Crew Resource Management 1

Contents

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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 providing as much detail as possible. Thank you.

Overview

Human error is widely accepted as the most common contributing factor in accidents at sea. These human factors can be addressed by Crew Resource Management (CRM).

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. CRM emphasises the use of all resources available to the crew of a vessel, including equipment and people.

1. Principles of CRM

Human error is widely accepted as the most common contributing factor in accidents at sea. These human factors can be addressed by CRM. Most accidents are caused by:

- Becoming consumed by minor technical problems.
- Failure to set priorities.
- Failure to properly communicate plans.
- Inadequate monitoring.
- Failure to use all available data.
- Failure to identify and act upon deviation from SOP.

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. CRM emphasises the use of all resources available to the Crew of a vessel, including equipment and people.

CRM is an approach to improving safety

Those various skill elements that make for effective CRM can be grouped into five categories (see diagram).

Activity:
Essential CRM Skills

In groups of 3-4, and without discussing the definition of each skill, have every person rank the skills in order of importance to them. Then have each person in the group discuss their own order.

- Ask the group to come to a consensus for the top two skills.
- Discuss the top two as a class. Is any one skill more important than another?

CRM is based on the principles that:

- Effective performance depends on both technical (hard) and interpersonal (soft) skills.
- Developing interpersonal skills requires active participation.
- Effective communications are essential.
- Effective standard procedures are essential (SOPs and
- checklists).
- Crew members' attitudes and behaviours are important.
- All crew members are responsible for the performance of the team.

2. Contributing to a Team

Everybody on a CRV has a different role to play. During a CRV callout or at any other time the roles on a CRV are:

Skipper

- Responsible for the overall safety of the Crew and vessel. They should not be directly involved in any one task.
- The Skipper needs information from all human and non-human sources in order to make the best decisions.

Crew Members

- Responsible for themselves and the rest of their crew. The roles assigned by the skipper include helm, navigation, radio communications and lookout.
- As part of a team, crew often come together to perform a specific task, and an individual crew member is likely to find themselves in different teams at different times.

Refer to the 'Stop, Assess, Plan' process.
- Who initiates this?
- What is involved at each stage?
- What is the difference between assessment and planning?
- During the 'Assess' phase, what are the possible 'human' and 'non-human' sources that can be referred to?

Over time, teams will usually follow these stages of development:

Forming: Crew are polite, do what they are told and listen to the Skipper.

Storming: As Crew get used to each other, conflicts and challenges emerge, they get to know one another's strengths and weaknesses and start to work together.

Norming: Crew develop ways of dealing with conflicts,

Performing: Crew are proactive, problem-solving and have reduced dependence on the leader.

Adjourning: Having completed the task the team debriefs and moves on.

It is important that all crew have a clear understanding of all roles, and that knowledge is shared. This means everyone communicates with everyone else.

3. Communicating Effectively

Good communication on board is essential for the safe an efficient operation of a CRV. The crew that works in silence, with little or no

verbal communication, may give the impression of professional efficiency. They may indeed be an experienced, highly competent crew who are used to working together. This lack of verbal communication however, will sooner or later lead to someone assuming incorrectly that a task is being attended to, or has been completed.

Assumptions like these will one day inevitably result in damage to vessel and / or crew. A crew which is used to such a 'silent' culture on board the CRV may find itself in trouble in complex or high pressure situations, or where their normal standard of communications is inadequate, i.e. when it's pitch black and blowing a gale.

'Open' means that the concerns, comments and opinions of crew members can be expressed.

'Interactive' means that every member of the crew participates in the process of communication.

The quality of communication on board is determined by several factors. Communication should remain open and interactive. It is also vital to avoid misinterpretation. On board a CRV a system called 'closed-loop communication' is encouraged.

3.1 Closed-Loop Communication

In closed-loop communication the sender transmits the message, and the recipient acknowledges by repeating back all the important information. The sender then confirms the accuracy of what the recipient understood.

This may sound complex, but is something which is commonly used on CRV's - for example the repetition of helm orders. This may sound complex, but is something which is commonly used on CRV's - for example the repetition of helm orders.

Using the closed-loop system of communication can initially make people feel a little self conscious. However, it is a habit that should be adopted and encouraged for the safety of all on board.

> Skipper: "Alter course to 275 degrees"
> Helm: "275 degrees"
> Skipper: "275"

This form of communication should not just be confined to helm orders, but should be used every time important information is exchanged.

> Helm: "Turning to Port, hold on!'
> Crew: "Ok / holding on"
> Helm: "Turning!"

> Skipper: "Mike - ease out the towline to around 50m, and make fast"
> Mike: "Ease to 50m and make fast"
> Skipper: "Thanks Mike"

Since verbal communication is so important within a SAR Crew, messages must be clear and direct. There are a number of different strategies that can be used to ensure that information on board the CRV is conveyed quickly and accurately.

3.2 Communication Strategies

- Say the person's name and wait for a reply or an acknowledgement before giving the message.
- If possible make direct eye contact.
- Direct your speech to ensure that you've been heard.
- Acknowledge any requests / commands by repeating the key information (closed loop).
- If you don't understand the information given to you, ask that the instruction be repeated or explained.
- Do not shout or swear - only shout when there is imminent danger and there is no better way of alerting others.

3.3 Briefing

Briefings and debriefings are one of the most 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.

Expect a briefing prior to a task being undertaken. This may require holding back from an emergency situation for a few minutes, so that all the necessary information to ensure the safety and efficiency of the mission, is communicated. A briefing should clearly and concisely summarise the key points: The plan, variables and risks, safety elements, goal and desired outcome.

A briefing must be interactive. Contributions from other crew members should be welcomed. After a briefing, every crew member should know what their responsibilities are.

Answer all questions. Allow everybody the opportunity to ask last minute questions before ending the briefing.

Ninety-five percent of our communication is non-verbal. This includes eye movement, tone of voice, posture, facial expressions and hand gestures. Be aware of non-verbal communication.

An effective briefing method is the GSMEACR approach.

Briefings ensure that critical information is shared by all Crew, and the mission plan and objectives are clear.

Ground	
Setting the scene. This is a 'big picture' orientation for the Crew (the 'where' element).	
Situation	
Contains accurate information about what has happened, what the situation is now and why the team is involved.	
Mission	
This is the overall outcome.	
Execution	
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 required 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.	

3.4 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.

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Three essential elements of a debrief are:

- Timeliness – the debrief should occur as soon after the mission as possible.
- Improvement – there must be opportunity to reflect on and learn from the crew experiences.
- No blame – all crew contributions are welcomed and everyone's viewpoints are expected and respected.

3.5 Challenge and Response

Challenges provide a way for crew to question or clarify an action or decision based on their understanding of the situation. Challenges are a safety measure, since mistakes in judgement can happen at any time by anyone.

Steps in a challenge:

- A command task is given.
- The situation moves beyond the scope of the task (something changes or is not clear).
- A challenge is issued by the crew.
- A considered response is given and if necessary the command task modified

The answer given to a challenge is as important as the challenge itself. When you are responding to a challenge always check its validity - never just dismiss it out of hand. Be diplomatic. Never laugh at someone who has issued a challenge as this may discourage future challenges.

An example of a challenge:

> Skipper: "We'll turn to port at the fourth red buoy."
> Crew: "Port at the fourth red buoy…"
> Skipper: "That's right."

Later:

> Skipper: "OK. Turn to port now."
> Crew: "But … don't we have another buoy to pass before we turn?"
> Skipper: "Ah! You're right. We'll turn after the next buoy."

Notice that when the situation moved outside the limits set, the Crew issued a challenge and the Skipper responded.

4. Situational Awareness

Situational awareness involves consciously considering those factors around you and having an ability to project what the effect of these might be in the near future. The main factors impacting situational awareness will be:

Activity:
Use an example of an accident or incident from the MNZ publication 'LOOKOUT!'

"Jet boats meet head-on while travelling blind"
(Issue 27, Dec. 2012)

A breakdown in communication led to two jet boats speeding towards each other in a narrow stream and colliding on a blind corner. The collision occurred while friends were enjoying a day out exploring local waterways.

- Provide a copy of the article without the 'LOOKOUT!' points.
- Discuss the factors that compromised situational awareness.
- Relate this to the CRV – how easy is it to be placed in a position where you may compromise the safety of the CRV or mission?

Debriefs are an opportunity to revisit or refresh on safety points and standard operating procedures.

It is essential to ensure that teams have a culture that allows and encourages challenges.

Lookout! A Maritime New Zealand publication features the lessons to be learnt from recent maritime accidents or incidents. Use these incidents and accidents as examples in your teaching.

- Spatial orientation: that is, awareness of your geographical position.
- Environmental: 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.
- Crew: that is, awareness of the crew health and wellbeing, which may include fatigue, stress, distraction and complacency.
- Time: that is, awareness of time management.
- CRV Systems: that is, awareness of the systems on the boat and their status. The absence of situational awareness causes accidents. A loss of situational awareness can lead to inadequate inappropriate actions.

5. Stop, Assess, Plan

When things go wrong on an operation, and crew members get hurt it usually stems from one of two problems:

- A loss of situational awareness.
- A bad plan of action.

Crew need to observe the scene carefully and notice all the details then formulate and agree to a plan before getting involved. When faced with a potentially hazardous situation proper assessment is the key to a successful outcome. What is emphasised in SAP is that all the crew, not just the Skipper are involved in both the assessment and planning stage. If it's only the Skipper assessing the situation, then the whole operation is dependent on one person's evaluation - and no one is infallible.

Using SAP, a crew can:
- Identify all the hazards at a scene.
- Receive input from all crew members.
- Formulate a plan that best fits the situation.
- Assign tasks / roles for each crew member.

Plans should not be made before arriving at the scene. The situation that a CRV crew may expect, based on prior information, may well be

A valuable tool for maintaining situational awareness on a mission is SAP.

A few moments standing away from the action observing and formulating a plan will save time and possibly lives.

SAP can be as short as fifteen seconds for routine situations such as taking a vessel in tow, and could take several minutes for more complex or hazardous situations.

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different from the actual situation upon arrival. When the CRV crew arrives they should always take a fresh, unbiased view of the scene.

5.1 Stop

It is critical to stop outside the immediate area of the incident for an initial assessment. It is the small or partially hidden factors that can quickly turn an operation into a disaster.

Once you have entered the immediate area of an incident you are within range of any dangers that may be present, and involved in the scene. The urgency of the incident can compel people to act instinctively, however this is often not the best course of action.

Stopping may involve;

- the CRV coming to a complete stop
- the CRV staying underway, to slowly circle a scene
- pacing a vessel whilst underway in order to keep a constant position.

5.2 Assess

All of the crew must be encouraged to contribute to the assessment phase. Contributions are simply comments based on observations.

At this stage crew are not planning, they are just assessing the situation. Details can make a profound difference.

"I can see lines in the water off the stern"
"Looks like she's listing to port and down at the bow"
"There's fuel or oil on the water"

If the scene is complicated, it may be necessary to have a few seconds of silence while crew observe; this gives time to focus on the task of observation.

Very seldom is a situation so urgent that a team does not have time to stop, assess and plan.

The SAP tool should become embedded as a process that is used in every situation. This will aid situational awareness, reduce risk and prevent poor decision making.

Challenge provides a way for Crew to question or clarify an action or decision based on their understanding of the situation

5.3 Plan

All crew are involved in developing the most effective plan for the situation and the Skipper has the final say. Once a plan is decided the Skipper assigns tasks and gets verification from the crew that they all understand the plan, and their individual roles. Sometimes situations can change and turn a good plan into a bad one. If the Skipper and crew can foresee potential problems then a backup plan should be discussed.

6. Risk Assessment and Decision Making

Every mission that the crew are involved with involves risk. All risk needs to be assessed. Crew welfare and safety is paramount. It is important to accept no unnecessary risk and make decisions that have been carefully weighed against all the risks present. Each Unit will have their own risk assessment tools 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.

Situational awareness must occur before decisions are made. We act in order to reach certain goals and use previous experiences to anticipate the outcome of our actions. In this way situational awareness feeds into the decision making process.

Non-routine decisions require additional information and crew should contribute their ideas. The SAP process is a useful tool for this type of decision making.

Standardised procedures (called Standard Operating Procedures, SOP) can be used to make routine decisions. SOPs outline safe and accepted ways of operating in certain conditions. Each unit will have their own SOPs that are specific to their CRV and area of operation.

Activity:

What risk assessment happens at the unit level?

Use an example of the unit risk assessment and provide a situation to discuss. For example, the CRV has been tasked to tow a vessel from a known location.

Have the crew complete a risk assessment based on the weather, crew levels, experience, and other factors.

- When would it be a 'no-go?'
- Have the more experienced crew share examples of missions that have had a high risk.
- How was this risk managed?

"By itself Crew Resource Management is not a blueprint for success; but when combined with the rest of our professional training and experience, it provides a wider horizon for seeing how things go wrong on the vessels and how to defend against human error."

(p160, Parrott, 2011)