



**ISO DOCUMENT**  
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# Risk Management Standard





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## Revision History

Document Revision Record					Approval
Rev	Date	Description	Prep	Check	Harbourmaster
1	10/2018	Document developed following review of SMS to better align with latest revision of PHMSC	LGR	JEV	10/2018
2	02/2018	Inclusion of title page and contents page. Amendments to ensure consistency of language. Table 1 adjusted to align with reality. Formatting.	LGR	JEV	02/2020

## Introduction

The purpose of risk management is to provide insight into potential problems, inform decision-making and optimise resource allocation. Activities of every kind face internal and external influences that make it uncertain whether, when and to what extent, they will achieve their objectives. The effect of this uncertainty on an activity's objectives is 'risk'. Inherent risk can be satisfactorily managed by identifying, anticipating, understanding and deciding whether to modify or accept risk. The Harbourmaster shall communicate and consult with stakeholders to monitor and review the risk and the controls that are intended to modify risk.

## Scope

The scope of this standard is to describe the risk management processes and practices that are used by the Harbourmaster to ensure safe maritime activity in the Marlborough harbour. The Harbourmaster shall communicate and cooperate with stakeholders in the management of maritime risk in Marlborough Harbour but this does not diminish the responsibility of all stakeholders to properly manage the maritime risks that they create or experience at any time.

## Risk Description

The terms hazard and risk are often used interchangeably; however, they have unique meanings. A Glossary is provided at the back of this standard to assist with establishing a common understanding of terms.

## What is Risk Assessment?

Risk assessment is a tool used to measure the potential extent of a hazard's harm and its likelihood to occur. Risk assessment conflates consequence and likelihood in the risk matrix to provide a semi-quantitative risk rating. This methodology is useful for comparing risks so as to make informed decisions about resource allocation. In short, risk assessment is a tool to determine what action to take next to keep the harbour safe.

## What is Risk Management?

At its most basic level, risk assessment (whether it be people, property, environment or reputation or any other form of risk that could harm something the people of Marlborough care about) boils down to analysing the answers to the following questions:

- What do we have that is going to hurt us?
- How bad is it going to be?
- How do we stop it from happening?
- How do we pick up the pieces?

Having analysed the answers to those questions, risk management becomes the evaluation of:

- Can we live with this?
- Can we do anything better?
- Can we do something else that is reasonable and practicable?

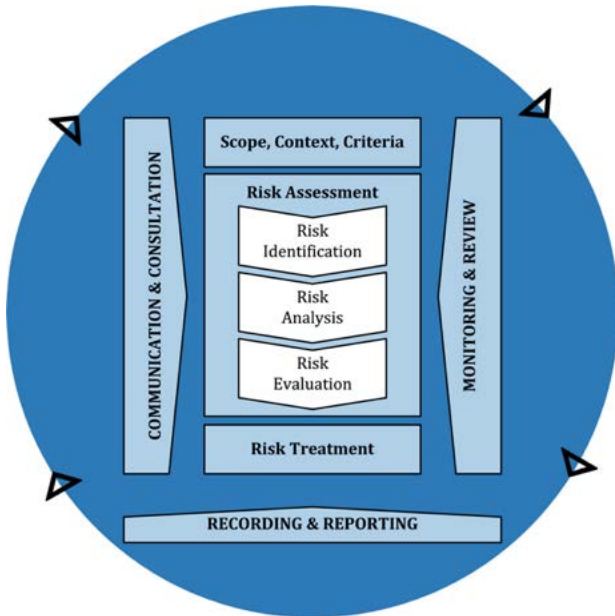
## Risk Management Process

The objective of a systematic risk management process is to ensure that, appropriate for the applicable context, the following is achieved:

- Risks are identified
- Risks are sufficiently assessed, properly managed and controlled
- Risks are reduced so far as is reasonably practicable
- Risk controls are selected in accordance with an appropriate hierarchy of risk controls

The ISO-31000:2018 risk management process is illustrated below.

**Risk Management**



Harbour Operational Health and Safety Plan available in the Councils Content Management System. These risks are managed in accordance with the Councils Risk Management Policy.

Hazards associated with maritime activity such as recreational boating, ship transits and port operations are addressed in the Operational Maritime Risk Register and associated Harbour Safety Plan. A key point to note is that the risk operational maritime register does not use the term Hazard. Rather, it identifies the incidents that we want to avoid (for example, grounding, foundering, oil spill) and then through the processes of risk assessment as outlined here, determines the necessary controls.

The value of this approach is that our operational maritime risk register can be directly linked to the harbour incident management system to form a dynamic and responsive risk management system. Both components are critical to risk management as the risk register reflects our assumptions about what might happen and the incident register shows us what is happening. A more detailed explanation is provided in the Harbour Safety Plan.

**Identified Hazards**

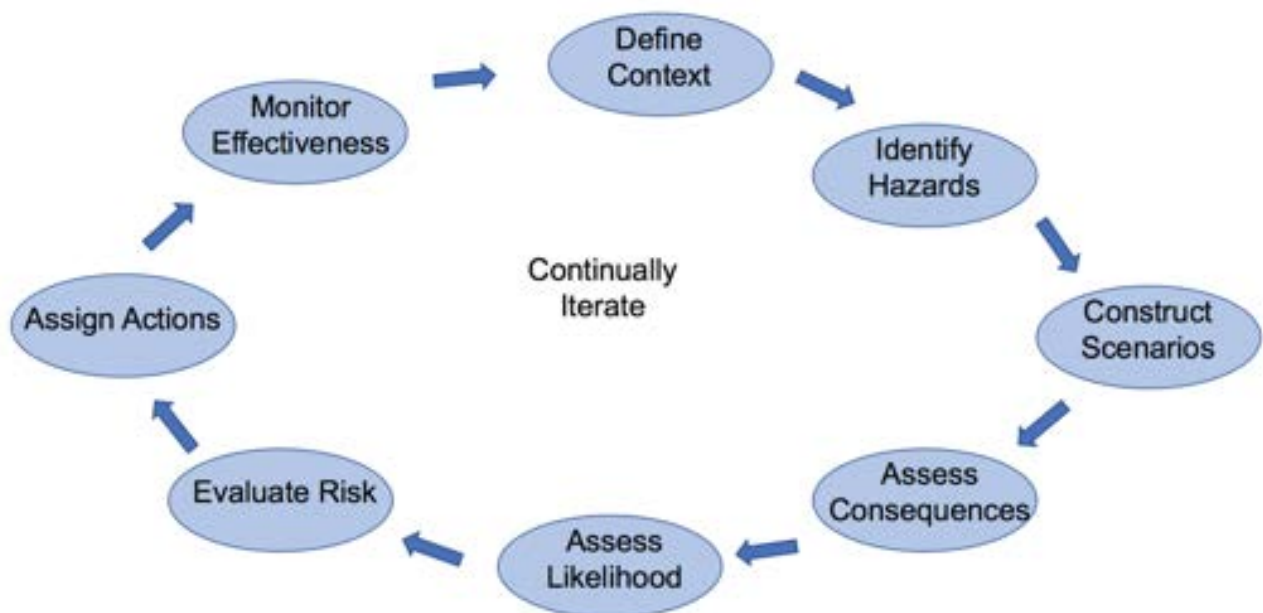
Identifying all credible hazards is critical to understanding overall risk. If a hazard is not identified it will not be assessed and may remain intolerably uncontrolled.

Hazards associated with workplace activities (health and safety hazards) are identified and recorded in the

**Incident Scenarios**

Risk analysis includes the identification of Marlborough’s maritime safety hazards by systematically evaluating scenarios that lead to unwanted consequences. This process considers all maritime activity known to occur in the harbour and all foreseeable future use scenarios. This is illustrated below:

**Scenarios**



# Risk Analysis

Risk analysis is often considered to be the product of a credible consequence with the likelihood of that consequence occurring. This may be expressed in the formula below:

$$\text{Risk} = \text{Consequence} \times \text{Likelihood}$$

To assist with the risk analysis, and to assure that risk analysis is consistent with the understanding of risk achieved, the following consequence and likelihood scales are used:

## Consequence

#	Title	Description			
		People	Property	Environment	Reputation
0	Eliminated	No injury No health affects	No attributable cost	No identifiable impact	No identifiable damage
1	Low	First aid or no treatment injury Minor health effects	NZ\$0-10,000	Negligible environmental impact. Tier 1 may be declared	No comment in media
2	Minor	Medical treatment required Restricted Work Injury or Illness (temporary)	NZ\$10K-100K	Tier 1 criteria reached Small operational spill	Bad local publicity Short-term loss of revenue
3	Moderate	Lost time injury Restricted Work Injury or Illness (permanent)	NZ\$100K-1M	Tier 2 Spill criteria reached, capable of being limited to immediate area within harbour	Bad widespread publicity Temporary navigation closure or prolonged restriction of navigation
4	Major	Multiple Lost Time Injuries or Single Fatality	NZ\$1M-10M	Tier 3 criteria reached, with pollution outside harbour or port zone expected. Chemical spillage or small gas release Potential loss of environmental amenity.	National Publicity Harbour temporarily closed, navigation channel / port movements affected for several days Loss of trade
5	Catastrophic	Multiple Fatalities Long term health impact Permanent harm health effects (single or multiple)	NZ\$10M+	Tier 3 criteria reached with international clean up support required Widespread beach contamination or Serious chemical\ gas release Significant threat to environmental amenity	International media publicity Port closes, navigation seriously disrupted for an extended period Serious long-term loss of trade

## Likelihood

#	Title	Description
0	Eliminated	Opportunity for harm eliminated through effective action
A	Rare	Exceptionally unlikely, even in the long term Never heard of in the marine industry
B	Unlikely	A very uncommon event but could occur Heard of in the marine industry
C	Possible	Might be expected to occur occasionally Has occurred in New Zealand Can be expected to happen once or more a year in the marine industry
D	Likely	Can be expected to occur frequently Has occurred within Marlborough Will probably occur in most circumstances
E	Frequent	Is expected to occur in most circumstances Can be expected to happen once or more a year in Marlborough

The operational maritime risk register identifies a range of maritime incidents that are known to occur in the marine context and then considers the maximum credible event (MCE) that might reasonable be expected to occur in Marlborough. The likelihood and consequence of the MCE can be assessed using the table below.

## Risk Matrix

		Consequence					
		Eliminated 0	Low 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	Rare A	A0	A1	A2	A3	A4	A5
	Unlikely B	B0	B1	B2	B3	B4	B5
	Possible C	C0	C1	C2	C3	C4	C5
	Likely D	D0	D1	D2	D3	D4	D5
	Frequent E	E0	E1	E2	E3	E4	E5

## Risk Evaluation

Risk evaluation is the comparison of the risk value with the Marlborough risk acceptability criteria. We use the product of consequence and likelihood to identify the risk score shown in the risk matrix. The risk acceptability table over page, often called a heat map, uses colour to indicate the acceptability, or otherwise, of the assessed risk. At this point risk management becomes the evaluation of:

- Can we live with the risk as it is?
- Can we do anything better or do anything else?
- Are we demonstrating due diligence?
- Have we acted reasonably in terms of our efforts and decisions to manage risk?
- Who needs to know?




### Risk Acceptability

Risk Rating	Accept	Elevation	Action
Low Risk	Yes	HM Group	Risk and associated controls must be monitored and maintained No further risk reduction required unless the cost of risk control are far outweighed by benefits achieved Further control(s) may be required to meet changing regulatory or industry standards
Medium Risk	Yes	Harbour Master	Risk and associated controls must be monitored and maintained Further actions to be considered during risk review to reduce risk so far as is reasonably practicable (SFAIRP) - risk tolerable only if ALARP If further controls are available, reasonable and practicable, they should be implemented Benefit/cost type decision required to demonstrate sacrifice is not grossly disproportionate to the benefit
High Risk	No	MDC Chief Executive	A high level of risk should only be tolerated if; Controls have been implemented to a standard that reflects due diligence. The level of risk is understood by those who are exposed to the consequences of the incident to which the risk relates. Existing controls are monitored and maintained.
Very High Risk	No	Council	A very high level of risk should only be tolerated if; Controls have been implemented to a standard that reflects due diligence. The level of risk is understood by those who are exposed to the consequences of the incident to which the risk relates. Existing controls are monitored and maintained. There is no reasonably way to further reduce or eliminate the risk

## Hierarchy of Risk Controls

When assessing which available controls should be used, good practice requires that the hierarchy of controls be considered. The hierarchy of risk controls, in order of preference are:

### Hierarchy of Risk Controls

	Control	Explanation
	Elimination	Avoiding the sources of harm e.g. removing a trip hazard or getting faulty equipment repaired
	Substitution	Using a less hazardous thing, substance or work practice, e.g. using non-toxic glue instead of toxic glue
	Isolation	Preventing contact with or exposure to the risk. Separating people from the hazard/preventing people being exposed to the risk, e.g. putting screens around an area where welding is being performed
	Engineering	Using physical control measures, e.g. fitting screens to a grinder or extraction fans above welding area
	Administration	Using safe systems of work, processes or procedures designed to minimise risk, e.g. painting walkways and hazards so that pedestrians know where to walk and which areas to avoid
	PPE	Using safety equipment to protect against harm. PPE acts by reducing exposure if an incident occurs, e.g. Grade 5 ear protection in workshop

It should be noted that in the operational maritime risk register the level of risk attributed to any MCE does not tend to change with the addition of controls. This is because the risk criteria established for assessing consequence and likelihood are intentionally designed to be sufficiently coarse so as to prevent risks from being 'massaged' into a more agreeable category. To put it another way, the operational maritime risk assessment recognizes that to invent the ship is to invent the shipwreck and as yet, unsinkable ships have

not been built. This means that the MCE as relates to ships is always very high risk. This motivates and encourages a state of continuous unease and therefore vigilance in the face of ever present risk.

## Responsibility

Often responsibility for risk control will be shared across multiple stakeholders. Generally, the stakeholder with the primary duty for risk control will be the one whose activities give rise to the risk. The following stakeholder groups have been identified:

- Marlborough District Council
- Port Marlborough
- Ferry Operators
- Recreational Harbour Users
- Aquaculture
- Community
- Iwi
- Commercial vessels (excluding ships)
- Government and support agencies.

Each of these stakeholders is primarily responsible for managing their own maritime risk both in terms of the risk they create for other harbour users and the risks to which they are exposed. For example, Port Marlborough encourages and promotes shipping to the region and provides services for ships. As such, they have primary responsibility for provision of safe services such as pilotage and towage as pertain to ships. The role of the Harbourmaster is not to manage these risks but rather, to ensure these risks are being properly managed.

However, there is overlap in responsibilities which makes matters more complex. For example the Harbourmaster has responsibility for land and sea based aids to navigation which are critical to safe shipping. Likewise the Harbourmaster must seek to ensure that other harbour users are not operating in a manner that may jeopardise the safe transit of ships to and from the port.

The Maritime Safety Management System, Harbour Safety Plan and operational risk register attempt to clarify this point further by defining the roles and responsibilities of key stakeholders.

## Prioritised Risks

The Harbourmaster has established a systematic approach to understanding Marlborough’s maritime safety risks, with a particular focus on critical risks, so as to ensure the appropriate assignment of responsibility and allocation of resources.

## Prioritising Controls

Efficient risk management requires the release of resources for implementing controls. This often referred to as selecting low hanging fruit. The table below provides a simple tool to aid priority setting:

### *Prioritising Controls*

<ul style="list-style-type: none"> <li>• High Impact &amp; Low Cost</li> <li>• Implement Immediately</li> </ul>	<ul style="list-style-type: none"> <li>• High Impact &amp; High Cost</li> <li>• Implement If Reasonable</li> </ul>
<ul style="list-style-type: none"> <li>• Low Impact &amp; Low Cost</li> <li>• Implement as part of continuous improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Low Impact &amp; High Cost</li> <li>• Do Not Implement</li> </ul>

## Risk Register

The Harbourmaster shall administer the maintenance of the operational maritime risk register. Records of risk assessment activities should be maintained commensurate with the magnitude of the risk. The maintenance of risk assessment records assists traceability.

## Continuous Improvement

At least annually the Harbourmaster shall convene key stakeholders to review Marlborough Harbour’s overall risk profile to detect and respond to changes that may affect Harbour risks. One of the key functions of risk management is to help management prioritise their top ranked risks so that adequate resources can be allocated to aid risk reduction through planning, budgeting and capital processes. The risk review should consider:

- Changes to the registered risks
- New or emerging risks
- Risk reduction plans targeting top ranked risks and their progress /outcome
- Prompt and effective implementation of risk controls by assigned stakeholders
- Performance of the risk management system and any recommended improvement

## Auditing of Risk Controls

This involves formally auditing the risk controls to confirm they are in place and effective. Auditing of controls is required for all critical risks. These audits provide proactive information on the effectiveness of controls and create the opportunity to take preventive action. The use of risk specific audit checklists is a good practice to assure the important aspects are audited.

The results of auditing controls should be used as part of the risk review process. This provides crucial input on the effectiveness of controls and should be used to determine if any further risk control or other action is required.

## Consultation

Consultation is an important aspect of risk management and should include any stakeholder potentially impacted by another stakeholder's activity. The results of the risk management process shall be communicated to all affected parties. It is important that personnel exposed to risks have the appropriate information on risks and risk controls communicated to them and to keep records on who received communication and when. The Harbour Safety Management System provides an overview of how this is achieved.

## Coordination

The Harbourmaster is the Administrator of maritime risk management in Marlborough. Accordingly, he should be included in all risk related communications so as to be able to maintain an overview.

# Glossary

Definition	Meaning
<b>Access</b>	Safe means of access and egress, to be suitably constructed, kept free from obstruction and to be well maintained. Concept can be applied to access to/from ship or structure or safe access/egress to/from a navigable area within Marlborough
<b>Aid to Navigation</b>	A device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic. This is to differentiate their provision from the equipment carried on vessels for navigational purposes, which are referred to as navigational aids [MNZ Guidelines for Providing Aids to Navigation in New Zealand]
<b>Allision</b>	The running of one vessel into a fixed object, as distinguished from a collision, i.e., the running of two vessels against each other
<b>Awareness</b>	Workers shall be made aware of: <ul style="list-style-type: none"> <li>a. the OH&amp;S policy and OH&amp;S objectives;</li> <li>b. their contribution to the effectiveness of the OH&amp;S management system, including the benefits of improved OH&amp;S performance;</li> <li>c. the implications and potential consequences of not conforming to the OH&amp;S management system requirements;</li> <li>d. incidents and the outcomes of investigations that are relevant to them;</li> <li>e. hazards, OH&amp;S risks and actions determined that are relevant to them;</li> <li>f. the ability to remove themselves from work situations that they consider present an imminent and serious danger to their life or health, as well as the arrangements for protecting them from undue consequences for doing so [ISO45001:2018]</li> </ul>
<b>As low as reasonably practicable [ALARP]</b>	Concept used to help determine whether the risk level associated with a particular safety issue is acceptable. Generally, refers to a range of risk levels between intolerable and broadly acceptable, where there is some onus on the relevant organisations to demonstrate that they have addressed the safety issue as much as is reasonably practical to do in the circumstances [TAIC]
<b>Bylaw</b>	Council has introduced navigation safety bylaws to regulate vessel traffic in the region and ensure navigation safety in the Marlborough Harbour [MDC Harbour SMS]
<b>Change Management</b>	Systematic assessment and implementation of change to operations, processes, personnel, plant and equipment, products and services, premises etc [ICAM]
<b>Collision</b>	The act of ships or vessels striking together. In its strict sense, collision means the impact of two vessels both moving, and is distinguished from allision, which designates the striking of a moving vessel against one that is stationary [Black's Law Dictionary]
<b>Communication</b>	Transmitting information necessary for the safe and effective functioning of the organisation to the appropriate recipients in a clear, unambiguous what intelligible form [ICAM]
<b>Competence</b>	A cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation. Competence extends beyond the completion of statutory training i.e. an STCW certificate of competence is not in itself evidence of competence
<b>Conflicting Activity</b>	Potential clash of activities which could bring about and an undesired event or set of circumstances e.g. safety, environment, damage to assets, schedule, commercial, financial etc [IMCA M203 - Guidance on Simultaneous Operations]
<b>Consequence</b>	Outcome of an event affecting objectives. A consequence can be certain or uncertain and can have positive or negative direct or indirect effects on objectives [ISO31000:2018]
<b>Contractor Management</b>	Evaluation, selection, control and monitoring of contractor activities including personnel, equipment and materials [ICAM]
<b>Controls</b>	The measures put in place by an organisation to facilitate and assure safe performance of the operational components of the system—that is, operational personnel and equipment. Risk controls can be viewed as the outputs of the organisation's safety management system. Includes preventive and recovery risk controls. Sometimes known as defence, barrier or safeguard [TAIC]
<b>Critical Equipment</b>	Equipment or systems whose failure may lead to a potential hazardous situation, thereby causing injury to personnel, loss of life or damage to marine environment or property
<b>Critical Risks</b>	Critical risks are those with catastrophic consequences and are typically low probability
<b>Emergency Preparedness</b>	Process(es) needed to prepare for and respond to potential emergency situations [ISO45001:2018]
<b>Enforcement</b>	A successful and cost effective compliance strategy will draw on a range of options for responding to non-compliance. Responses can range from encouraging and assisting an individual or business to comply where the risk presented is minor, to revoking an operating licence and bringing criminal or civil court action in cases of serious risk and deliberate non-compliance [MDC Enforcement Policy]

Definition	Meaning
<b>Equipment Failure</b>	Equipment, a control system or an individual protection device which in the event of a single point failure may: Result in a hazardous situation which could lead to an accident, Or Directly cause an accident that results in harm to people or the environment [OCIMF - Safety Critical Equipment and Spare Parts Guidance]
<b>Error</b>	An action or decision involving deviation from an accepted standard, and which leads to an undesired outcome. They can be unintentional acts, or intentional acts with unintended outcome [ICAM]
<b>Fire/Explosion</b>	Fire can occur when flammable material, oxygen and sufficient ignition energy are available. Explosion depends on an atmosphere of a mixture of flammable material with oxygen. The best approach to prevent fires and explosions is to substitute or minimise the use of flammable material. [Wikipedia]
<b>Fitness for Work</b>	Fit for work means that an individual is physically and mentally able to perform assigned tasks competently and in a manner which does not compromise the safety or health of themselves or others [WorkSafe]
<b>Foundering</b>	Instability, caused by the centre of mass of the ship rising above the metacenter resulting in the ship tipping on its side or capsizing. [Wikipedia]
<b>Grounding</b>	Ship grounding is the impact of a ship on seabed or waterway side. In accidental cases, it is commonly referred to as "running aground." [Wikipedia]
<b>Hazard</b>	Something with the potential for harm
<b>Harbour Information</b>	Essential and timely information to assist the on-board decision-making process, which may include but is not limited to: <ul style="list-style-type: none"> <li>• The position, identity, intention and destination of vessels;</li> <li>• Amendments and changes in promulgated information concerning the VTS area such as boundaries, procedures, radio frequencies, reporting points;</li> <li>• The mandatory reporting of vessel traffic movements;</li> <li>• Meteorological and hydrological conditions notices to mariners, status of aids to navigation;</li> <li>• Manoeuvrability limitations of vessels in the VTS area that may impose restrictions on the navigation of other vessels, or any other potential hindrances: or</li> <li>• Any information concerning the safe navigation of the vessel. [IALA VTS Manual Ed.6]</li> </ul>
<b>Harbour Monitoring System</b>	The technical, legal and institutional setup facilitating systematic monitoring of vessel movements and their physical and information tracking, improvement of safety of navigation and life protection in rescue operations, risk reduction of the ship accidents and reduction of all types of dangerous situations, improvement of search and rescue service and reduction of the sea pollution risks and coordination of the cleaning action in case of accidents [EU Transport Research and Innovation Monitoring and Information System]
<b>Harbour Safety Management Systems</b>	MDC's Safety Management System used to promote navigational safety in the Marlborough District
<b>Health and Safety</b>	Related to preventing accident or injury in workplaces or public environments [WorkSafe]
<b>Incident</b>	An occurrence, other than an accident, associated with the operation of a transport vehicle which affects or could affect the safety of operation.
<b>Individual/ Group Actions</b>	Are observable behaviour performed by operational personnel. The term is generally used to refer to actions that increase safety risk, unless otherwise noted.
<b>Isolation</b>	Preventing contact with or exposure to the risk. Separating people from the hazard/preventing people being exposed to the risk,

Definition	Meaning
<b>Leadership</b>	<p>Top management shall demonstrate leadership and commitment with respect to the OH&amp;S management system by:</p> <ol style="list-style-type: none"> <li>taking overall responsibility and accountability for the prevention of work-related injury and ill health as well as the provision of safe and healthy workplaces and activities;</li> <li>ensuring that the OH&amp;S policy and related OH&amp;S objectives are established and are compatible with the strategic direction of the organization;</li> <li>ensuring the integration of the OH&amp;S management system requirements into the organization's business processes;</li> <li>ensuring that the resources needed to establish, implement, maintain and improve the OH&amp;S management system are available;</li> <li>communicating the importance of effective OH&amp;S management and of conforming to the OH&amp;S management system requirements;</li> <li>ensuring that the OH&amp;S management system achieves its intended outcome(s);</li> <li>directing and supporting persons to contribute to the effectiveness of the OH&amp;S management system;</li> <li>ensuring and promoting continual improvement;</li> <li>supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility;</li> <li>developing, leading and promoting a culture in the organization that supports the intended outcomes of the OH&amp;S management system;</li> <li>protecting workers from reprisals when reporting incidents, hazards, risks and opportunities;</li> <li>ensuring the organization establishes and implements a process(es) for consultation and participation of workers</li> <li>supporting the establishment and functioning of health and safety committees [ISO45001:2018]</li> </ol>
<b>Likelihood</b>	General description of probability or frequency, more so in qualitative terms rather than in mathematical or percentage terms.
<b>Man Overboard</b>	Where a person has fallen from a boat or ship into the water and is in need of rescue.
<b>Memorandum of Understanding [MOU]</b>	Formal agreements often used to document the division of responsibilities between the Council, port operators, the Harbourmaster, marine service providers and other relevant organisations [NZ Port and Harbour Marine Safety Code]
<b>Mental Impairment</b>	Abnormal state of mind (whether of a continuous or an intermittent nature), characterised by delusions, or by disorders of mood or perception or volition or cognition, of such a degree that it: (a) poses a serious danger to the health or safety of that person or of others; or (b) seriously diminishes the capacity of that person to take care of himself or herself [WorkSafe]
<b>Miscommunication</b>	Failure to communicate adequately. [Dictionary]
<b>Miscalculation of Risk</b>	Failure to assign an appropriate level of risk to a identified hazard [paraphrasing WorkSafe's definition of HSNO hazard rating] Underestimation of likelihood of something going wrong and the severity of the consequences [ICAM]
<b>Mooring Failure</b>	Failure of ship's mooring
<b>Natural Hazard</b>	A natural phenomenon that might have a negative effect on humans or the environment.
<b>Operator Error</b>	Failure to operate equipment or system as intended
<b>Operator Safety Management Systems</b>	Operator's Safety Management System used to manage risk appropriate to their scope of operations
<b>Personal Protective Equipment (PPE)</b>	Any item of equipment used to protect a person from hazards, for example, safety helmet, safety goggles, safety belt and line. [WorkSafe]
<b>Personnel (Competent)</b>	Any person who has: (a) the relevant knowledge, experience, and skill to carry out the task required; and (b) either (i) a relevant qualification evidencing the person's possession of that knowledge, experience, and skill; or (ii) if the person is an employee, a certificate issued by the person's employer evidencing the person's possession of that knowledge, experience, and skill. [WorkSafe]
<b>Planning</b>	The process of making plans for something. [Dictionary]
<b>Pollution</b>	Discharge including any release, disposal, spilling, leaking, pumping, emitting, or emptying [MTA section 225]
<b>Practicability</b>	Extent to which it is reasonable for a particular organisation to address (or have addressed) a particular safety issue. Involves considering the level of risk, the state of knowledge about the safety issue and the ways it can be addressed, the availability and suitability of ways to address the safety issue, and the cost of addressing the safety issue. [TAIC]
<b>Reason model</b>	Emphasises that unsafe acts have a key role to play in the development of accidents. However, the origins of unsafe acts are (usually) in management systems, not within the individuals who made the unsafe acts—that is, the model emphasises a 'system' approach to improving safety rather than an approach focusing on the individuals who make unsafe acts. [TAIC]
<b>Reserved Area</b>	Any area defined under the Marlborough Navigation Safety Bylaws Part 3.9 and further defined by words and maps, if any, in schedule 4 of that Bylaw [MDC Navigation Safety Bylaws 2009]

Definition	Meaning
<b>Resources</b>	<p>Top management and oversight bodies, where applicable, should ensure allocation of appropriate resources for risk management, which can include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• people, skills, experience and competence;</li> <li>• the organization's processes, methods and tools to be used for managing risk;</li> <li>• documented processes and procedures;</li> <li>• information and knowledge management systems;</li> <li>• professional development and training needs [ISO31000:2018]</li> </ul>
<b>Risk</b>	Effect of uncertainty on objectives. Risk is usually expressed in terms of risk sources potential events, their consequences and likelihood [ISO31000:2018]
<b>Risk Analysis</b>	Involves a detailed consideration of uncertainties, risk sources, consequences, likelihood, events, scenarios, controls and their effectiveness. purpose of the analysis, the availability and reliability of information, and the resources available. Analysis techniques can be qualitative, quantitative or a combination [ISO31000:2018]
<b>Risk Assessment</b>	The overall process of risk identification, risk analysis and risk evaluation.
<b>Risk Awareness</b>	Appropriate and timely involvement of stakeholders enables their knowledge, views and perceptions to be considered. This results in improved awareness and informed risk management. This enables organizations to explicitly address uncertainty in decision-making, while also ensuring that any new or subsequent uncertainty can be taken into account as it arises [ISO31000:2018]
<b>Risk Evaluation</b>	Risk evaluation involves comparing the results of the risk analysis with the established risk criteria to determine where additional action is required. Decisions should take account of the wider context and the actual and perceived consequences to external and internal stakeholders [ISO31000:2018]
<b>Risk Management</b>	Coordinated activities to direct and control an organization with regard to risk [ISO31000:2018]
<b>Risk Treatment</b>	<p>The purpose of risk treatment is to select and implement options for addressing risk. Risk treatment involves an iterative process of:</p> <ul style="list-style-type: none"> <li>• formulating and selecting risk treatment options;</li> <li>• planning and implementing risk treatment;</li> <li>• assessing the effectiveness of that treatment;</li> <li>• deciding whether the remaining risk is acceptable;</li> <li>• if not acceptable, taking further treatment [ISO31000:2018]</li> </ul>
<b>Safe Access</b>	For details of factors to be taken into account see Report on Environmental Factors Affecting Safe Access & Operations within New Zealand Ports and Harbours
<b>Safety Culture</b>	Safety culture is the collection of the beliefs, perceptions and values that employees share in relation to risks within an organization, such as a workplace or community. [Wikipedia]
<b>Safety System</b>	<p>A structured and documented system enabling harbour, port and ship operators to implement their health, safety and pollution prevention policies. This may include:</p> <ul style="list-style-type: none"> <li>• the design of work in which risks have been controlled</li> <li>• the process, pace and flow of the work</li> <li>• work practices used</li> <li>• the design and use of plant and equipment, and</li> <li>• the effect of environmental factors</li> </ul>
<b>Seismic Activity and Tsunami</b>	The shaking of the surface of the Earth, resulting from the sudden release of energy in the Earth's lithosphere that creates seismic waves. The long, high sea wave caused by an earthquake or other disturbance. [Wikipedia]
<b>Signage</b>	Signs advising of hazards. These are subdivided as follows: Danger signs. Signs warning of a particular hazard or hazardous condition that is likely to be life-threatening. Warning signs. Signs warning of a hazard or hazardous condition that is not likely to be life-threatening. [WorkSafe]
<b>Stakeholder</b>	Person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity [ISO31000:2018]
<b>Standard Operating Process [SOP]</b>	Step-by-step instructions compiled by an organization to help workers carry out complex routine operations. [Wikipedia]
<b>Task Complexity</b>	The degree of complicated actions needed to complete a task. [Psychology Dictionary]
<b>Time Pressure</b>	Performance degradation in the performance of complex tasks due to the shortage of cognitive resources thus leading to adoption of simple strategies and increased performance errors. [ICAM]
<b>Tool Availability</b>	Correct tools are immediately available for use by the competent person
<b>Training</b>	Action of teaching a person a particular skill or type of behaviour. [Wikipedia]
<b>Unsafe vessel</b>	<p>Taking into account the nature of the service for which the vessel is intended, the vessel is unfit to go to sea without serious danger to human life. A vessel may be unsafe due to:</p> <ul style="list-style-type: none"> <li>• the ship's condition, or unsuitability for its purpose, or its machinery or equipment</li> <li>• under manning</li> <li>• overloading or unsafe or improper loading</li> <li>• any other matter relevant to the safety of the ship [UK Merchant Shipping Act 1995]</li> </ul>

Definition	Meaning
<b>Violation</b>	A deliberate deviation from a rule or procedure, essentially breaking the rules [ICAM]
<b>Work load</b>	The amount of work to be done by someone or something. [Dictionary]
<b>Work Conditions</b>	The way in which work is structured, supervised and processed. It deals with the institutional features of work such as the nature of the organisational chart, who is the boss, power, authority, responsibilities, how work gets done, the nature of tasks including such features as workload and content. It is the objective nature of the work process. [WorkSafe]
<b>Worst Credible Scenario</b>	The worst occurrence, in terms of the severity of its consequences, that could occur as a result of a safety issue, after consideration has been made of the risk controls and management processes in place to minimise risk. Concept used in risk analysis.
<b>Worst Possible Scenario</b>	The worst occurrence, in terms of the severity of its consequences that could occur as a result of a safety issue. No consideration is made regarding the risk controls or management processes in place to reduce the consequences or likelihood of such a scenario.

## Alignment with the MDC Risk Assessment Policy

An MDC Risk Assessment Policy is in place to ensure consistency in comparing risks across the organisation and year to year movements within one operational area. This approach has been used to assess harbour generic or core operational risk as recorded in the Harbours operational risk register. However, this risk management standard was created to better serve the purpose of managing maritime risk.

Both the MDC RISK Assessment Policy and this Risk Management Standard align with the principles and processes outlined in ISO 31000/2018. As such, it is considered that this standard complies with the MDC policy.

A copy of the Harbours operational risk assessment is available in CM. Record number 2012762.