spill of any size:
   What is it? Where is it? Where is it going? When is it getting there? How much? What is in the way?
   What is happening to it (weathering)?

4. Responding
   The level of response must be determined, either Tier 1, Tier 2 or Tier 3



Once the level of response has been identified the response team will need to plan for the immediate response actions to combat the spill, prevent further loss of oil into the environment etc.
During the response the planning team will create an incident action plan. This consists of aims, measurable objectives and response actions to minimise the effect of the spill on the environment.

5. ## Response Termination

   The decision to terminate the response is ultimately the responsibility of the On-Scene Commander. However, in the case of a Tier 3 incident, the National On-scene Commander is required to obtain the approval of the Director before the response is terminated. Consultation with key stakeholders would also normally be undertaken before termination of a Tier 3 response. The spiller's liability ends when a response is terminated.

6. ## Post Operations Tasks

   The process of gathering evidence and recording full information on expenditure is of critical importance and should be commenced as soon as possible. A claim for cost recovery will be prepared after the spill response has been terminated and detailed information together with supporting documentary evidence is essential for this task. If the spiller is identified then they will be held liable for the cost of the clean up. If the spiller is unknown, then the OPF will normally cover the costs. In addition to the recovery of response costs, consideration will be given to whether or not any prosecutions under the MTA or RMA are appropriate.

After every significant oil spill response the appropriate contingency plan(s) are reviewed (Regional and/or National Plan) and any amendments or improvements as a result of the response are actioned

Response Equipment

MNZ owns over $12 million worth of oil spill response equipment including containment booms and oil recovery skimmers. This is distributed regionally in accordance with the risk assessment. The equipment is regularly maintained by the regional staff and/or contractors and is audited annually by MNZ equipment technicians.

RESPONSE TECHNIQUES

The principal clean up techniques are:

- Monitor & Assess – to assess and predict the movement and behaviour of the oil
- Containment – To collect or direct the oil
- Recover – To “skim” the oil off the surface of the water or to absorb oil with absorbent material
- Disperse – To remove the oil from the surface of the water by ‘mixing’ it into the water column.
- Shoreline Clean-up – To remove the oil from the shore

It is important to note that most clean-ups will combine a number of techniques.

Factors affecting the clean up technique are:

- Oiling conditions
- Physical environment
- Resources
- Site characteristics
- Waste generation potential

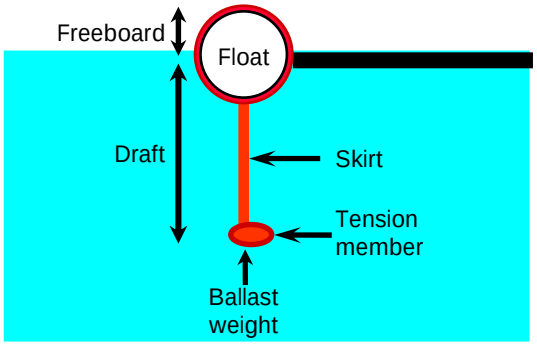
Monitor and Assess

The first purpose of the monitor and assess response option is to confirm spill – Is it oil? What is the source? To assess & predict the movement of the oil – Where is it going and what will be affected? To quantify volumes – How much oil are we dealing with? Where are the major concentrations? And to assist any other response techniques that may be implemented – response efficiency is improved by close monitoring.

Contain

What do booms do?

- The float sits above the water surface to collect oil
- The skirt of the boom sits under the water surface to collect oil being carried down under the float of the boom by the current
- The tension member and ballast hold the boom in an upright position



What can they be used for?

- To prevent oil spread
- To contain oil for collection
- To divert oil
- To protect sensitive resources

Types of boom available in New Zealand:

Sorbent Boom
- made of fibres that absorb oil not water
- disposable boom

Rapid Deployment Boom
- quick to deploy
- calm water use
- solid floatation

Fence Boom
- higher freeboard
- greater containment capacity
- foam flotation

Land/Sea Boom
- good stability
- good for shallow water and tidal interface
- air floatation with water ballast

Ro Boom
- largest freeboard
- most robust
- heavy duty inflatable boom

Recover

What do skimmers do?

A skimmer is any mechanical device specifically designed for the removal of oil (or oil/water mixture) from the surface of water without altering its physical and/or chemical characteristics.
Factors affecting skimmer use are oil type, viscosity, oil layer thickness, sea state and debris.

Types of skimmer available in New Zealand are:

Weir Skimmer

Supported by floats, the weir sits just under the surface of the water. Oil falls over the weir into central collection area and is pumped back to a collection point such as a frame tank on shore or a lancer (inflatable) barge whilst still at sea (see waste disposal section for photos)

Oleophilic Disc Skimmer

Oil is attracted to the rotating discs which are then wiped off into the central pump for collection.

Oleophilic – Rope Mop

Oil attracting fibres of the rope mop pick up oil, the rope then runs though a roller wringer system for collection.

Vacuum Skimmer

Oil is sucked up from the water surface to a sucker truck for transportation and disposal

DIP Skimmer

Dynamic Inclined Plane skimmer designed for maximum oil collecting efficiency with water movement of between 1-3 knots

Oil Recovery Vessel

The skimmer barges have primarily been designed for Tier 3 responses. This does not preclude use during Tier 2 incidents; the response to Tier 2 incidents will be governed by the cost of cleanup including the logistics to move a skimmer barge to a cleanup site, and the provision of suitably trained personnel to operate the barges.

The 3 ORVs are located in Northland (with New Zealand Refining Company), in Auckland as the mobile Tier 3 barge and Picton as cover for spills in the Wellington region as well as the rest of the South Island. The Marlborough based ORV represents a strategic location for the southern spills.

Disperse

What is dispersant?
Dispersants are a response tool to reduce shoreline and sea surface impacts of spilt oil. They are primarily used on large crude or fuel oil spills and are less toxic to the marine environment than many household dish washing liquids.

How do dispersants work?
Dispersants work by enhancing the natural process of dispersing oil into the water column. The dispersant reduces the size of the oil droplets and the wave action keeps droplets in the water column.

Why are oil spill dispersants used?
The principle aim is to stop oil from reaching shallow water and shorelines where most damage generally occurs.

What are the environmental benefits?
Dispersant use can remove oil from the surface of the water and prevent oil reaching sensitive areas. Dispersant can also be used to help prevent oil sticking to solid surfaces, enhance natural degradation and prevent emulsion (oil & water moose) formation.

What are the logistical benefits?
Recovery is the ideal response option, but this is often unsuccessful due to weather & sea state conditions. Also, the amount of waste generated is not always acceptable. A successful dispersant operation greatly reduces the amount of oily waste. Dispersant can often be the only response option on large spills, in rough water and strong currents.

What are the drawbacks of dispersant use?
As with any response option, there are always pros and cons. Not all oils are dispersible. Before any large scale dispersant operation is undertaken, the dispersibility of the oil should be tested. Dispersant increases the transfer of oil into the water column where it can impact subsurface species, affect water intakes and can taint seafood as the oil is not removed from the environment.

Shoreline Clean-up

What is shoreline clean-up?

Shoreline clean-up is the removal and disposal of spilt oil that has reached the shoreline. This response is the most labour intensive and expensive option due to the amount of people and machinery required and the amount of waste produced by oiled debris. Clean-up endpoints should be established so responders know what level of clean-up is required, and when to stop.

Shoreline clean-up is effective on a variety of shorelines. However, there are always safety and access issues for the responders.

There are three stages of shoreline clean-up:

Stage 1

- Removal of gross pollution and bulk oil, this requires a rapid response
- Techniques can include: (for stage 1 & 2)
    - Booms, skimmers, pumps
    - Water flushing
    - Manual clean-up (shovels)
    - Mechanical clean-up (front loaders)

Stage 2

- Removal of beached oil

Stage 3

- Final polish / aesthetic treatment
- Techniques can include:
    - Sorbents
    - Chemicals
    - Bioremediation
    - Leave alone

Waste Management

With most response options there will be oily waste. Consideration must be given to types and volumes of waste for temporary storage and local land fill permitting hydrocarbons and oiled waste material. Oily waste is more effectively managed by separating waste into different waste streams, such as liquid, solid, heavily or lightly oiled waste etc.

Frame tank
– shore based temporary storage

Lancer barge
– at sea temporary storage

INCIDENT SUPPORT ROLES

If you are involved in a marine oil spill response you could be involved in Media Relations, Finance or Document Management to name a few of the support roles within the Incident Command Centre.
Your tasks could include managing the initial media response for the incident and producing media releases, or to monitor the response expenditure for subsequent claims and audits or keep accurate records for health & safety requirements and public record or any other task as required by the On-Scene Commander.

CONCLUSION/SUMMARY

This overview of New Zealand's marine pollution response system is intended as a guide for those involved in support roles during a response. Members of response teams who are employed in field operations and management/decision-making roles are required to undertake formal training provided by MNZ.

It is recommended that persons in support roles attend regional exercises to observe field operations and the running of an incident command centre.

Persons who believe they require further training should in the first instance contact their regional training co-ordinator or regional on-scene commander.

Further information on New Zealand's marine pollution response system is available from regional on-scene commanders and the Marine Pollution Services Division of MNZ at PO Box 45209 Te Atatu Peninsula Auckland, telephone 09 834 3908.