

# CREW RESOURCE MANAGEMENT 2

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**Constructive feedback and suggestions for improvements to the SAR Training Matrix is appreciated. Please email feedback / suggestions to [sartrainingfeedback@coastguard.co.nz](mailto:sartrainingfeedback@coastguard.co.nz) providing as much detail as possible. Thank you.**

## Overview

Accidents at sea occur due to technical, environmental and human factors. Human error is widely accepted as the most common contributing factor in accidents at sea.

Most accidents are caused by:

- Becoming consumed by minor technical problems.
- Failure to set priorities.
- Failure to properly communicate plans.
- Inadequate monitoring.
- Fatigue
- Lack of or poor training
- Failure to use all available data.
- Failure to identify and act upon deviation from SOPs
- Failure to appropriately delegate tasks.

Crew Resource Management (CRM) is an approach to improving safety that realises that technical skills alone are not enough to manage a vessel on demanding and complex rescue missions.

### *Context*

The development of this course resulted from the key recommendations of the Transport Accident Investigation Commission (TAIC) Marine Occurrence Report (2011). This commission investigated four accidents involving Coastguard New Zealand (CNZ) vessels involved in call outs between 2008 and 2010. The six key recommendations from the TAIC report (2011) were given to CNZ and on 13<sup>th</sup> May, 2011 they responded to each of the recommendations (see the full responses in the Appendix 1).

This course has been developed to specifically address;

- **Recommendation 1**

The development of decision making skills of those in charge using maximum information to make prudent decisions. A person independent of the CRV crew should always be involved in the decision making process.

- **Recommendation 3**

Standard operating procedures for pre-departure planning including a risk assessment process.

- **Recommendation 4**

Develop a culture that increases individual's appreciation of the personal and team responsibility. This will improve the cohesiveness of the team to maintain situational awareness, monitor the plan, anticipate dangerous situations, acquire timely information and avoid pre-occupation with minor problems.

CRM emphasises the use of all resources available to the crew of a vessel, including equipment and people. Because technical skills are covered in other parts of the Coastguard Rescue Vessel (CRV) training, CRM training focuses on those skills necessary for effective crew performance and includes a wide range of knowledge, skills and attitudes, including communications, situational awareness, problem solving, decision making and teamwork.

## 1. Principles of CRM

CRM is based on the principles that:

- It is about people (interpersonal (soft) skills).
  - Developing interpersonal skills requires active participation.
  - crew Members' attitudes and behaviours are important.
  - All crew Members are responsible for the performance of the team
  - Good teams require effective leaders
  - Effective communications are essential.
- It is about technical (hard) skills
  - Effective standard procedures are essential (SOPs and checklists).
  - Equipment and information management

CRM is about leadership.

## 2. Situational Awareness

Situational awareness involves being aware of the elements in the environment at a certain time and place, understanding what they mean, and having an ability to project how the environment will be in the near future.

On a coastguard mission, the main components of situational awareness will include:

- Environmental awareness – that is, awareness of other craft in the area, weather, sea conditions, communications between the boat and shore. It is important to remember that this is constantly changing.
- Spatial orientation – that is, awareness of your geographical position.
- System awareness – that is, awareness of the systems on the boat and their status.
- Time horizon – that is, awareness of time management.
- Crew awareness – are the crew in good condition and focused on the task at hand?

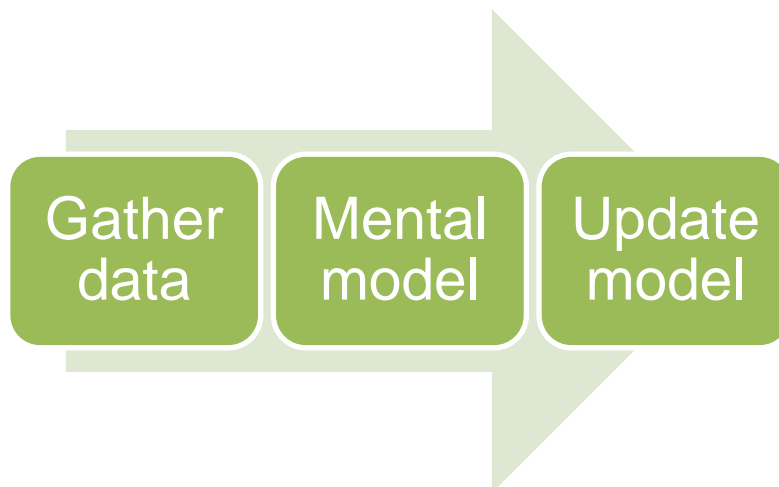
The absence of situational awareness causes accidents. A loss of situational awareness can lead to inadequate decision making and inappropriate actions.

## 2.1 Gaining and Maintaining Situational Awareness

A state of high situational awareness is characterised by the following (p61; Parott, 2011);

- Accurately discerning which developments have the potential to impact you
- Detecting changes to the present situation in a timely fashion
- Comprehending the significance of those changes for you
- Formulating a correct course of action for maintain control of the situation

This can be represented in a diagram that simplifies the process into three stages;



### Stage 1 –Gathering Data (Perception)

To build a mental picture of what the surrounding is like it is important to gather data about the situation at the current time and then compare it with your experience and knowledge. This is an active process that requires knowing what to look for, when to look for it and why.

## Stage 2 – Mental Model (Understanding)

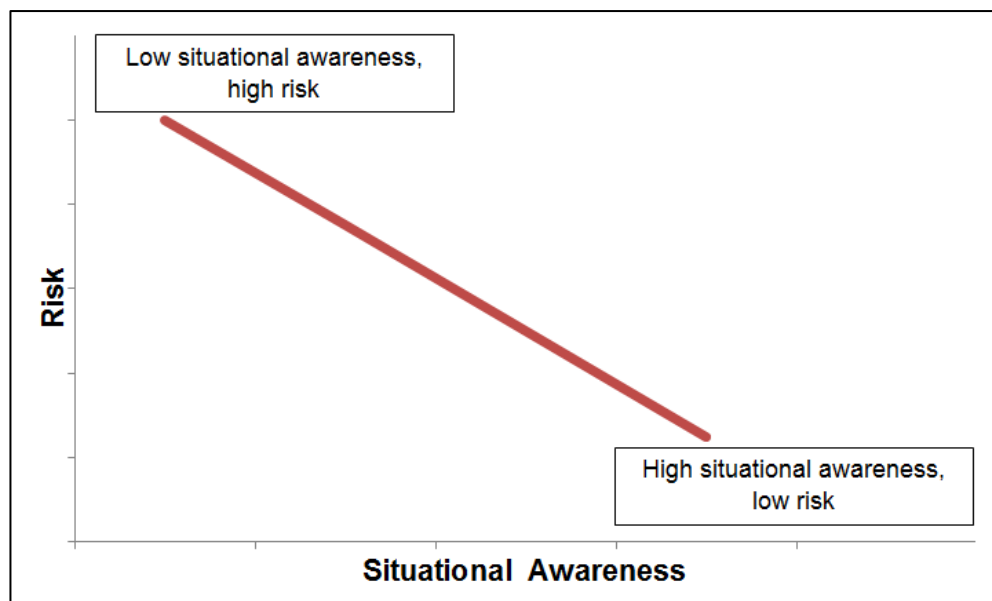
A mental model of the situation, at any set time, is the result of the combination of perceptions (data gathered) from the current situation with knowledge and experience from previous experiences (memory). If they are similar, then you have an accurate mental model of the situation at that particular time. However, because conditions change, this model, or picture, of the situation you are in has to be kept updated with the most recent information from the surroundings. Therefore it is important to be continually gathering data from your surroundings.

## Stage 3 – Update Model (Thinking Ahead)

Having a mental model provides you with the capacity to think ahead and identify developments that may have the potential to effect the CRV and crew. Updating the mental model allows you to understand how the effect of changes in the conditions may impact you and provides the opportunity for you to make timely decisions.

For example, your boat can safely function in the current environment. However your understanding of the data, such as wind speed, growing swell size, available light, Crew fatigue and your own knowledge and experience of this situation allows you to think ahead and decide that the conditions will get worse and your boat will no longer be able to function in the environment in an hour's time. You are able to make decisions accordingly.

Situational awareness is inversely proportional to risk.



## 3. Leadership Styles<sup>1</sup>

How you interact with crew can affect the performance of the team. There are many types of leadership styles that can be used to enable teams to work effectively. The type of leadership style used may depend on your personality as well as the interactions and personalities in your team. Leadership is about people and an effective leader will learn how to lead and adapt their leadership style to the situation – this may be the phase of a mission or a change in crew.

What makes a good leader? Some key attributes include; self awareness, self direction, vision, ability to motivate and social awareness. Effective leaders are those who are able to use these skills and apply an understanding of different ways to lead crew according to the situation. There are a number of recognised leadership styles.

### 3.1 Autocratic Leadership

Autocratic leadership describes leaders who:

- have a lot of power over their people.
- team members have little opportunity to make suggestions, even if these would be in the team's or the organisation's best interest.

This leadership style can be effective when:

- performing routine and unskilled jobs
- decisions must be made quickly and without dissent
- an immediate crisis or emergency situation exists

The benefit of autocratic leadership is that it's incredibly efficient. Decisions are made quickly, and work gets done efficiently. The downside is that most people resent being treated this way.

### 3.2 Bureaucratic Leadership

Bureaucratic Leadership describes leaders who:

- work "by the book."
- follow rules rigorously

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<sup>1</sup> The summary of leadership styles were adapted from "Managers and Leaders" <http://bit.ly/1g2fMEM>

- ensure that their people follow procedures precisely

This leadership style can be effective when:

- work involves serious safety risks
- people do routine tasks
- standard operating procedures and methods exist

The benefit is that leadership is consistent and people know where they stand. The downside of this leadership style is that it's ineffective in teams and organisations that rely on flexibility, creativity, or innovation.

### **3.3 Participative Leadership**

Participative leadership describes leaders who:

- make final decisions but include team members in the decision-making process.
- encourage creativity
- engage team members in projects and decisions

This leadership style can be effective when:

- people's skills need developing
- quality is more important than efficiency or productivity
- working as a team is essential

The benefits are that people tend to have high job satisfaction and are productive because they're more involved in decisions. The downside of democratic leadership is some people might not have the knowledge or expertise to provide high quality input and it is not ideal in situations where speed or efficiency is essential. For instance, during a crisis, a team can waste valuable time gathering people's input.

### **3.4 People-Oriented Leadership**

People-Oriented leadership describes leaders who:

- are focused on organising, supporting, and developing the people on their teams.
- treat everyone on the team equally.
- Are friendly and approachable

This leadership style can be effective when:

- Teamwork is essential for success
- The leader makes themselves available whenever team members need help or advice
- The leader pays attention to the welfare of everyone in the group

The benefit of this leadership style is that people-oriented leaders create teams that everyone wants to be part of. People are often more productive and willing to take risks, because they know that the leader will provide support if they need it. The downside is that some leaders can take this approach too far; they may put the development of their team above tasks.

### **3.5 Transformational Leadership**

Transformational leadership describes leaders who:

- are inspiring
- expect the best from everyone on their team as well as themselves
- look after initiatives that add new value

This leadership style can be effective when:

- high productivity and engagement is required
- the leader is enthusiastic
- the leader is supported by "detail people."

The benefits of this leadership style is that it leads to high productivity and engagement in the team. The downside of transformational leadership is that while the leader's enthusiasm is passed onto the team, it is not effective unless there are others to take care of the detail.

### **3.6 Laissez-Faire Leadership**

Laissez-Faire leadership describes leaders who:

- allow their people to work on their own.
- give their teams freedom to do their work and set their own deadlines.
- provide support with resources and advice, if needed, but otherwise doesn't get involved.

This leadership style can be effective when:

- the leader monitors performance
- gives feedback to team members regularly.



- individual team members are experienced, skilled, self-starters.

The main benefit of laissez-faire leadership is that giving team members so much autonomy can lead to high job satisfaction and increased productivity. The downside is that it can be damaging if team members don't manage their time well or if they don't have the knowledge, skills, or motivation to do their work effectively.

### **3.7 Leadership Skills**

Your personal leadership style never really changes however, skilled leaders are able to adapt their style to individuals or groups depending on situation. There are a number of specific aspects of leadership that can influence the effective management of crew. These aspects are;

- Team development.
- Communication.
- Situational awareness.
- Risk assessment.
- Decision making.

## 4. Team Development

A leader can respond to the development of a team in various ways. A common model of team development has four stages.<sup>2</sup> These can be described as:

- Forming:** everyone is polite, does what they are told and listens to the boss.
- Storming:** as we get used to each other, conflicts and challenges emerge.
- Norming:** we develop ways of dealing with conflicts, get to know strengths and weaknesses and start to work together.
- Performing:** proactivity, active problem-solving and reduced dependence on the leader.

The table below shows each of the stages, their characteristics, and ways the leader can best respond to these stages.

Stage	Characteristics of stage	Leadership style to best manage the stage
<b>Forming</b>	<ul style="list-style-type: none"> <li>• Leader dependant</li> <li>• Reactive</li> <li>• Members do as they are told</li> <li>• Lack of structure and organisation</li> </ul>	<p><b>‘Tell’</b></p> <ul style="list-style-type: none"> <li>• Give clear, detailed instructions. <i>E.g. communication of safety issues or government regulations, and for decisions that don’t require Crew input.</i></li> </ul>
<b>Storming</b>	<ul style="list-style-type: none"> <li>• Conflicts begin to surface</li> <li>• Move to being more proactive</li> <li>• Challenges to authority and less dependence on leader</li> <li>• Roles and dynamics begin to emerge</li> </ul>	<p><b>‘Tell/Sell’</b></p> <ul style="list-style-type: none"> <li>• Make the decision and then get the team to agree by debating it.</li> <li>• Manage conflicts.</li> <li>• Maintain consistency and fairness; be prepared for dissent.</li> <li>• Ensure crew understands the reasoning behind decisions.</li> <li>• Coach crew.</li> <li>• Sell is a good style when you need people to agree, but there is no time, or it is inappropriate</li> </ul>

<sup>2</sup> From [http://en.wikipedia.org/wiki/Tuckman%27s\\_stages\\_of\\_group\\_development](http://en.wikipedia.org/wiki/Tuckman%27s_stages_of_group_development)

Stage	Characteristics of stage	Leadership style to best manage the stage
<b>Norming</b>	<ul style="list-style-type: none"> <li>• More stability and structure</li> <li>• Challenges and deviation tolerated if helpful</li> <li>• Group identity emerging</li> <li>• More cooperation</li> </ul>	<p><b>‘Delegate and monitor’</b></p> <ul style="list-style-type: none"> <li>• Keep an eye on the situation.</li> <li>• Gain team input on decisions while still maintaining control over the final result.</li> <li>• Make it clear that they are being consulted, not making the decision, but that their input will be taken into account.</li> <li>• Foster leadership in appropriate crew – provide more explanation.</li> </ul>
<b>Performing</b>	<ul style="list-style-type: none"> <li>• Active problem-solving</li> <li>• Open communication</li> <li>• Role clarity</li> <li>• High teamwork and cooperation</li> <li>• Innovation (doing things better in new ways)</li> </ul>	<p><b>‘Participate’</b></p> <ul style="list-style-type: none"> <li>• Practice turning decision making over to another crew or group.</li> <li>• Create opportunities for crew to demonstrate leadership and initiative.</li> <li>• At this stage the leader can afford to ‘step back’ and participate in the decision making process as an equal team member.</li> </ul>

Situational awareness is accurately discerning which developments are most important and detecting changes to the situation in real time, in order to understand the significance of those changes. This process will give the ability to choose a correct course of action to maintain control of the situation. Being aware of the crew, their actions and needs, is part of situational awareness. The ability to manage the crew using these skills can be described as situational

leadership. Situational leadership is about being adaptable as a leader. It is choosing the most appropriate style of leadership to use at the time.

## 5. Communication

### 5.1 Identifying Communication Styles

Understanding that there are different ways of communicating with people allows a leader to be more effective. Being an effective communicator with different crew requires a leader to be aware of the communication style of those crew. You need to adapt your communication style so it is meaningful to them. The personalities of crew vary as does their approach to tasks.

- People with a high **task orientation** will be concerned with getting the job done.
- People with a high **people orientation** will be concerned with process and relationships.
- **Extroverts** will be more likely to speak up/issue challenges and wish to discuss issues.
- **Introverts** will be less likely to speak up, and could require prompting or encouragement.

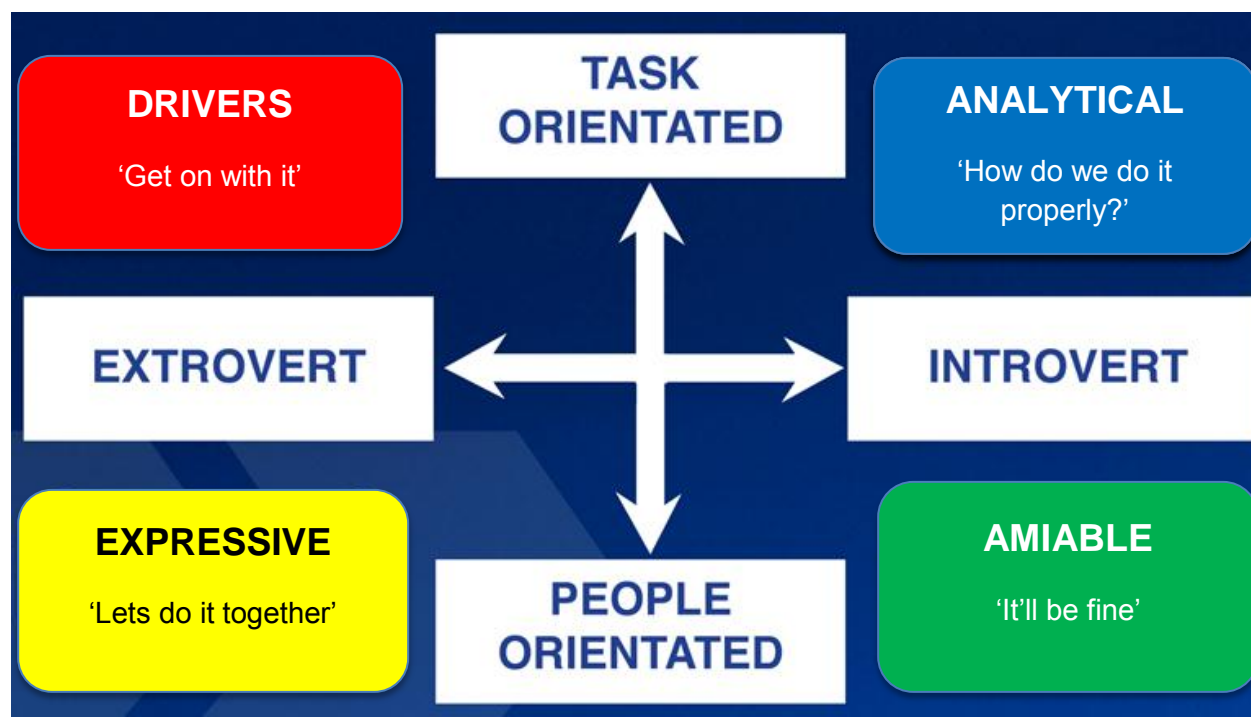
David Merrill<sup>3</sup> identified that combining task or people orientation and introversion or extroversion gives four approximate 'styles': amiable, analytical, drivers and expressive;

<b>AMIABLE</b> 'It'll be fine'	<ul style="list-style-type: none"> <li>• Be non-threatening.</li> <li>• Ask open questions.</li> <li>• Take time with them.</li> <li>• Pay attention.</li> </ul>
<b>ANALYTICAL</b> 'How do we do it properly?'	<ul style="list-style-type: none"> <li>• Provide explanation and information.</li> <li>• Show your reasoning.</li> <li>• Value their approach.</li> <li>• Be clear and consistent.</li> </ul>
<b>DRIVERS</b> 'Get on with it'	<ul style="list-style-type: none"> <li>• Tell the end result.</li> <li>• Avoid waffle.</li> <li>• Give brief, clear instructions.</li> <li>• Be specific and factual.</li> </ul>
	<ul style="list-style-type: none"> <li>• Show care and respect.</li> </ul>

<sup>3</sup> Adapted from David Merrill in *Social Styles*. Trigon System Consultants. Retrieved September 7 2011 from <http://www.softed.com/resources/Docs/SSW0.4.pdf>

<b>EXPRESSIVE</b> 'Let's do it together'	<ul style="list-style-type: none"> <li>• Talk about individual as well as team.</li> <li>• Incorporate 'big picture'.</li> <li>• Pay attention to them.</li> </ul>
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Merrill's communication styles and personality types can be summarised as;



## 5.2 Developing communication

Encouraging crew to build their communication skills and interpersonal understanding can be achieved by:

- Choosing off water activities that foster teamwork and build camaraderie.
- Encouraging feedback, challenges and requests for clarification by asking for them.
- Asking for crew perspective on events e.g. "How could we have done that better, Greg?"
- Improving situational and crew self-awareness..

### Closed Loop Communication

Closed loop communication is a good example of paraphrasing (repeating back) a message and obtaining agreement before proceeding

### Keep Talking

Crews who communicate more often perform better than crews who communicate less. The more communication there is on a vessel, the fewer the errors that occur. It is essential, therefore, that all crew are communicating throughout a mission. Encourage Crew to keep talking by using the following behaviours:

- Convey information clearly and in a timely manner. Use standard terminology.
- Express concerns and suggestions clearly.
- Acknowledge communications using closed loop practices.
- Ask for clarification when needed.
- Resolve conflicts.

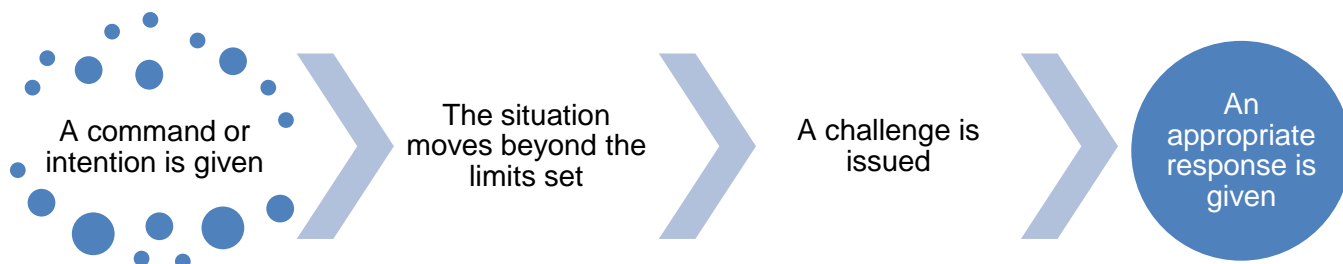
### 5.3 Challenge

Challenge provides a way for crew to clarify or question a particular action or decision based on their understanding of the situation. An effective team will have a leader who can establish a culture that allows and encourages challenge. Mistakes in judgment can happen at any time by anyone, therefore challenge provides an effective safety measure. Crew should develop skills that allow them to challenge judgements in an appropriate way. These skills include the ability to question, respond and convey information.

Crew may be hesitant to challenge or seek clarification because:

- They don't want to lose face if they are wrong (fear of being laughed at, or 'told off').
- They don't want anyone else to lose face if they are right (reluctant to point out others' mistakes).
- They assume that the skipper or senior crew will know better than them (fear that their interpretation of the situation is incorrect due to their lack of experience).

Establishing a process for challenge will give crew confidence that they can be heard without feeling that they are 'out of line'. One such process is:



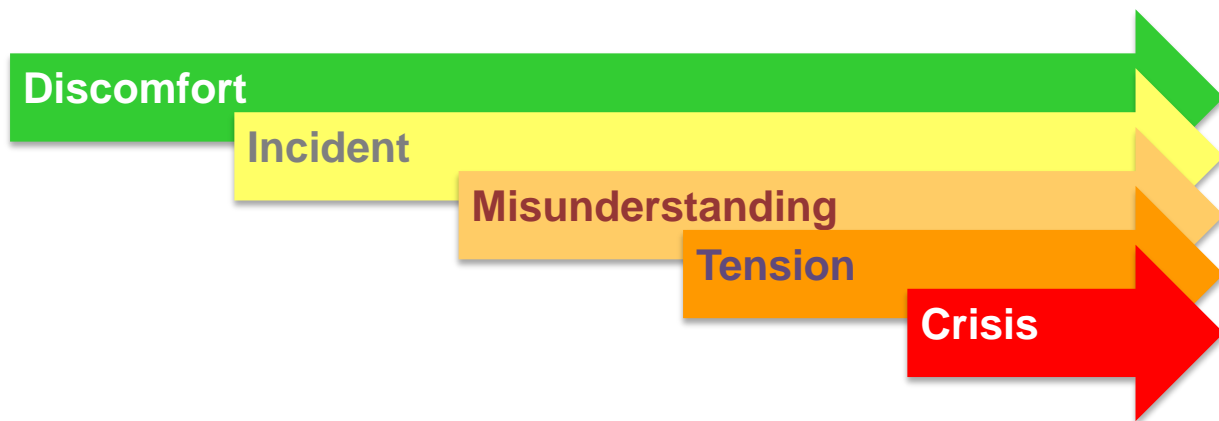
## Receiving Challenges

When dealing with a challenge;

- Always check the validity of the challenge
- Don't dismiss or laugh off a challenge
- Consider why a challenge was given, maybe it was the result of a breakdown in communication or lack of knowledge or training by the crew.

## 5.4 Conflict

Conflict can be positive or negative, depending on how it is dealt with. Understanding how conflict grows allows people to recognise its early signs and effectively deal with it before it becomes bigger than it needs to be. The following conflict clues show how a conflict situation can grow.



- Discomfort: a feeling that something is not right in a situation.
- Incident: something happens that leaves a person temporarily feeling upset or irritated.
- Misunderstanding: result from people making wrong assumptions. This could be due to a lack of clear communication about facts or motives.
- Tension: culmination of failed communication. Emotions run high and there are negative attitudes. Tension can distort your perception of the situation.
- Crisis: evidenced by extreme behaviour. People respond out of character as a result of being overwhelmed by their feelings.

By dealing with discomfort and minor incidents as they arise makes it less likely for them to develop into a more serious misunderstanding, tension or crisis.

Successful conflict resolution may pass through an 'expression' stage (where people 'get it off their chest') to a 'cooperation' stage (where people work together to find a resolution). Manage these factors carefully to avoid escalation which may compromise team goals and safety.

During the expression stage, using active listening skills, the best way to respond is to allow the person to have their say then repeat the key points back to them in order to clarify your understanding. Then explain your understanding of the situation.

If the expression stage is avoided, or crew become involved in a shouting match the conflict can escalate. The following steps can assist in dealing with a conflict situation;

1. Stay calm

- Avoid getting caught in an emotional response.
- Focus on de-escalating the situation.
- Watch your emotions and body language
- Restate the situation in non-emotional terms and check for agreement.

2. Clarify:

- Ask questions and clarify information to avoid misunderstandings.
- Check your understanding of their view.

3. Build understanding:

- Recognise that people have different ways of viewing things.
- Recognise that people express or communicate in different ways – what you heard may not be what they meant.

4. Identify the cause:

- Seek to uncover the root of the conflict, rather than reacting to the emotion.
- Perhaps a mistake or miscommunication has been covered up – seek to rectify without blame.

5. Focus on a resolution:

- Remove one or more crew, e.g. *“Greg, can you come over here for a sec?”*
- Change the scene or mode of communication, e.g. *“Let’s discuss this in the radio room”*.
- Show you are there to resolve the issue, e.g. *“Let’s work this out”*.

## 5.5 Having Difficult Conversations

A skipper or senior crew may encounter a situation where an issue of inefficient or unsafe behaviour needs to be raised. A key part of any leadership role is to be able to have these conversations. The following structure can provide a helpful platform to prepare conversation starters, and help to conduct a balanced, non-judgmental discussion of the issues.



## “Let’s talk”

<p><b>I’d like to discuss ...</b></p> <ul style="list-style-type: none"><li>• Make sure it is the right time/place to bring this up (within reason)</li><li>• Be very clear and take on one issue at a time</li><li>• Keep positive</li></ul>
<p><b>I noticed ...</b></p> <ul style="list-style-type: none"><li>• Be specific in what the action or behaviour is</li><li>• Own the observation and resist the urge to ‘back up’ your observation with hearsay</li></ul>
<p><b>This affects the team / Coastguard ...</b></p> <ul style="list-style-type: none"><li>• Describe what the effects of the behaviours are and why this matters</li><li>• Address the problem, not the person</li><li>• Connect to their values</li></ul>
<p><b>We need you to ...</b></p> <ul style="list-style-type: none"><li>• Describe what needs to happen – give examples</li></ul>
<p><b>Can we discuss this?</b></p> <ul style="list-style-type: none"><li>• Give them time to respond</li><li>• Listen, repeat back and clarify any points</li><li>• Agree on actions, support and timeframes</li></ul>

## 5.6 Briefing and Debriefing

Briefings and debriefings are important parts of any mission or training exercise. They ensure that critical information is shared by all crew and the mission plan and objectives are clear. They also ensure the crew reflect on the experiences to improve their practice.

It is important to make sure that all crew involved in a mission or training participate in the briefing and debriefing. All crew should know what they are doing prior to a task being undertaken. This may require holding back from an emergency situation for a few more minutes until the crew can participate in the briefing.

### **Briefing**

Missed information can mean missed opportunities, and at worst, missing people. Briefing provides critical information about the training exercise or mission. Briefings should;

- be delivered by the leader and clearly and concisely summarise the key points
- provide time for crew to raise any safety concerns, challenges or limitations which may interfere with the SAR or training plan.
- convey the minimum amount of instruction necessary for the mission or activity to be completed effectively.

### **GSMEACR Briefing Tool**

A suggested briefing method is set out below. This tool is to be used as a prompt for leaders to manage the briefing information received and the risk assessment that is conducted prior to launch and during the operation.

<b>Ground</b> Setting the scene. This is a 'big picture' orientation for the Crew (the 'where' element).
<b>Situation</b> Contains accurate information about what has happened, what the situation is now and why the team is involved.
<b>Mission</b> This is the overall objective.
<b>Execution</b> Provides detailed information about how the mission will be accomplished and includes the; who, what, how, when, and where of the task to be carried out by the team.

**Administration**

Information regarding logistics, i.e. resources available and record keeping

**Command, Control and Communications**

Who is in charge of what and how you are going to communicate with them.

**Risk Assessment**

Identification and discussion of all risks.

**Debriefing**

Debriefing is the time set aside for evaluation of the mission. This is when the crew has the opportunity to share their observations, queries, thoughts, challenges or requests for clarification. A good team is able to use this time effectively to discuss ways things can be done differently to make them more efficient and safe. It is an essential part of the training experience for all crew.

Essential elements of debriefing include:

- **Timeliness** – as soon after the incident or activity as possible.
- **No-blame environment** – all contribution is welcome.
- **Focus on improvement** – the goal is to learn and improve.
- **Respect** – individuals' viewpoints are respected.

**Debriefing Checklist**

A debriefing checklist to prompt for areas to be covered can be a useful tool. The following could be considered during debriefing:

- Duration of debrief.
- Who should conduct the debrief.
- The mission.
- Team performance and makeup.
- Tasks undertaken.
- Navigational information.
- Environmental conditions.
- Lessons learnt.
- Recommendations.

## 6. Loss of Situational Awareness

Effective leadership requires a constant state of situational awareness. A number of factors can influence the loss of situational awareness which can ultimately effect safety, task completion and leadership.

Previously, situational awareness was defined as being aware of the elements in the environment at a certain time and place, understanding what they mean, and having an ability to project how the environment will be in the near future. Three phases were identified. Gathering data preceeds the development of the mental model. Having a mental model provides you with the capacity to think and plan ahead. However, there are situations where loss of situational awareness may occur – at any of the three levels. These are identified below;

### Level 1 – Perception

- Data is missed because of;
  - Night blindness.
  - Passive, complacent behaviour.
  - High workload.
  - Distractions and interruptions.
  - Visual illusions.

### Level 2 – Understanding

- Use of an incorrect or incomplete mental model due to:
  - limited observations.
  - limited knowledge and experience.
- Confirmation bias - expecting to see a particular thing can result in believing what you expect to happen rather than what is actually happening

### Level 3 – Thinking Ahead

- Failing to see that a mental model needs to change.

The following clues indicate that situational awareness is becoming compromised:

- Plans and instructions are unclear.

- Fixating on one thing to the exclusion of all else.
- A situation is uncertain or misunderstood
- Information is miscommunicated or unclear
- Preoccupation with external issues
- Expected mental checkpoints are not reached.
- Communications are not effective.
- SOPs are not followed.
- Time feels short.
- You start to feel out of control

The following points can help with recovering situational awareness:

- Stop. Recalibrate your situational awareness
- Follow proven best practices and SOPs.
- Communicate and ask for help.
- Recover the big picture by going back to the last thing you were sure of, assessing the situation from a different perspective, expanding your focus or taking time to think.

## **7. Risk Management**

Every mission that the crew are involved with involves risk that needs to be assessed. Crew welfare and safety is paramount. It is important to minimise risk and make decisions that have been carefully weighed against all the risks present. Each Unit will have their own risk assessment tools, procedures as well as SOPs which should be used to complete risk assessment.

The Skipper has the absolute right, responsibility and authority to decline any assigned mission if it is considered that it involves an unacceptable level of risk. All crew have the absolute right to challenge any decision or action that is asked of them if they consider that it involves an unacceptable level of risk.

Each region or team will have a risk assessment procedure as well as SOPs which may differ from other regions. One example is the Risk Management Matrix.

Name of Marine SAR Co-ordinator / Duty Officer

Name of Skipper

Name and number of the Incident

Date / /

Time

Hrs

Hazard	Low Risk	Pts	Moderate Risk	PTS	High Risk	Pts	Total
<b>People (Suggested Values)</b>							
<b>Skipper / Crew Experience / Training</b>	Mostly Senior Op Crew	0	Mostly Op Crew > 50 hrs	10	Mostly Op Crew > 10 hrs	20	
<b>Skipper / Crew Currency (as per SSM)</b>	Most Crew in last month	0	Most Crew in last 6 months	10	Most Crew in last 12 months	20	
<b>Skipper / Crew Health / Rest</b>	Most good health and proper rest	0	Most fair health and/or some signs of fatigue	15	Most poor health and/or serious fatigue	No Go	
<b>Personal Protection equipment (Kit)</b>	Crew is well kitted out for the conditions	0	Crew will be stretched in these conditions with their current kit	20	Conditions exceed the kit the Crew have	No Go	
<b>Vessel (Suggested Values)</b>							
<b>Vessel Capability</b>	Within vessel and Crew capability	0	The conditions stretch the capability of the vessel and Crew	20	The conditions exceed vessel or Crew capability	No Go	
<b>Communications</b>	Good in all areas	0	Some blind spots expected	10	Poor comms	20	
<b>Task (Suggested Values)</b>							
<b>Whole of Mission (Survivability)</b>	Incident occurred under 1 hr	0	Incident occurred under 1 hr but less than 5 hrs	10	Incident occurred over 5 hrs	20	
<b>Search Complexity</b>	Simple tasks using known technology	0	Complex tasks using known technology	10	Complex tasks new technology	20	
<b>Environment (Suggested Values)</b>							
<b>Weather over Operational Period</b>	Good, calm weather	0	Not good weather and changeable	15	Very bad weather, bad forecast	NoGo	
<b>Areas for Refuge if Weather Turns Bad</b>	Good	0	Some	10	None	30	
<b>Night Operations</b>	Crew trained in Night Ops	0	Crew partially trained in Night Ops	10	Crew not trained in Night Ops	25	
<b>Visibility Night or Day</b>	Good	0	Fair using equipment on board	15	Bad even using equipment on board	No Go	
<b>Objective Hazards (Reefs, Rocks, etc.)</b>	No hazards in the area	0	Some hazards in the area	10	Many hazards in the area	25	
<b>Area Familiarity</b>	Crew familiar with the area	0	Some Crew familiar with the area	10	Crew not familiar with area	25	
<b>Tide Affect</b>	No issues	0	Some concerns	15	Concerns operationally	No Go	
<b>Bar Crossing Experience</b>	Very experienced	0	Some experience	15	No experience	No Go	
<b>Bar Crossing State</b>	Safe	0	Difficult	20	Unsafe to cross	No Go	
<b>Total Calculated Risk Assessment</b>					Score =		
<b>Overall Risk Assessment</b>				<b>TICK</b>	<b>Name / Signature</b>	<b>Date / Time</b>	
Low Risk = 0 - 75							
Moderate Risk = 76 – 150							
High Risk = Greater than 150							
No Go							
<b>Final Decision:</b>							
(List the things that are being done to reduce the identified risks that you believe make it reasonable to launch i.e. Eliminate, Isolate, or Minimise).							

## **8. Human Factors**

Safety, and hence risk, may be compromised by stress, fatigue, over-reliance (e.g. on electronic aids, own ability), distraction, complacency and transitioning between tasks.

### **Stress and Fatigue**

While at the start of a mission crew may be in good health and properly rested, over time this state will change and crew will become fatigued. Factors that are likely to influence fatigue may be environmental and physical (such as seasickness or heatstroke). In a real situation stress may impair crew responses. Maintaining an awareness of crew needs and state of well-being is very important, as is recognising your own impairments as a result of your stress and fatigue. There should be regular times that, as a leader, you pause and re-assess both yours and your crew's fatigue and stress level. Decisions are more likely to be compromised and risk is likely to be increased when stress or fatigue is elevated and not managed.

### **Over-reliance and Complacency**

Crew, and leaders, can easily succumb to over-reliance, for example, on their own abilities or a single electronic navigational aid. It is important to maintain an accurate mental model of the position of the vessel relative to hazards. This is achieved by constantly comparing data from a variety of sources. Updating your mental model ensures that you have an accurate picture of the current situation and are better placed to make informed and safe decisions.

Being over-familiar with your surroundings, standard operating procedures, tasks and crew can lead to assumptions about what will happen next may turn out to be wrong. The mental model that has been developed and embedded can result in crew, and leaders, making assumptions. By not interpreting data and being aware of the changes in their surroundings, situational awareness becomes lost, risk increases and decisions can be poor.

### **Distraction and Transition**

There are some tasks that are harder to complete at the same time effectively. In such a situation it is more likely that you transition between the tasks therefore dropping on task and picking up another. This may lead to neither task being completed or resulting in a lack of data for maintaining situational awareness. Task transitions between crew need to be managed so that key responsibilities are not neglected.

Sources of distraction can be on or off the CRV, because the CRV is a familiar environment it is easy to be distracted from those tasks required to maintain a safe passage. Managing distractions can be facilitated by planning, using SOPs, monitoring crew interaction and communicating clearly and regularly to keep crew on task.

## **9. Decision making**

### **9.1 Standard Operating Procedures (SOPs)**

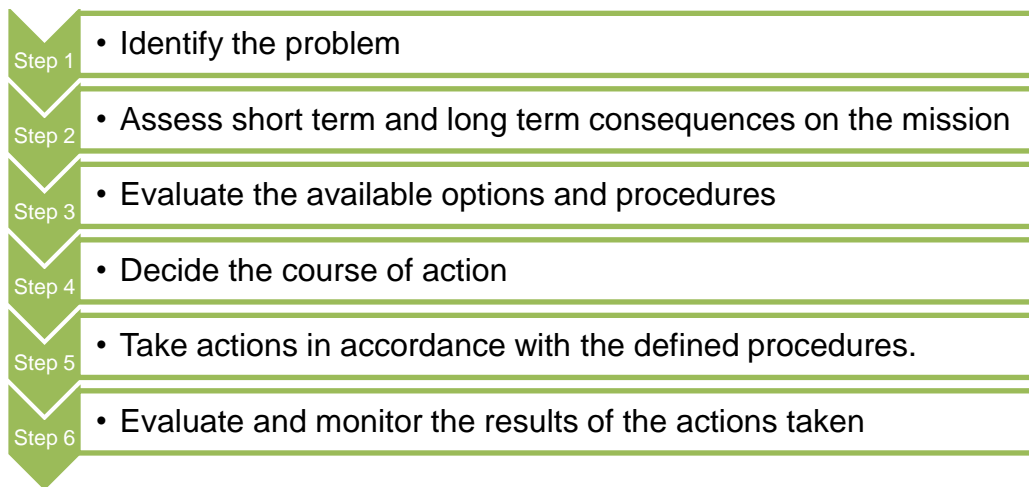
SOPs outline safe and accepted ways of operating in certain conditions and are the basis of CRM. Resources, equipment, vessels and environmental conditions differ by unit and SOPs are adapted to meet regional requirements. The use of checklists and operational parameters are pivotal to reducing the pressure on crew to decide what to do and they safeguard against biased decision making. In keeping with the principles of CRM, any decision making model used should use available crew resources to their best effect.

However, not all situations can be accounted for in the SOPs and it may be necessary for a skipper or senior crew to make decisions when involved in a mission using all the tools at their disposal to come up with the safest possible solution. Good situational awareness will enhance the quality of decisions made.

### **9.2 Decision making Model**

Situational awareness must occur before decisions are made. We act in order to reach certain goals and use our mental models to anticipate the outcome of our actions. In this way situational awareness feeds into the decision making process. We then compare the results of our actions with the intended outcome so that we can modify our actions. This kind of feedback is essential to the decision making process. Another way of considering decision making is to follow a clear model, like the one that follows.





This anticipation and feedback help to keep our mental models true to the actual environment around us. If what we expect to happen and what is actually happening do not match, then we may have to adjust our goals and actions.

*As we look ahead into the next century leaders will be those who empower others*

*Bill Gates*

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*People buy into the leader before they buy into the vision*

*John Maxwell*

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*It is not the strong or the intelligent who will survive, it is those who can manage change*

*Charles Darwin*

# Appendix 1

The key recommendations of the Transport Accident Investigation Commission (TAIC)

Marine Occurrence Report (2011).

TAIC Recommendation	CNZ Response
<b>Recommendation 1</b>	
<p>It is a safety issue that the system for tasking a Coastguard rescue vessel does not always ensure that the people responsible for tasking or operating the vessel are in possession of sufficient information to make a prudent decision on whether the task should be undertaken. Further, a person independent of the crew should always be involved in the decision process.</p>	<p>Coastguard to develop and implement a nationwide standard that supports measured decisions based on the maximum available information when tasking coastguard assets. As the environment we operate in is dynamic we see the investment in the decision making skills of those in charge as, if not more, valuable than a system or process and will continue to pursue this as our primary outcome.</p> <p>Training component is being addressed within the CRM for CRV Masters and the Duty Officer or nominated Ground Person as part of the current Training Development Project to be completed for implementation from July 2011.</p>
<b>Recommendation 2</b>	
<p>It is a safety issue that there are shortcomings in the standard of navigation training applied by Coastguard crews particularly for navigation at night and in poor weather conditions.</p> <p>It is recommended that the Chief Executive of The Royal New Zealand Coastguard Inc. ensures that all Coastguard crews achieve a high standard of navigation skills for all Coastguard crews commensurate with the worst case scenario of conducting rescues at night and in bad weather.</p>	<p>Coastguard volunteer (CoC) training will include high standard of navigation skills commensurate with worst case scenario of conducting weather at night and in bad weather.</p> <p>This is being addressed as part of the mandatory competency level for Operational Crew as well as an advanced navigation skill set for Senior Crew, through a new course being designed as part of the current Training Development Project to be completed for implementation from July 2011.</p>
<b>Recommendation 3</b>	
<p>It is a safety issue that the Coastguard did not have a process requiring its crews to undertake pre-departure planning when tasked to an incident thus</p>	<p>All Units have requirements as part of the Safe Ship Management System (MNZ) for standard operating procedures for pre-departure planning. Coastguard</p>

<p>increasing the risk of an accident occurring en-route to the incident area.</p> <p>It is recommended that the Chief Executive of The Royal New Zealand Coastguard Inc ensures all Coastguard crews conduct an appropriate pre-departure plan , that includes a risk assessment, and that the plan is reassessed at appropriate times as the rescue scenario unfolds.</p>	<p>will develop and implement a National standard for pre-departure planning that includes a risk assessment process and reinforces the SAPP requirements laid out in the Coastguard Boat Book,</p> <p>The application of pre-departure planning will be regularly reviewed as part of the Unit Capability Reports completed by Regional Operations Managers. It will also and incorporated into the CRM for CRV Masters as part of the current Training Development Project to be completed for implementation from July 2011.</p>
<p><b>Recommendation 4</b></p>	
<p>It is a safety issue that the Coastguard did not extend the training in the concept of crew resource management to all members of the crew so that the crews could work cohesively as a team to maintain situational awareness, monitor the plan, anticipate dangerous situations, acquire timely information and avoid pre-occupation with minor problems.</p> <p>It is recommended that the Chief Executive of The Royal New Zealand Coastguard Inc incorporates in its training regime for all crew from the very early stages the concept and use of crew resource management as a means of achieving its goal of optimum safety and efficiency in the operation of its vessels.</p>	<p>Coastguard will develop and implement training from the recruit stage to develop a culture that increases individual's appreciation of the personal and team responsibility. This will improve the cohesiveness of the team to maintain situational awareness, monitor the plan, anticipate dangerous situations, acquire timely information and avoid pre-occupation with minor problems.</p> <p>This will be addressed as part of CRM for all crew members as part of the current Training Development Project to be completed for implementation from July 2011. This will also be applied retrospectively to existing crew.</p>
<p><b>Recommendation 5</b></p>	
<p>It is a safety issue that there appears to be a disparity between the operating limits and designation of the Coastguard vessels and the types of extra curricular work the vessels are engaged in and the qualification requirements of the skippers of Coastguard vessels.</p> <p>It is recommended that the Director of Maritime New Zealand considers some means of aligning the qualifications of Coastguard certificated skippers with the qualifications structure of Maritime New Zealand to ensure that the Coastguard certification better serves the needs of its skippers with respect</p>	<p>Current Coastguard training requirements exceed those required for a number of the MNZ Commercial qualifications so alignment is overdue and would be strongly supported by Coastguard</p>

<p>to operating limits, designation of vessels and anticipated work to be undertaken.</p>	
<p><b>Recommendation 6</b></p>	
<p>Better search and rescue efficiencies and a safer coastguard operation could be achieved if the design and type of vessels assigned to individual coastguard units are compatible with the conditions they are more likely to operate in and easily integrate with other search and rescue resources available locally and nationally.</p> <p>It is recommended that the Chief Executive of The Royal New Zealand Coastguard Inc review the coastguard fleet with a view to achieving standardization of design, suitability for likely operating conditions and the best fit with other search and rescue resources both locally and nationally.</p>	<p>Coastguard is responsible for the Coastguard Rescue Vessel fleet and is currently identifying funding to undertake the Vessel Standardisation Project as identified in the 2020 Vision document:</p> <p>Rescue Vessel fleet built to agreed plans and process Classes of vessels agreed and replacement aligned with fit for purpose identified through evaluation. Standard fit out to agreed National standard Coastguard is also progressing a Coastal Evaluation Tool for use with current and future resourcing.</p>