

TAFADZWA
SEARCH OPERATION
INDEPENDENT REVIEW



Commissioned by the New Zealand
Search and Rescue Council

Paul Fitzharris

May 2010

Table of Contents

Executive Summary	3
Introduction	5
Approach Taken	6
Structure of this Report	7
Findings	8
TOR point 1: To gain an understanding of the sequence, times of events and key decisions relating to the search and rescue operation (SAROP) in relation to the yacht TAFADZWA.....	8
TOR point 2: To ascertain whether the current search and rescue arrangements and procedures were followed by the Rescue Coordination Centre New Zealand (RCCNZ).....	13
TOR point 3: To ascertain whether the current search and rescue arrangements and procedures utilised are appropriate for an incident of this nature.....	14
TOR point 4: In particular to review the following specific aspects of the RCCNZ coordination of the SAROP and consider the appropriateness of:.....	15
TOR Point 4 (a) Determining the Search area	15
TOR Point 4 (b) The method and assets used to conduct the search	21
TOR Point 4 (c) Suspension	25
TOR Point 4 (d) Family liaison and support arrangements.	27
TOR point 5: To make recommendations as appropriate to the New Zealand Search and Rescue Council.....	29
Appendix One Terms of Reference	30
Appendix Two Interview Schedule	31
Appendix Three Suspension of Search Criteria.....	32
Appendix Four RCCNZ Staff Backgrounds	36
Appendix Five Coordination of Search and Rescue activities	40
Appendix Six About SARMAP	41

EXECUTIVE SUMMARY

This Independent Review was directed by the Search and Rescue Council¹ following an official search for a missing 11 metre yacht, named Tafadzwa, which had left Tauranga on 12 March 2010 with an intention of sailing to Gisborne. The sole yachtsman, Paul Janse van Rensburg, had intended to arrive on 14 March to commence a new job the following day. When he failed to arrive his yacht was reported missing on the afternoon of 15 March 2010.

The Review's Terms of Reference are contained at Appendix One. Summarised these could be described as:

- To gain an understanding of the search and rescue operation for the Tafadzwa;
- To establish if the Rescue Coordination Centre New Zealand (RCCNZ) adhered to its own procedures;
- Whether these procedures were appropriate for an incident of this nature;
- How was the search area determined;
- How was the search conducted, and what were the processes used to determine the assets used in carrying out the search;
- How was the decision to suspend the search taken; and
- To Review the family liaison and support arrangements.

The RCCNZ has comprehensive arrangements and procedures contained in a Manual titled "RCCNZ Procedures Manual – Standard Operating Procedures". This manual defines the roles and responsibilities for planning and coordinating searches. With the RCCNZ Operations Manager I pedantically worked through this Manual to test the procedures followed by staff for this search. I found that the RCCNZ did follow their arrangements and procedures.

The processes and procedures contained in the Manual are continuously reviewed and informed by the extensive history of searches the RCCNZ has been involved in. The Review found in general, because of this continual review, that the Manual containing the policy, procedures and guidelines for search and rescue operations is generally comprehensive and appropriate for its purpose. However I have suggested two amendments to the Manual in respect to:

- The suspension process; and
- The section related to dealing with next of kin.

It has been noted that steps are being taken to digitise this Manual which will be an improvement.

Once the RCCNZ decide to conduct a search for a missing vessel the process to determine the search area includes the use of specialised software. The software is

¹ The Search and Rescue Council consists of chief executives or senior level executives of:

- The Ministry of Transport (Chair)
- New Zealand Police
- New Zealand Defence Force
- Civil Aviation Authority
- Maritime New Zealand

known as SARMAP, which predicts the path of floating objects. It relies on environmental data such as wind and currents, physical data such as the coastline, and the drift characteristics of the missing vessel. The Review outlines this process in detail. In addition to the assistance of the SARMAP technology, RCCNZ conducted a range of enquiries from other vessels in the area and likely sheltering places to determine an area of search. The wishes of the next of kin and friends of Paul Janse van Rensburg also played a part in the search area determination. The Review concludes that the processes and procedures used by the RCCNZ were appropriate for this search.

In conducting the search for the Tafadzwa the RCCNZ used:

- i) Broadcasts to other vessels in the search area
- ii) Utilising vessels in the area to search for the Tafadzwa
- iii) Aerial searches
- iv) RCCNZ experience (which is considerable)

Attempts were also made to utilise Satellite technology but, because this technology is in its infancy for search and rescue, it did not prove effective and was not pursued.

The next of kin and friends of Paul Janse van Rensburg undertook aerial searches and made enquiries. Much of this was not coordinated with the RCCNZ. The Review recommends that RCCNZ should maintain a liaison with next of kin and friends, not only because it may assist the official search, but because it would likely reduce the opportunity for criticism of RCCNZ.

One element of the private search disclosed that a 'fish spotter' (professional pilot) with a major fishing company was utilised. Up to seven separate aircraft spotting fish are routinely searching the New Zealand coastline, and this resource has not been used by RCCNZ.

Suspension of a search is a significant event and is treated in a very deliberate and careful manner, with authority for such action taken at the highest level of Maritime New Zealand. In this case, RCCNZ followed their processes and procedures and in the Review's opinion it was appropriate to do so at the time. However suspension is viewed by next of kin and friends of the missing person virtually as a termination of the search – a website characterised this as "the authorities had given up." In this case RCCNZ enquires and broadcasts for the missing yacht continued and serious consideration was given to a resumption of the aerial search. The Review recommends an amendment to the Procedures Manual to emphasise that when searches are suspended, RCCNZ will still actively seek information and act upon it.

In dealing with the family of the missing person, RCCNZ did a good job and as a summary it is best to express the submission from the family, who stated that "...on all aspects of the search and treated all our communications, suggestions and requests, with the utmost courtesy, respect and sympathy."

The family, however, suggested that this could be enhanced by RCCNZ nominating a liaison officer, with whom they could principally communicate.

INTRODUCTION

On 28 April 2010 I was contracted by the Manager of the New Zealand Search and Rescue Secretariat to undertake an “Independent Review” in respect to a search to locate a yacht named “Tafadzwa” – an 11 metre, steel hulled, cutter rigged yacht.

The Tafadzwa, sailed single-handed by South African Paul Janse van Rensburg, sailed from Tauranga at around 8.30am on Friday 12 March 2010, with the intention of sailing around the coast via the East Cape to Gisborne. The estimated arrival at Gisborne was to be about 11pm on Sunday 14 March 2010.

On Monday afternoon, 15 March 2010, the Police and RCCNZ were advised of concern for the yacht and Paul, when he failed to turn up that day for a new job. Enquiries to locate the yacht were commenced that afternoon by Police and the Rescue Coordination Centre New Zealand (RCCNZ). Enquires and aerial searches failed to locate the yacht.

On Sunday, 28 March 2010, the yacht was found drifting about 60 nautical miles (110 kilometres) west of the Chatham Islands by an Air Force P3K Orion on a training flight.

The Search and Rescue Council (the Council) was established by Government in 2003, and is composed of the Chief Executives (or delegated to a person from the senior executive level) of the following government agencies:

- a) Ministry of Transport (Chair)
- b) New Zealand Police
- c) New Zealand Defence Force
- d) Civil Aviation Authority
- e) Maritime New Zealand

The purpose of the Council is to provide national level strategic governance to the New Zealand Search and Rescue (SAR) sector.

The Council has the following objectives.

- a) To provide strategic search and rescue policy advice to government.
- b) To provide strong strategic coordination and leadership for all search and rescue strategies (sea, land, and air) within New Zealand’s search and rescue region.
- c) To provide a centralised public voice for strategic SAR issues.
- d) To monitor New Zealand’s international SAR obligations and provide strategic advice to the Government when needed.
- e) To establish and maintain New Zealand’s Search and Rescue
 - o Vision
 - o Mission
 - o Goals
 - o Planand to monitor performance agreements and goals within the plan.

The Council is supported by a Secretariat, which is located at the Ministry of Transport in Wellington.

The coordination of a Search and Rescue Operation (SAROP) is undertaken by one of the two recognised Coordinating Authorities in New Zealand. These are the New Zealand Police, and RCCNZ. The policy for the coordination of search and rescue activities is attached at Appendix Five. The key points of the policy are reproduced here.

New Zealand Police are the Coordinating Authority for all Category I SAROPs.

A Category I SAROP is coordinated at the local level; including land operations, subterranean operations, river, lake and inland waterway operations and close-to-shore² marine operations³.

The Rescue Coordination Centre New Zealand is the Coordinating Authority for all Category II SAROPs.

A Category II SAROP is coordinated at the national level; including, operations associated with missing aircraft or aircraft in distress and off-shore marine operations within the New Zealand Search and Rescue Region⁴.

Since July 2004 the RCCNZ has been managed by Maritime NZ and operates a 24 hour service, 365 days a year. It operates from Avalon, Lower Hutt.

I was given a range of documents by the NZSAR Secretariat which included the "RCCNZ Procedures Manual" consisting of three folders. In addition I was given three folders containing documents related to the search for the Tafadzwa.

APPROACH TAKEN

The approach I took to this Review was to spend some time reviewing the "RCCNZ Procedures Manual" and the three folders giving a comprehensive account of the search by RCCNZ for the Tafadzwa. These latter documents gave me a detailed understanding of the steps taken by the Police and RCCNZ in their effort to locate the missing yacht.

I reviewed the documents provided by the Police regarding their enquiries and search for the Tafadzwa. I also spoke to the key police involved in this search.

I spent two days with the RCCNZ reviewing their processes and procedures.

² The nature of 'close-to-shore' will vary according to the availability of local resources and the need to task national assets. Typically such operations will be within NZ Territorial Waters (12 nautical miles).

³ Category I SAROPs typically require the use of local personnel and resources and can be carried out efficiently and effectively at the local level.

⁴ Category II SAROPs typically require the use of national or international resources and may involve coordination with other States.

I spoke to the next of kin of Paul Janse van Rensburg, and arranged for an email to them regarding the terms of reference for this Review, seeking any comment they may wish to make.

I spoke to the Operations Manager for the Australian Maritime Safety Authority to establish their procedures for commencing a search for missing yachts at sea, how they determine search areas for missing vessels, and the technology they use for that purpose.

I spoke to a total of 14 persons and these are outlined in Appendix Two.

Everyone I spoke to with regard to this Review was most co-operative and provided me with a considerable amount of documents and photographs. I was also able, at the RCCNZ, to listen to and review a range of telephone conversations that they had with various parties involved with this search. This was very helpful in giving me a greater understanding of the search and further insight into several of the documents that I had been provided.

I was grateful for the support given to me by Duncan Ferner and Carl van der Meulen from the New Zealand Search and Rescue Secretariat.

STRUCTURE OF THIS REPORT

This report has been structured to reflect the requirements of the Terms of Reference (TOR), which for clarity are set out here, and further outlined at Appendix One.

1. To gain an understanding of the sequence, times of events and key decisions relating to the search and rescue operation (SAROP) in relation to the yacht TAFADZWA.
2. To ascertain whether the current search and rescue arrangements and procedures were followed by the Rescue Coordination Centre New Zealand (RCCNZ).
3. To ascertain whether the current search and rescue arrangements and procedures utilised are appropriate for an incident of this nature.
4. In particular to review the following specific aspects of the RCCNZ coordination of the SAROP and consider the appropriateness of:

- a. The processes, procedures and decisions made to determine the positions and sizes of areas to be searched given the information available at the time.
 - b. The process, procedures and decisions made relating to the method and assets to be used to conduct the physical searching of the calculated search areas given the information available at the time.
 - c. The process, procedures and decisions made relating to the formal suspension of the SAROP given the information available at the time.
 - d. Family liaison and support arrangements.
5. To make recommendations as appropriate to the New Zealand Search and Rescue Council.

FINDINGS

TOR point 1: To gain an understanding of the sequence, times of events and key decisions relating to the search and rescue operation (SAROP) in relation to the yacht TAFADZWA.

At around 0800 hours on Friday 12 March 2010, the yacht Tafadzwa left Tauranga harbour with the intention of travelling around the East Cape along the coast to Gisborne. Paul Janse van Rensburg, the sole sailor expressed his intention to arrive in Gisborne on Sunday 14 March at around 11pm, and then to commence a new job in Gisborne on Monday 15 March.

The Tafadzwa is a single mast steel yacht approximately 11 metres long (described as of multi-chine construction). It was well equipped including an EPIRB, two cell phones, an array of life jackets, a life raft and other safety equipment.

Paul Janse van Rensburg, a South African national who has considerable ocean going yachting experience was alone, except for his dog named Juanita.

The yacht was sighted motoring out of the harbour at 0830 hours, and at 0902 hours he sent a text message to his partner indicating the weather was 'calm off the Mount and expecting wind soon'. At 1410 hours he left a voice message on her phone to say bye, as he was about to go out of cell phone range. This was the last that was heard of Paul.

On Monday 15 March 2010, at around 1300 hours, the fact that he had not turned up in Gisborne was reported to the Police. They commenced enquiries with his intended employer in Gisborne, notifying Police in Tolaga Bay, and making enquiries from Tauranga Bridge Marina. They also commenced enquiries with Telecom to establish

if there was further activity from either of Paul Janse van Rensburg's telephones. Soon after this, they reported their enquiries to RCCNZ.

At 1300 hours on Monday 15 March 2010 the RCCNZ was first notified of the missing yacht through the Police Communications Centre. A log was commenced and in terms of RCCNZ procedures they put the incident into what is termed an "Uncertainty Phase". This dictates that further enquiries should be made to establish whether the vessel was delayed because of circumstances such as poor sailing weather and resources such as aerial searching would be premature. This phase includes what RCCNZ terms a 'Communications Search'.⁵

Throughout the afternoon they conducted enquiries of the nature outlined for a 'Communications Search', including contacting vessels in the intended route of the Tafadzwa to elicit any information on its whereabouts.

The RCCNZ had at the outset determined that this was a Category II incident, therefore indicating they would take responsibility for the search.

Throughout the afternoon and evening RCCNZ reviewed the situation and initially concluded that the yacht may have been merely overdue because of the weather conditions. The day the yacht left a storm was reported in the area that night. Their experience was that it is not unusual for yachts to seek shelter at such times. Also the weather reports indicated that the yacht may have been slowed in its progress to Gisborne. As a consequence, before taking further steps such as aerial searching, they would leave the search in the "uncertainty phase" pending further information. At that time their deductions were that if the yacht was delayed because of weather, it may not arrive in Gisborne until Tuesday evening. Therefore they would delay aerial searching until Wednesday morning.

They conveyed this to the Police, who took the view that an early aerial search should be conducted up the coast north of Gisborne, and of their own volition undertook an aerial search in the late afternoon of 15 March 2010. This search by fixed wing aircraft was from just south of Hicks Bay, to just south of Gisborne, and about half a mile off shore. It was conducted with excellent visibility and only about a 1 metre swell was observed. No trace of the Tafadzwa was found.

Throughout the evening, the Police Liaison Officer (PLO) at the RCCNZ and Gisborne Police continued to discuss and debate the issue of when aerial searches should be commenced under the authority of the RCCNZ.

⁵ This involves contacting and checking major facilities in the area - trying to contact the vessel by all appropriate forms of radio equipment – checks that give a thorough and rapid coverage in the area such as harbour masters, marinas, yacht clubs, Police, relatives, private marine radio stations and verification of departure and intended itinerary.

Throughout the night RCCNZ continued checking and receiving reports from other vessels in the area. They also planned to obtain information regarding another vessel that had undertaken a similar journey about the same time as the Tafadzwa.

At 0800 hours on Tuesday 16 March 2010 another shift came on duty and reviewed all the information, including details of a vessel that had undertaken a similar journey. In discussions with the Operations Manager, it was decided to upgrade the incident to that of “Distress”.⁶

At this time planning began for an intensive aerial search. The key aid for this process is SARMAP. SARMAP is a GIS-based search and rescue model used to predict the path of different objects floating in marine or fresh waters. It predicts the movement of floating objects on the water surface. For these calculations the model relies on environmental data such as wind and currents, physical data such as the proximity of the shorelines, and the drift characteristics of the floating object in question. It will calculate the probability of containment, probability of detection, and probability of success (see Appendix Six for description of SARMAP).

By around 0930 hours on Tuesday 16 March, a twin engine fixed wing aircraft equipped with radar search capability was tasked, and at 1100 hours it was deployed. That day, and part of Wednesday 17 March, search tracks were flown parallel to the coast, and out to 180 nautical miles off shore, between Gisborne and East Cape.

On Wednesday 17 March the RNZAF searched a wider area, and their search continued on Thursday 18 March. RNZAF capability for this search was a P3K Orion, equipped with capability for both visual and radar searching. The areas that were searched by these air craft are outlined at Figure 1.

On Thursday 18 March, two helicopters were also deployed to conduct coastal searches covering the entire coastline from Tauranga to Gisborne.

These searches were unsuccessful in locating the missing vessel, or Paul Janse van Rensberg, despite searching areas well in excess of the areas developed by the SARMAP model.

Between them, five fixed wing aircraft (including RNZAF P3K Orions) and three helicopters flew 47 hours, and their combined search area covered approximately 111,000 square nautical miles (381,000 square kilometres).

⁶ “Distress” exists when there is reasonable certainty that the yacht is in danger and requires immediate assistance. This phase can initiate aerial searching.

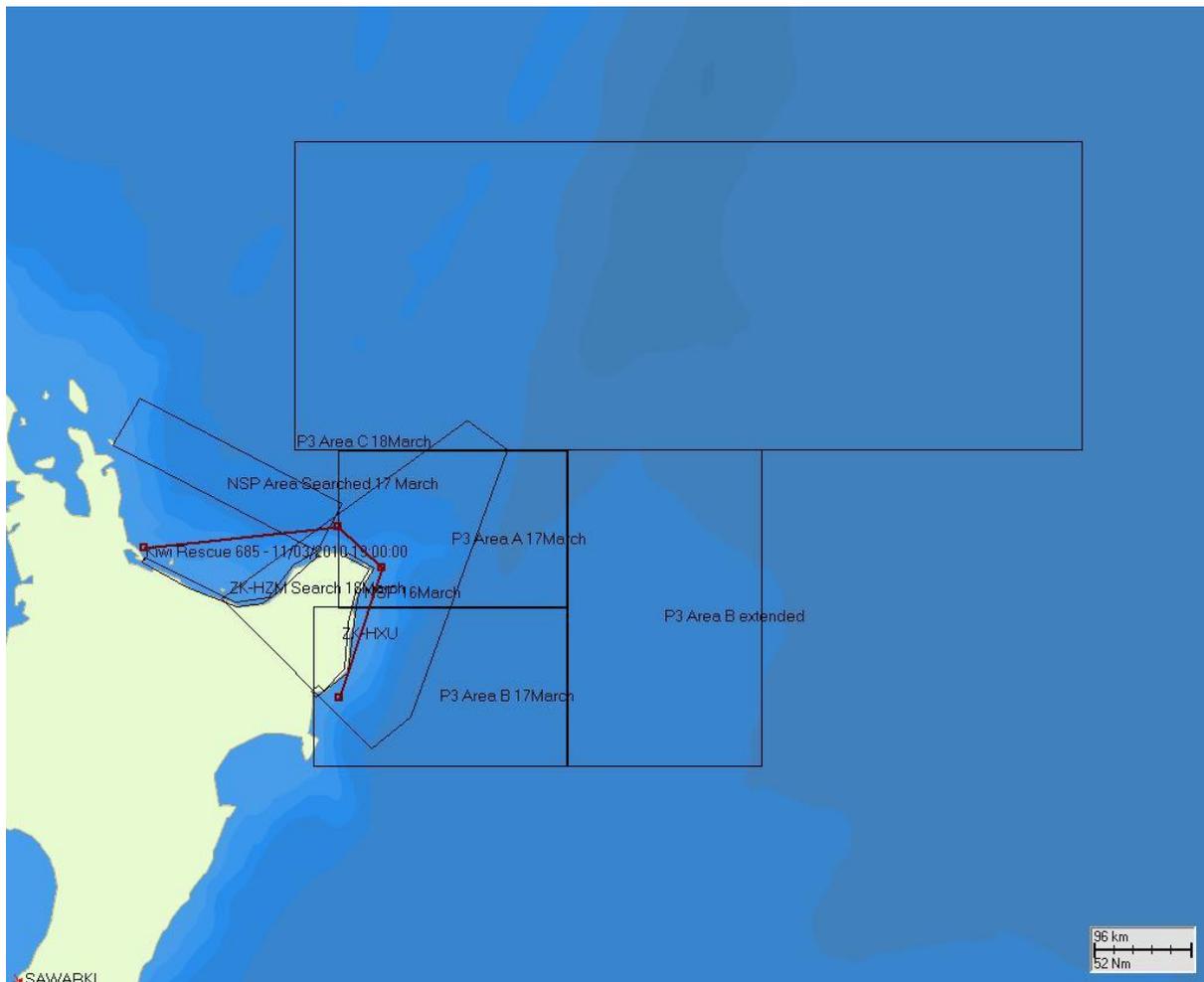


Figure 1 Areas searched by air

Throughout this period of aerial searching, enquiries continued through the RCCNZ, which included various sightings of what could have been the missing vessel. These sightings were provided by various persons and other vessels travelling through the area where the Tafadzwa might have sailed. All sightings were investigated and ultimately discounted as being the missing vessel. Significantly there was no signal from the EPIRB or cell phones, nor any sign of debris from the vessel.

One possibility considered during the search, was that the yacht was still sailing, but not under command. Because of the variables involved, it was not possible to predict with any degree of certainty where it might have gone. Neither marine experts, nor the SARMAP predictive capability, are able to determine which direction a vessel might travel if it is being steered or sailed by a sailor, or with self steering devices. It was understood that Tafadzwa had self steering equipment.

On the night of Thursday 18 March, the RCCNZ took the decision to suspend the search, subject to the receipt of information that would justify resumption of the search.

Nonetheless, RCCNZ continued seeking information on the missing vessel through continued broadcasts and responding to enquiries and information that came to hand.

Friends and family were clearly concerned that the aerial searching had been suspended, and urged RCCNZ to reconsider this decision. This included sailors, friends of Paul Janse van Rensburg, who believed that the search should continue to at least 1,000 nautical miles to the east and north of Gisborne. RCCNZ considered this and developed a plan to do so. The only aircraft capable of such a search so far from the coast (in the New Zealand context) is the P3K Orion operated by the RNZAF. Enquiries were made with the RNZAF as to their availability for such a search. The RNZAF considered this request, and they determined that the search would take 55 search hours, with transit times doubling the flying hours required.

They said “in considering the situation, I am aware the search area is now approx 1,000 nautical miles distant from NZ and in the order of 230,000 square nautical miles. The prospects of success are very low in such a large search area and the additional transit hours to/from a distant search area would limit on-station hours per day. The task would require a sustained commitment over many days (well over a week) to complete, and the area uncertainty would continue to increase. A lengthy task of this nature would likely consume all available crew resources at 5 Squadron and therefore constrain the NZDF’s ability to respond to any new more urgent SAR.”

The RNZAF did say, however, that if any new specific information in respect to distress beacons or sightings came to hand, they would reconsider such a request.

Throughout this period the family and friends sought to use satellite, or other military type technology, to search for the Tafadzwa. As a result RCCNZ asked the United States Coastguard on Sunday 21 March to provide technical assistance of this nature to search over this large area.

Similarly enquiries were made to establish if the French military, based in French Polynesia, had access to satellites that might be able to assist. The advice received regarding this, was that using satellite imagery for SAR activity is in its infancy, and much of the area in question did not have satellite surveillance that was available. In the areas of coverage, the sweeps made by a satellite are so limited that a comprehensive search by this method is not practical. Consequently these methods of search were not advanced.

On Sunday 28 March 2010 the yacht was found drifting about 60 nautical miles (110 kilometres) west of the Chatham Islands, by an Air Force P3K Orion on a training flight. RCCNZ arranged for the nearest vessel (a commercial fishing vessel) to proceed to the yacht. The fishing vessel reached the yacht at nightfall but was unable to board the yacht due to high seas and failing light. Calling to the yacht did

not show any sign of life aboard. The next morning, with some difficulty, they boarded the Tafadzwa and only found the dog, Juanita, aboard. The yacht's life raft, dinghy, emergency beacon and kayak were still on board the vessel. They subsequently towed the Tafadzwa to the Chatham Islands.

TOR point 2: To ascertain whether the current search and rescue arrangements and procedures were followed by the Rescue Coordination Centre New Zealand (RCCNZ).

The current search and rescue arrangements and procedures for RCCNZ are contained in a Manual titled "RCCNZ Procedures Manual – Standard Operating Procedures".

This is a paper based document consisting of two volumes. The distribution of the document is restricted to limited officers within RCCNZ, Police, RNZAF, Maritime Operations Centre, the NZSAR Secretariat, and Maritime NZ.

The Manual contains management and administrative procedures, and details of the manner in which Category II search and rescue operations shall be conducted.

It describes the resources available for search and rescue operations, and defines roles and responsibilities for planning and co-ordinating searches. The Manual covers search and rescue procedures for maritime and aviation incidents, and so only part of the manual is related to incidents where a vessel is reported as overdue.

It is a dynamic document needing to be regularly updated. This can make it a little difficult to follow on first examination. However, with some familiarisation it comes across as very detailed and comprehensive step by step guide in handling search and rescue operations.

One feature of the Manual is that it contains "*Aides Memoire*" for various situations. These provide suggested actions in particular search situations, and it is stressed these are not to be slavishly followed, but are merely guidelines to assist SAR Mission Coordinators (SMC) and Search and Rescue Officers (SARO) in conducting searches.

I observed that the Manual is readily available to staff on duty, and is routinely used and referred to in the course of searches.

On 5 May 2010 with the RCCNZ Operations Manager, I pedantically went through this Manual to test the procedures followed by the RCCNZ.

There was one minor issue pointed out to me that related to informing the Ministry of Foreign Affairs and Trade when foreign nationals were involved in searches. This was initially not deemed necessary, as the Next of Kin from South Africa were being kept informed from the outset of the search. On Tuesday 23 March, a comprehensive report was provided to the South African High Commission in

Wellington. This did not impact on the conduct of the search for Paul Janse van Rensburg, and in my view the omission was inconsequential in this operation.

I found that the RCCNZ did follow their arrangements and procedures.

TOR point 3: To ascertain whether the current search and rescue arrangements and procedures utilised are appropriate for an incident of this nature.

The RCCNZ Procedures Manual is a paper based manual of two volumes in ring binders containing numerous amendments. Being paper based, amendments can be difficult to follow. I note that the RCCNZ has a project currently underway to digitise the manual, which will be a considerable advance in its management.

In general the Procedures Manual is a comprehensive document built up over many years to guide the RCCNZ in their business. It was clear to me that various parts of the Manual have been developed with experience of the many and varied situations that they find themselves co-ordinating. It is indeed a dynamic document.

There are two areas of the Manual I wish to comment on, which can impact on the operation of searches of this nature. These relate to:

- 1) The suspension process adopted by RCCNZ, and
- 2) The section related to dealing with relatives.

1) Suspension Process

The suspension process, as outlined in the Manual, and portrayed to the family and others with a keen interest in the search, can be seen as a conclusion to the search. For instance, on a website established to assist in the search for Paul van Rensburg, it was commented that “*authorities had given up in the search for Paul*”. In fact this was not the case. The reality of what the ‘suspension’ really meant in this case was that the aerial searching had been suspended. It was suspended until further material information came to hand that was specific to the location of Paul Janse van Rensburg, or his yacht. The log showed that a Communication Search was actively continuing, with broadcasts to other vessels, media statements, and enquiries continuing.

When the family and friends were told of the suspension they were disappointed and several of them interpreted this as if the entire effort to locate Paul had been terminated.

The Manual could, I suggest, be amended to reflect this and guide staff when discussing this phase with relatives, so as not to reflect to them that the RCCNZ has ‘given up’. This is discussed further in this Review in respect to TOR Point 4(c) – the ‘suspension process’.

2) Dealing with Relatives

The Manual states: “*The SMC through the PLO, and in some cases the local police, should maintain daily contact with relatives during the search to provide information*

and outline RCCNZ's plans. The SMC/PLO should advise the relatives and/or Next of Kin of missing persons that the search has been suspended. An open, frank and transparent approach should be taken. Relatives and next of kin are normally more willing to accept the decision to suspend operations if they have been allowed to follow the progress of the search."

Whilst this advice is sound, the section does not provide the detailed advice that the remainder of the Manual gives to other matters. Dealing with relatives and next of kin can lead to significant direction of the search, and if not handled properly can lead to adverse criticism both by the family and in the media. In this operation the next of kin thought RCCNZ were empathetic with them and kept them advised, as enquiries and the searching progressed. This topic is discussed further at TOR Point 4 (d) – 'family liaison and support arrangements.'

TOR point 4: In particular to review the following specific aspects of the RCCNZ coordination of the SAROP and consider the appropriateness of:

- (a) The processes, procedures and decisions made to determine the positions and sizes of areas to be searched given the information available at the time.**
- (b) The process, procedures and decisions made relating to the method and assets to be used to conduct the physical searching of the calculated search areas given the information available at the time.**
- (c) The process, procedures and decisions made relating to the formal suspension of the SAROP given the information available at the time.**
- (d) Family liaison and support arrangements.**

TOR Point 4 (a) Determining the Search area

This Review has described how, upon receipt of information from Police of the missing yacht, what action was taken.

Following RCCNZ Procedures Manual, they immediately entered the phase termed "Uncertainty". This indicated that they were responsible for co-ordinating the search and beginning a "Communications Search", which consists of action such as enquiries at local marinas, likely sheltering areas for a vessel caught in bad weather, broadcasts to other vessels in the area, as well as checking weather reports and anything else that might advance the location of the missing vessel.

During this period of "Communications Search" on Monday 15 March there was discussion with Police as to whether an aerial search should commence immediately. My view is that the RCCNZ preliminary enquiries and assessment of the incident (during the afternoon and evening) prior to active aerial searching was appropriate. History shows that many missing vessels are located in this period prior

to aerial searching. Discussions with the Australian Maritime Safety Authority established they generally follow the same processes as RCCNZ in determining when to commence aerial searching.

By 0800 hours on Tuesday 16 March 2010 they decided to conduct an aerial search.

Routinely staff in the RCCNZ adopt a collegial approach to any planning and decisions made. There is always two staff on duty 24 hours in their operational area. Often there are three, and during routine business hours they are supported on site with other senior staff. The senior staff make themselves available outside business hours for advice should searches of this nature arise.

This collegial approach was used in deciding to move from the “Uncertainty” phase to that of “Distress” phase. It was at this point that the RCCNZ began planning for an aerial search. They already had considerable information on the intended route to be taken by the Tafadzwa and a report on the progress of his travel. They had information as to when he used his cell phone indicating he was going around East Cape and out of cell phone coverage. They had his intended time of arrival in Gisborne.

The RCCNZ has a process to determine which area they will search for missing vessels. It is a deliberative process that uses the experience of Search and Rescue Officers, as well as a computer generated programme that predicts the movement of vessels taking into account environmental data such as wind and currents, the proximity of shorelines, and the drift characteristics of the vessel. This computer model is known as SARMAP and detail of this is outlined in Appendix Six.

SARMAP’s accuracy is very dependent on the last known position of the missing vessel and that it is drifting and not under command or being sailed. In this case the Tafadzwa was being sailed with a self steering system. This resulted in a potential search area that would be impossible to cover. RCCNZ described their process to determine the search area as follows:

General SARMAP Information

Datum Point

If the distressed craft or person has provided a position at the time of the distress incident, then the calculation of the search area will commence from this datum point, and will be based upon the expected drift from the time of the last known position to the time when the search craft arrive in the area.

Datum Line

If no distress alert is received, but the intended track of the craft is known, or can be assumed, and an assumption is made that the person/craft became distressed somewhere along this track, then the calculation of the search area will commence

from this datum line. The drift is then calculated in a similar fashion to a datum point search.

Search Objects

The type of drifting object has a direct bearing on the most likely location. Different objects (E.g. yacht, ship, person in the water) will react differently to the current and wind. Formulae assessing the affect of the wind force against the exposed surfaces of the distressed craft (known as leeway) are calculated for different objects. The drift calculations are based on actual drift experiments, conducted in the main by the US Coastguard. For example, different types of life rafts; with and without drogues; with and without canopies are set adrift and their characteristics noted. These resulting formulae are used by Rescue Coordination Centres world-wide, including RCCNZ, to determine drift.

All these calculations are based on an object that is drifting, not making way (i.e. sailing). The possibility that TAFADZWA had sails set and self-steering gear engaged was considered at the beginning of the search. Unfortunately it is not possible to search for a yacht that is sailing rather than drifting. The self-steering gear is set by the sailor to keep the yacht on a constant angle to the wind. The wind during the search days for TAFADZWA swung from westerly, to southerly, then northerly, and at varying strengths. This would have caused the yacht's course to swing through nearly 360 degrees, and combined with even a relatively modest passage speed of 5 knots would produce a search area of a size that would be impossible to cover.

The RCCNZ Search and Rescue Officers (SAROs) are trained to gather the environmental data (wind/currents) and calculate search areas. This will involve a considerable amount of computation. A computer-based search planning aid, SARMAP, performs these calculations quicker and more accurately than a SARO could do manually, and has access to very accurate near-real time environmental data.

TAFADZWA SARMAP Calculations

Step 1

A datum (point or line) must be selected for the search area. In the case of the TAFADZWA, datum lines were drawn based on the assumed passage that Paul would have taken from Tauranga en route to Gisborne. The drift start time commences at the time of the last known position (Paul's trip report to Maritime Radio), and the datum lines are calculated on an assumed passage speed (5 knots average) and track. The estimated track of TAFADZWA is represented by the three red lines running from Tauranga to Gisborne shown in Figure 2.

Step 2

The type of search object is determined. The yacht TAFADZWA and a life raft were used to compare drift characteristics, but the yacht was used as the search target.

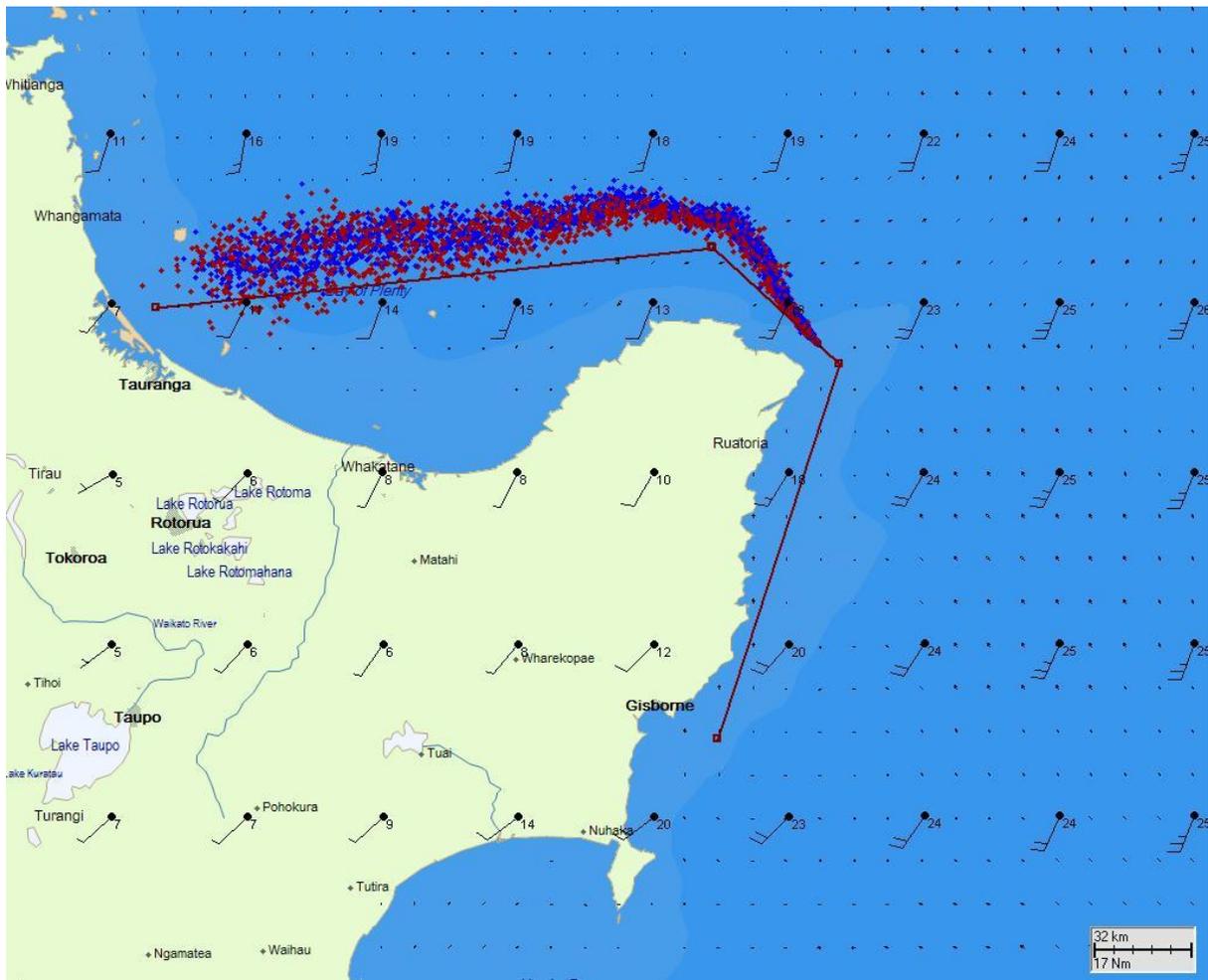


Figure 2 The red line representing the Datum Line for search planning, and the predicted drift pattern after 24 hours

Step 3

The wind direction and speed in the search area is input. SARMAP accesses the Global Forecasting System (GFS), which provides real-time wind direction and speed for any location on the globe. This data is then compared to known local conditions to ensure accuracy.

Step 4

The current data is input. The most accurate on-line data that SARMAP can access is NCOM. This is produced by the US Navy, and is based on satellite synthetic aperture radar sweeps of the ocean surface. The radar can determine near-real time ocean currents globally. Again, this data is assessed against observed local conditions (usually provided by search craft) to ensure accuracy. As with the wind data, if the observed wind and current differs from the SARMAP data, this information can be over-ridden manually.

Once the calculations are complete the model, known as a scenario, is run.

For the TAFADZWA search, particles representing the search object/s were released along the datum lines and allowed to drift with the wind and current. This is known as the Monte Carlo method, and splits each search object into many separate particles. Each particle is assumed to be affected individually by the wind and

current, and the resulting search area produced has proven internationally to be more accurate than the Automated IAMSAR method. This is explained in further detail in the attached SARMAP Info document.

The calculated drift of both the TAFADZWA and a life raft during the first 24 hour period is shown at Figure 2. Note that the water current is represented by the small vector arrows, and the wind direction and speed by the wind arrows. The calculated drift after 4 days is shown at Figure 3.

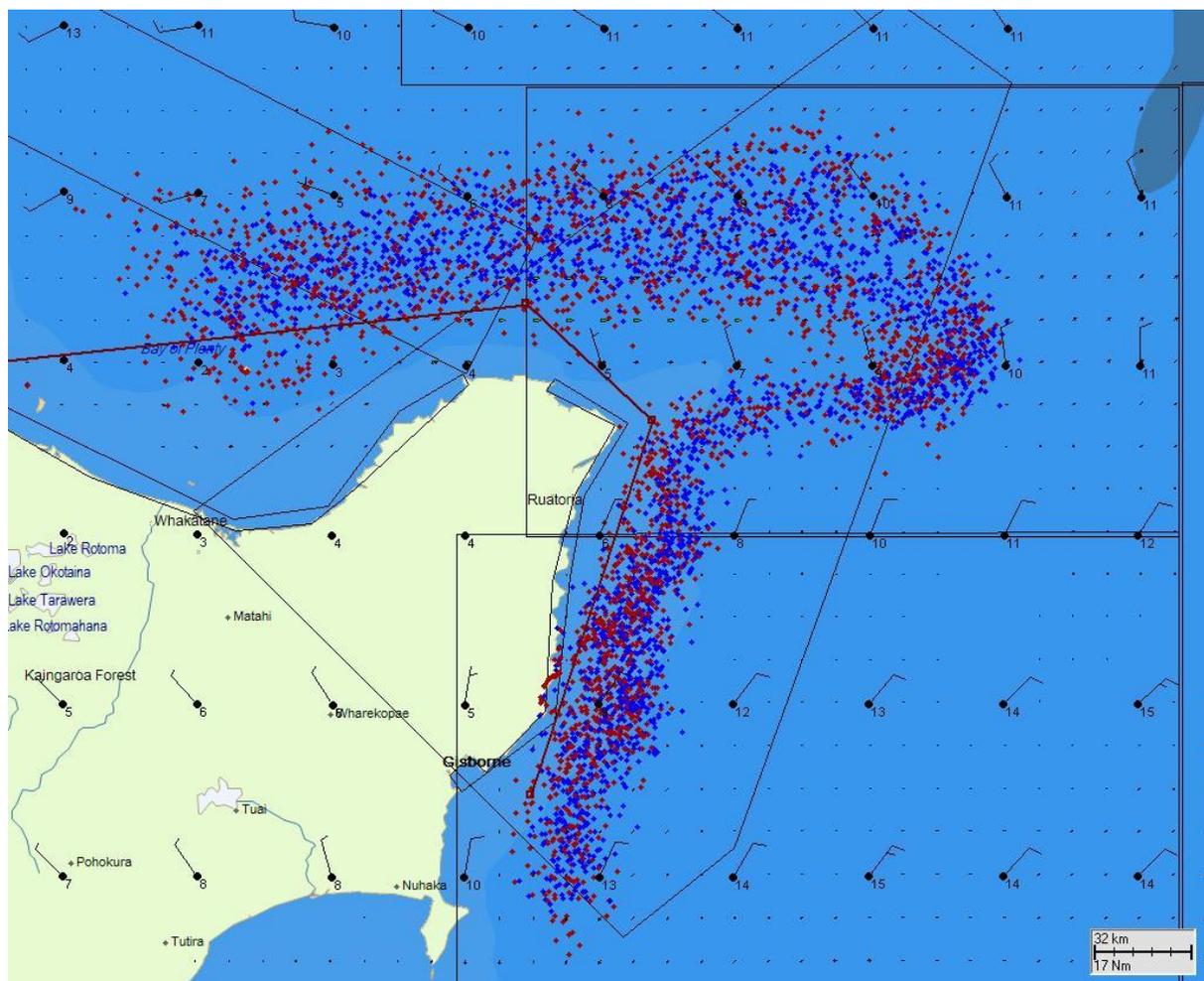


Figure 3 The predicted drift pattern after 96 hours (4 days)

Search Area Coverage (SAC)

Once the search area/s has been produced, the most effective method of searching the area/s needs to be determined. This is based upon the area required to be searched, the number of search craft available and the period of time each can remain searching, the speed at which they will search and the spacing between search tracks. The track spacing is determined by the maximum distance that the search object can be detected from the particular search craft (different for different craft, speeds and altitude). Track spacing wider than the maximum detection distances will increase the possibility that the search target will not be detected. Track spacing narrower than the detection distances provides a high coverage factor, but will either reduce the time that the search craft can remain on scene, or reduce the area that they are able to search.

As well as using this tool to scope the search area, RCCNZ responded to the views of the friends of Paul van Rensberg and the family, and extended the search area beyond the boundaries suggested by the SARMAP process. The areas searched by aircraft tasked by RCCNZ are shown in Figure 1.

Throughout this operation RCCNZ routinely considered the weather and sea conditions. Regular contact was made with the Met Service to monitor and evaluate weather and sea conditions. One of the features of the SARMAP tool is that it automatically utilises in its deductions weather and sea conditions.

Figure 4 shows a smaller scale of the area searched and includes the location where Tafadzwa was found near Chatham Islands. This also shows an area that was suggested for searching by the friends and family. However, as discussed earlier, although requested with RNZAF, this area was not ultimately searched as being too speculative and consuming too many resources with a small chance of success.

In my view the methodology used by RCCNZ was very sound in determining the search area.

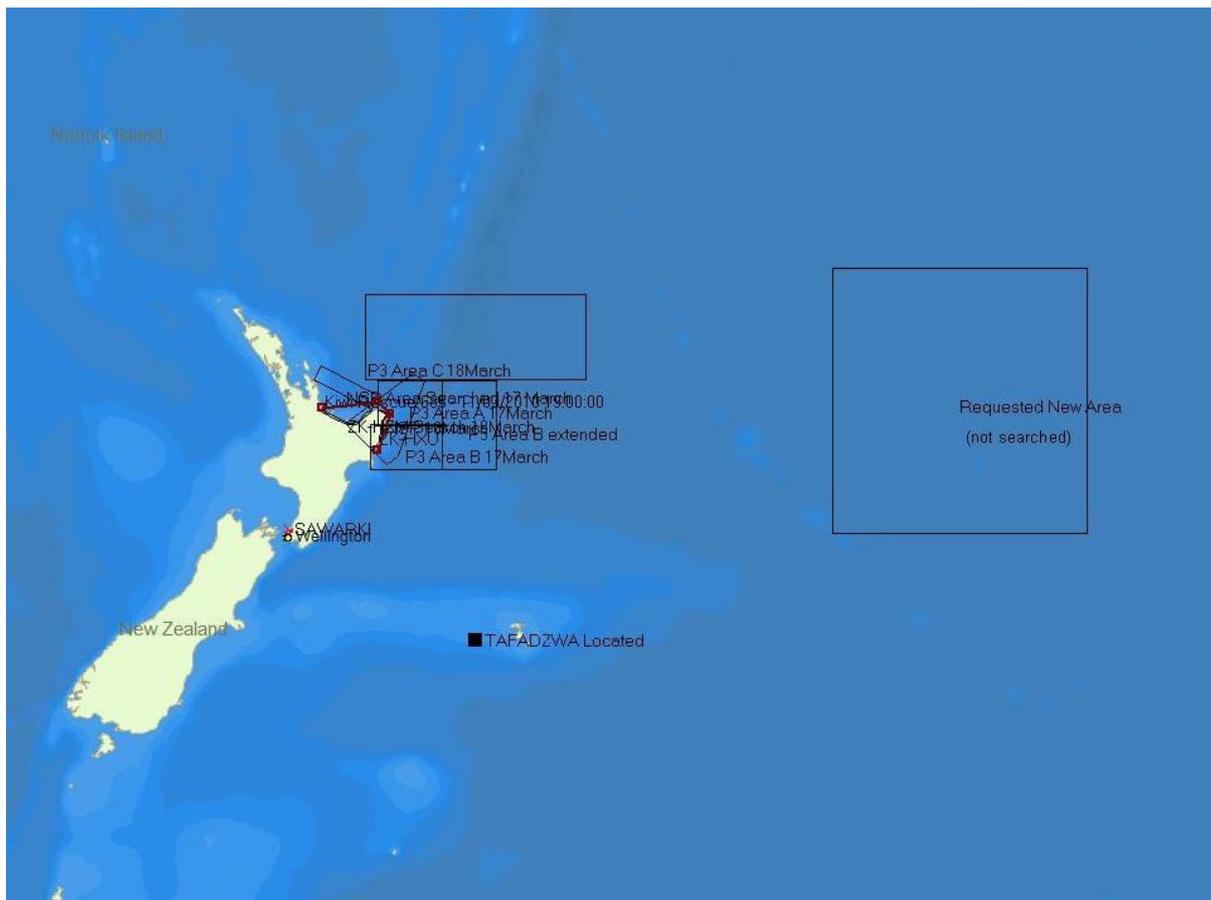


Figure 4 Smaller scale map of the areas searched, the further requested extended search area, and the location of the Tafadzwa near the Chatham Islands

The Australian Maritime Safety Authority generally follows the same process to determine a search area. They use a computer assisted tool that mirrors the functionality of SARMAP, but it also combines an incident/command management

system that they developed themselves – this is known as NEXUS. It was expensive to develop (approx \$A5-6million) and is specific to their use. I am aware that RCCNZ are currently developing systems themselves that could provide incident/command management information as well as a search asset data base.

The Australians informed me that SARMAP, in their view, is still a relevant software system for the purpose used by RCCNZ. Western Australia currently uses it for their development of search parameters.

TOR Point 4 (b) The method and assets used to conduct the search

There were various possible methods to search for the missing vessel.

- Broadcasts to other vessels in the area of search
- Utilising vessels in the area to search for the Tafadzwa
- Aerial search
- Marine experience
- Satellite technology
- Private searching
- Fish Spotters

Broadcasts

Co-located on the same floor as the Operations Centre of the RCCNZ, in Avalon, is the Maritime Operations Centre (MOC). The role of the MOC is to continuously monitor internationally designated call and reply distress frequencies in both the HF and VHF bands for SOLAS (Safety of Life at Sea) responsibilities. The MOC is manned 24 hours a day and is in constant contact with vessels moving about NZ.

The MOC is owned, maintained and operated by Kordia Limited since 1993, and is a turnkey service provided for, and on behalf of, Maritime New Zealand.

Staff members from RCCNZ were constantly in touch with the MOC giving and receiving information.

Vessel searches

Through the MOC, RCCNZ were in contact with vessels in the area of search. I have read the lengthy log generated by the MOC – the dialogue was continuous and there were several instances where other vessels were asked for advice, and to check out potential sightings of Tafadzwa. The MOC was used by the RCCNZ in coordinating the recovery of Tafadzwa when it was located off the Chatham Islands.

Aerial Search

RCCNZ has readily at hand in their Operations Room a folder entitled “SAR Air Operators”. This folder is detailed by region. I have perused this folder. It has details of operator’s assets and their capabilities by region throughout New Zealand. Details recorded for each operator that can be used for SAR purposes includes the type of aircraft available, its equipment with details such as technology devices and ability for medical evacuations. This comprises 99 operators from Kerikeri in the north to Stewart Island in the south of NZ. Several of these operators could provide fixed wing aircraft suitable for off shore search operations. It was from this list that RCCNZ chose operators to search on this operation.

The RNZAF is dealt with separately as they have aircraft of a considerably greater capacity to search off shore and for longer periods of time (P3K Orion). RCCNZ made every effort to use them for this search.

For every incident the RCCNZ appoints a Search Mission Coordinator (SMC). This role is replicated for each shift over a 24 hour period. The SMC leads the action for the search during his shift. As a matter of practice he/she continuously consults with other members on shift, and the Operations Manager regarding initiatives taken on the operation. All this is meticulously recorded in a log which I have been able to review. On this operation one SMC worked for three days of the search to provide some continuity.

The Standard Operating Procedures manual provides a chapter on search planning responsibilities and it seemed to me that these were followed. Once the decision was taken to deploy aircraft for the search, the log discloses that RCCNZ contacted aircraft operators capable for off shore searching. The first operator chosen was not available on Tuesday 16 March and so they contacted another who was able to be deployed that day. The RNZAF was also contacted on Tuesday 16 March 2010.

Once the RNZAF and commercial aircraft operators signified they were available to conduct a search, the appropriate briefing was prepared in the format that is contained in the 'Standard Operating Procedures'. The areas for the planned searches were for the commercial aircraft to search parallel to the coast, out to 180 nautical miles off shore between Gisborne and East Cape. For the RNZAF the search area was for a wider area off shore. These areas are shown in Figure 1.

RCCNZ coordinated a total of 47 hours of aerial searching, which is described in the following table.

AIR ASSETS USED FOR THE TAFADZWA SEARCH

Date	Aircraft	Aircraft type	Time on task
16 March	ZK-NSP	Fixed wing	9hrs 13 mins
17 March	RNZAF Orion	Fixed wing	11hrs 02 mins
18 March	ZK-NSP	Fixed wing	4 hrs 31 mins
18 March	RNZAF Orion	Fixed wing	11 hrs 26 mins
18 March	ZK-HXU	Helicopter	4 hrs 03 mins
18 March	ZK-HZM	Helicopter	2 hrs 45 mins
20 March	ZK-HYP	Helicopter	1 hr 36 mins
20 March	ZK-DCP	Fixed wing	1 hr 54 mins
Total			47 hours

These hours do not include the two hours flying by fixed wing aircraft conducted by Police along the coast north of Gisborne. Nor does it include the aerial flying hours arranged through the family and friends of Paul.

Marine experience

One aspect of any search undertaken by RCCNZ is the experience of the staff undertaking searches. At Appendix Four, I have outlined the brief bios of the Search and Rescue Officers at RCCNZ. Without exception they have skills, backgrounds and experience suited to coordinating searches. This range of experience and skill is used in a collegial way in the execution of searches. They routinely review the progress of searches, and in doing this bring their experience to bear. This is a point often missed by uninformed commentators when discussing the work of RCCNZ. It is hard to see a more qualified group of professionals that could be gathered for search and rescue operations.

Satellite technology

During this operation enquiries were made through the U.S. Coast Guard and the French authorities in the South Pacific, for the potential to apply satellite technology or other new technologies to this search. The family and friends attempted to initiate this aspect of the search. During an interaction with an expert from the French they summarised this technology as follows.

“Technically speaking, SAR (synthetic aperture radar) satellite is able to detect metallic objects down to 8 – 10 mile, but with a swath of 100km. That means we are not facing a capacity to cover more than 10,000sq km per image.

- *Regarding the chance to detect a raft even with high resolution optical sensor, it is really too low (that can even be smaller than a wave break).*
- *It is possible to acquire several scenes on a band of 100 km width, that is interesting if you have a clear idea in Longitude and not in Latitude (as the satellite pass is around 12 degree inclination from Earth Axis).*
- *Then, what you require is an Urgent tasking plan, that has to be programmed as soon as possible pass of the satellite and the estimation of the position thanks to the hour of acquisition.*
- *Finally, downloading the data from the onboard memory of the satellite and processing of the image will take hours.*

Without a better estimation of the location day by day, satellite programming will be non useful.

But I really have to admit that your request is at the time being, very difficult to answer with Earth Observation satellite with a so uncertain location on so large area to be covered.”

The same adviser in another message commented that *“French Navy like many others all over the world is just beginning in using satellite imagery for their needs, particularly SAR activities.”*

When RCCNZ sought similar information from the U.S. Coast Guard, they were unable to provide satellite imagery or tracking and indicated their information in this regard in very limited at this time.

In this search the family initiated the search effort for satellite and possibilities from the U.S. and the French military. In their submission to the Review they recommended that RCCNZ explore what facilities such agencies can provide for SAR work. That is a reasonable suggestion on their part.

RCCNZ is keen to learn of new technologies of this nature, and in this regard whilst it is not a military organisation with secure communications, it does have a direct liaison with the NZDF (and through the SAR Council) so can learn of new developments that come to the notice of the NZDF.

RCCNZ is a member of The International Maritime Organisation – subcommittee on communications and search and rescue (COMSAR). This subcommittee meets regularly, and technology of this nature is monitored for SAR applications.

It is recommended that the RCCNZ continue to seek the application of new technology for use in SAR.

Private searching

In this case friends of Paul gathered and endeavoured to assist in the search. They created a website “Let’s find Paul”, made enquiries, and raised money for aerial searches. After the official search was suspended, they organised seven flights (including one helicopter) in areas they thought were possible locations of Paul. They paid for some themselves, but raised money to pay for the remainder of the flights.

They felt frustrated that this search was not integrated with searching organised by RCCNZ. They were also frustrated that they weren’t informed of the finding of the ‘Tafadzwa’, as subsequent to the finding they had paid for an additional aerial search. They felt if their search effort was coordinated with the RCCNZ then they would not have wasted money on this last flight.

There was a feeling that their efforts were not taken seriously by RCCNZ. It did not help their cause that during their searching they grew a little distant from the next of kin. This no doubt affected their ability to obtain up to date information from RCCNZ.

It seems to me that private searching by friends and family is a common feature in searches for missing persons. They are emotionally and intimately involved and will seek to gather as much information and search as widely as possible. These efforts of family and friends may appear to the professionals to be beyond the capability of systems or technology or well beyond the search area of RCCNZ analysis. Nevertheless, RCCNZ should endeavour to keep in touch with a private enquiry and search. The private search could assist the official search, and liaison, at least, could minimise later criticism that the officials had ‘not done enough’. A designated liaison officer with this private search would be helpful.

Recommendation:

That RCCNZ maintain effective liaison with private searches when these are instituted for missing vessels.

Fish Spotters

Through the friends of Paul, I contacted a 'fish spotter'. There are at least 5 of these operating around the coast of New Zealand. They are pilots flying for key fishing companies to locate fish. They operate as single pilots flying at around 1,000 feet (or can go lower) out to about 50 miles off shore. I was told many of them have substantial flying hours in this role. The pilot I spoke to flies his Cessna 172 (ZK DEX) about 1,000 to 1,200 hours annually. He says all fish spotters are very experienced at searching for objects off shore. His four seater Cessna has portable life rafts, and a 406 beacon attached to a life jacket (as well as an ELT in the aircraft). They monitor the marine radio, as well as other channels, and would be well suited to searches for missing vessels off shore.

The pilot expressed frustration that he and his colleagues are not contacted in searches that they could assist with. He said that he was flying in the area at the time that the Tafadzwa went missing, but was unaware of this. Whilst he monitors marine radio he can be distracted by other radio channels, and the best method of contact is through the cell phone.

Recommendation:

That RCCNZ contact professional pilots operating as fish spotters, and determine their capability and availability for off shore searches.

TOR Point 4 (c) Suspension

Section 8 of the RCCNZ Operations Manual contains comprehensive guidance and instructions for the termination or suspension of searches.

The RCCNZ Operating Procedures relating to Incident Termination and Suspension of searches are attached at Appendix Three.

The authority for search suspension in this operation lies with the Director of Maritime New Zealand. She suspended the search on the evening of Thursday 18 March 2010.

Prior to search suspension, consideration is to be given to the probability of survivors, prospects of success, and that the area has been exhaustively searched. In this case the RCCNZ stated in their summary to the Director of Maritime NZ the following in support of their recommendation.

"Extensive coastal and oceanic searches by aircraft on Tuesday 16, Wednesday 17 and Thursday 18 March have failed to locate any sign of the missing yacht despite searching areas well in excess of the computer predicted drift of a disabled yacht. The area searched is in excess of 50,000 square nautical miles.

The yacht is equipped with a 406 EPIRB that has not been activated, which indicates a number of possibilities, including:

- (1) The yacht has sunk quickly.*
- (2) The sole male occupant has been totally incapacitated.*
- (3) The sole male occupant has been lost overboard.*

(4) If incapacitated to the extent that he cannot use the beacon then survival time is likely to have been exceeded due to a combination of shock and dehydration.

(5) If the yacht is still afloat but not under command it could have sailed beyond the search area.

The water temperature of 20 degrees Celsius indicates a survival time, for a person in the water, of about 12 hours, based on the assumption that a cold water survival suit was not being worn. Nearly 150 hours have elapsed since the skipper last made contact with his partner, early in the voyage.

It is considered that further searching of the areas developed so far is unlikely to be successful. It is also not possible to predict a realistic search area for the yacht if it is not under command but is sailing.

It is therefore recommended that the search for the yacht TAFADZWA and its sole occupant be suspended.”

It is my view that this summary, along with my review of the enquiries made and the searches carried out, fully justify the decision to suspend the search that was made at the time.

Whilst technically the requirements of the Manual were complied with, there has been comment from the family and friends of Paul van Rensberg that the search was suspended prematurely.

Their concern that the search was suspended prematurely was based around the search being only a few days old, and that they believed the yacht could have been damaged and still afloat. Their analysis of the wind conditions meant Paul could be drifting to the north, and they suggested a wider targeted search area.

On a website established by friends of Paul Janse van Rensberg - “Let’s find Paul” - there is a comment that ‘all the authorities have given up on finding Paul’.

The decision to ‘suspend’ can be taken as a termination of all action to find the missing yacht. But, in fact, enquiries and broadcasts continued in this case. The ‘suspend’ decision was just that – a suspension. Should further information or evidence become available then reconsideration would be made to resume the search. RCCNZ did make an assessment of the further analysis provided by the family and friends, and went to the extent of consulting the RNZAF, but as they stated:

“The prospects of success are very low in such a large search area and the additional transit hours to/from a distant search area would limit on-station hours per day. The task would require a sustained commitment over many days (well over a week) to complete, and the area of uncertainty would continue to increase. A lengthy task of this nature would likely consume all available crew resources at 5 Squadron and therefore constrain the NZDF’s ability to respond to any new more urgent SAR.”

Whilst I find the guidance and instructions contained in the RCCNZ Operations Manual to be comprehensive and sufficient for its purpose, the Manual could reflect

that further enquiries will likely continue, so that it is not portrayed to next of kin that the 'authorities have given up', when a suspension decision is made.

In relation to this, RCCNZ have suggested the following amendment to their Manual.

“Important note: “Suspension” of a search operation means that directed tasking of sea, air and land resources, as applicable, has ceased. The operation remains open and RCCNZ (the Coordinating Authority in Category II SAR operations) will continue to actively seek information to inform the search operation. Any new information will be evaluated, and may result in further directed tasking to search new areas, or areas already covered; in such cases the suspension has been lifted.

Should the subsequent directed tasking action being undertaken be unsuccessful in bringing the SAR event to a conclusion a further suspension process will be followed.”

I agree with this amendment.

TOR Point 4 (d) Family liaison and support arrangements.

Paul Janse Van Rensberg, the missing sole sailor was a South African national. His parents live in South Africa, and he had a partner living in New Zealand. The partner was in touch with the Police and RCCNZ from the outset of this search. Within 24 hours of the commencement of the log, RCCNZ had made contact his parents in South Africa.

The log of events discloses that regular updates were given to his partner, and once email contact was made with his parents, they were routinely updated on the progress of the search. This RCCNZ contact over the first few days was made by the Search and Rescue Officers (SARO) in the Operations Room, however once the search had been suspended, this contact with next of kin became the responsibility of the RCCNZ Operations Manager.

Paul's partner was happy with the contact and updates she had with RCCNZ, except she felt that when she was advised of the suspension of the search that she was left with the impression that it was a search termination. She understood later that further work was done in the effort to locate the Tafadzwa. However, the point as earlier indicated in this Review is that care needs to be taken in conveying this information about search suspensions.

Paul's parents in a written submission to the Review made the following comment:

“From the time that I first contacted RCCNZ, they went out of their way to keep, not only Angela and myself, but also my youngest son Gerald and his older sister, Bridget in Sedona, Arizona fully informed on all aspects of the search, and treated all our communications, suggestions and requests, with the utmost courtesy, respect and sympathy.

The one constructive comment that I would like to make is as follows:

Instead of informing us right from the outset what the lines of communication with RCCNZ should be, they allowed us to continue communicating with control room staff, as well as what subsequently turned out to be managers, before advising us that we should communicate directly through one person. It would have been helpful if from the outset, if we were advised of the Management structure, and the person within that structure that we should have been communicating with.”

The ‘constructive comment’ made in the submission is well made and should be adopted by the RCCNZ, and I accordingly make this recommendation.

In part this comment was informally adopted by the RCCNZ. Initially the various Search and Rescue Officers on duty at the time dealt with the family. Once the search was suspended the Operations Manager principally took over this role. I agree with the family that until this point it may have been difficult to develop a relationship with RCCNZ by speaking to multiple officers.

As discussed earlier in the Review, I have suggested that the Manual does not emphasise the importance of maintaining good relationships with the next of kin and have put the comment of the family to RCCNZ. They have responded with the following draft amendment to their Manual which includes the suggestion made by Paul’s parents.

Background

Para 6.6.2.1 of the Manual addresses the need to keep the PLO informed while para 6.6.2.2 addresses access by relatives to RCCNZ’s operations room. In practice, relatives and friends contact RCCNZ direct to obtain, or pass on, information.

Conversely, it is often appropriate for RCCNZ’s SAROs or management to contact relatives direct. Relatives and friends prefer to deal with a single point of contact in RCCNZ for this purpose, which may not be possible because of rostering and staff duty periods. Decisions on who should contact relatives are generally driven by circumstance, and RCCNZ staff must use their judgement to decide which course to take. RCCNZ’s SOPs should provide guidance on this aspect.

Proposed amendment

6.6.2.1

Text remains unaltered.

New text for Para 6.6.2.2

In practice, relatives (and friends) often contact RCCNZ direct to obtain, or pass on, information. Conversely, it is often appropriate for RCCNZ’s management or SAROs to contact relatives direct. While it is preferable for there to be a single point of contact in RCCNZ for this important function, decisions on who should contact relatives are generally driven by circumstance and RCCNZ staff must use their judgement to decide which course to take. RCCNZ management will inform the duty SAROs if contact is made between relatives and management and SAROs must inform the RCCNZ management when direct contact with relatives occurs. The PLO shall also be informed on these occasions.”

I agree with this amendment.

TOR point 5: To make recommendations as appropriate to the New Zealand Search and Rescue Council

I found that the RCCNZ did follow their arrangements and procedures. I make the following recommendations to the New Zealand Search and Rescue Council.

- 1) That RCCNZ maintain effective liaison with private searches when these are instituted for missing vessels.
- 2) That RCCNZ contact professional pilots operating as fish spotters, and determine their capability and availability for off shore searches.
- 3) In respect to search 'suspensions' the RCCNZ include in their 'Standard Operating Procedures' the following:
 - *"Important note: "Suspension" of a search operation means that directed tasking of sea, air and land resources, as applicable, has ceased. The operation remains open and RCCNZ (the Coordinating Authority in Category II SAR operations) will continue to actively seek information to inform the search operation. Any new information will be evaluated, and may result in further directed tasking to search new areas, or areas already covered; in such cases the suspension has been lifted.*
 - *Should the subsequent directed tasking action being undertaken be unsuccessful in bringing the SAR event to a conclusion a further suspension process will be followed."*
- 4) In respect to dealing with next of kin the RCCNZ should include in their 'Standard Operating Procedures' the following
 - *In practice, relatives (and friends) often contact RCCNZ direct to obtain, or pass on, information. Conversely, it is often appropriate for RCCNZ's management or SAROs to contact relatives direct. While It is preferable for there to be a single point of contact in RCCNZ for this important function, decisions on who should contact relatives are generally driven by circumstance and RCCNZ staff must use their judgement to decide which course to take. RCCNZ management will inform the duty SAROs if contact is made between relatives and management and SAROs must inform the RCCNZ management when direct contact with relatives occurs. The PLO shall also be informed on these occasions."*
- 5) It is recommended that the RCCNZ continue to seek the application of new technology for use in SAR.

TERMS OF REFERENCE

1. To gain an understanding of the sequence, times of events and key decisions relating to the search and rescue operation (SAROP) in relation to the yacht TAFADZWA.
2. To ascertain whether the current search and rescue arrangements and procedures were followed by the Rescue Coordination Centre New Zealand (RCCNZ).
3. To ascertain whether the current search and rescue arrangements and procedures utilised are appropriate for an incident of this nature.
4. In particular to review the following specific aspects of the RCCNZ coordination of the SAROP and consider the appropriateness of:
 - a. The processes, procedures and decisions made to determine the positions and sizes of areas to be searched given the information available at the time.
 - b. The process, procedures and decisions made relating to the method and assets to be used to conduct the physical searching of the calculated search areas given the information available at the time.
 - c. The process, procedures and decisions made relating to the formal suspension of the SAROP given the information available at the time.
 - d. Family liaison and support arrangements.
5. To make recommendations as appropriate to the New Zealand Search and Rescue Council.

INTERVIEW SCHEDULE

Maritime New Zealand

Cath Taylor – Director

Police

Inspector Gerry Prins – Police National Headquarters

Detective Sergeant Wayne Beattie – Gisborne (telephone)

RCCNZ

Nigel Clifford – General Manager Safety Services

John Seward – Operations Manager

Keith Allen – Search and Rescue Officer

Neville Blakemore – Search and Rescue Officer

Dave Wilson – Search and Rescue Officer

Andrew Tarr – IT Support and Systems Development Officer

Other Search and Rescue officer in the operations room who explained various manuals and software development

Australian Maritime Safety Authority

Alan Lloyd – Operations Manager, Australian RCC

Friends of the family

Regan Boocock – Tauranga (telephone)

Pilot - Fish Spotter

Brian Decke, Tauranga – pilot for Sandfords Fisheries

Next of Kin

Kristen Duirs – Partner – Ohakune (Telephone)

Martin Janse van Rensburg – father – South Africa (telephone)

SUSPENSION OF SEARCH CRITERIA

Extract from RCCNZ Standard Operating Procedures

8. Incident Termination or Suspension

8.1 SAR Action Not Successfully Concluded

8.1.1 Consultation

8.1.1.1 A SAR search should continue until the possibility of success is no longer reasonable and all hope of rescuing survivors is past. If, after consultation with the OSC and/or others involved it has been determined that a further search would be to no avail, the SMC must consult the RCCNZ Duty Manager before commencing procedures to terminate or suspend a search.

8.1.2 Search Termination Considerations

8.1.2.1 As the search progresses it may be necessary to re-evaluate scenarios and redefine the search area. Plots of search sub-areas covered should be maintained so that a progressive record of the search is built up. Before terminating or suspending search activities the SMC should review the following factors in consultation with RCCNZ Duty Manager:

- (a) There is no longer any probability that survivors might still be alive, given temperature, probable employment of life saving appliances, wind and sea conditions prevailing since the distress incident;
- (b) The cumulative Probability of Success;
- (c) The probability that survivors were in the search area and that the area has been exhaustively searched, or that it is no longer possible to continue;
- (d) That all probable locations have been investigated and enquiries as to the whereabouts of the vessel or craft have been exhausted; and
- (e) The availability of search facilities to continue the search.

8.1.3 Search Termination

8.1.3.1 When the efforts to locate the distressed aircraft or vessel and their occupants have been successful and the survivors, if any, have been rescued, the SMC shall terminate the search. This action will be followed by notifying all participating organisations, persons and rescue units/elements that the search activities are terminated and confirming that all rescue or survival equipment has been recovered or removed from the scene when possible. Appropriate documentation shall be completed.

8.1.4 The Decision to Suspend the Search

8.1.4.1 The difficult decision to suspend active search operations pending the receipt of additional information must be taken at some stage. Prior to suspending such search operations a thorough case review should be made. The SMC must decide that additional search effort will not result in success. In making this decision each SAR incident must be considered on its own merits and care should be taken not to end the search prematurely.

8.1.5 SAR Case Review

8.1.5.1 The decision to suspend a search involves humanitarian considerations, but there is a limit to the time and effort that can be devoted to each SAR case. The reasons for suspending a search should be clearly recorded. A case review of the incident leading to the decision should examine:

- (a) Search decisions for proper assumptions and reasonable planning scenarios;
- (b) Certainty of initial position and any drift factors or anomalies used in determining the search area;
- (c) Significant clues and leads re-evaluated;
- (d) Data computations;
- (e) The search plan to ensure that:
 - i. All assigned areas were searched;
 - ii. The Probability of Detection is as high as realistically achievable; and
 - iii. Compensation was made for search degradation caused by weather, navigational, mechanical or other difficulties;
- (f) The determination about the survivability of survivors, considering:
 - i. Time elapsed since the incident;
 - ii. Environmental conditions; and
 - iii. Age, experience, physical condition of potential survivors, the likely will to survive;
 - iv. Survival equipment available; and
 - v. Studies or information relating to survival in similar situations.

8.1.6 Search Suspension

8.1.6.1 When the efforts to locate the distressed aircraft or vessel and their occupants have been unsuccessful and the RCCNZ team is unanimous that further search, without fresh evidence, will be to no avail, the SMC shall initiate search suspension procedures. This shall include a comprehensive review of the operation, using the Mission Suspension Class III SAR Mission Checklist at **Annex P01-8A** to cover:

- (a) Search decisions to ensure appropriate assumptions were made and that planning scenarios were reasonable;
- (b) Certainty of initial position and drift factors used in determining the search area should be re-examined and significant clues and leads should be re-evaluated;
- (c) Datum computations;
- (d) The search plan should be reviewed to ensure that:
 - i. all assigned areas were searched;
 - ii. the probability that the search effort would have located the survivors; and
 - iii. compensation was made for search degradation caused by weather, navigational or other difficulties.
- (e) A determination of the survivability of potential casualties should be made, considering:
 - i. time elapsed since the distress;
 - ii. environmental conditions;
 - iii. age, experience, clothing and physical condition of occupants;
 - iv. survival equipment available;
 - v. immersion tables and other studies or information relating to survival in similar situations; and

- vi. the reasons for suspension shall be clearly recorded and signed off by the SMC and the Suspending Authority.

8.1.6.2 Following this review procedure the SMC shall advise the RCCNZ Duty Manager of the decision to recommend search suspension and request approval from the appropriate Suspending Authority. The completed Mission Suspension Checklist Form (**Annex P01-8A**) should be printed and either emailed or faxed to the Suspending Authority together with copies of relevant Media releases if practicable. The SMC shall also provide a comprehensive verbal briefing of the reasons for seeking approval to suspend operations and answer any questions that may be raised. Upon receipt of the faxed, or emailed confirmation of approval from the Suspending Authority, all participating organisations, persons, and SRUs shall be notified and the Media staff should issue a final media release. Note a verbal approval is not an acceptable authority to proceed unless this whole process has been recorded on the RCCNZ Operations Room voice recording system. Written confirmation is to follow at the first opportunity.

8.1.6.3 During the period of search suspension the RCCNZ Duty Manager shall evaluate any additional pertinent information in consultation with the SMC. Should a continuation of the search be contemplated, the Suspending Authority shall be fully briefed by the RCCNZ Duty Manager on the circumstances, reasons for resumption and the extent of the renewed operations proposed. Upon agreement by the Suspending Authority, the SMC shall reactivate the search.

8.1.7 Reopening A Suspended Incident

8.1.7.1 If significant new information or “clues” are developed, reopening a suspended incident should be considered. Reopening without good reason may lead to unwarranted use of resources, risk of injury to searchers, possible inability to attend to other emergencies, and false hopes among relatives.

8.1.8 Suspending Authorities

8.1.8.1 Suspending authorities for Category II SAR operations are:

Missing civil aircraft

- Director or Deputy Director of Civil Aviation

Missing military aircraft and missing naval vessels or personnel

- Chief of Defence Force who may delegate authority to the ACAS (Ops) or CNS (Chief, Naval Operations Requirements and Plans), as appropriate

Missing marine vessels

- Director of Maritime New Zealand or Acting Director of Maritime New Zealand.

8.1.9 Ministerial Advice

8.1.9.1

8.1.10 Next of Kin

8.1.10.1 Before a Class III SAR operation is suspended, the SMC, through the Police Liaison Officer, shall consult the next of kin when possible and brief them on the

search effort, conditions in the search area and the reasons for proposing suspension.

8.1.11 Notification of the Decision to Suspend a Search

8.1.11.1 In a protracted incident, notification of the decision should normally be made **one day prior** to the suspension of operations, allowing relatives at least one more day of hope, while giving them time to accept that the search cannot continue indefinitely.

8.1.12.2 Clearly, this amount of notice will not always be appropriate, but the significance of providing relatives with some notice of the intention to suspend the search should be taken into account.

8.2 Dealing with Relatives

8.2.1 Briefing Relatives During a Search

8.2.1.1 The SMC/PLO should advise the relatives and/or Next of Kin (NoK) of missing persons that the search has been suspended. Relatives and NoK are normally more willing to accept the decision to suspend operations if they have been allowed to follow the progress of the search. The SMC should maintain contact with relatives during the search to provide information and outline RCCNZ's plans.

8.2.2 Providing Access to Coordination Centres

8.2.2.1 Providing access to the coordination centre during a search is discouraged. When terminating or suspending a search it may be appropriate to enable relatives and/or NoK to see the RCCNZ Operations Room and be shown the Search Plans. These steps may assist relatives and NoK in accepting the SMC's decision to conclude search operations in the event that missing persons are not located.

RCCNZ STAFF BACKGROUNDS

- a) A former air combat pilot and commanding officer with 27 years experience in the Royal Air Force and the RNZAF. Has an Honours degree in Law and a Masters in Defence Studies. Extensive experience in leadership, personnel management, training systems, project management, and developing and maintaining strong internal and inter-agency relationships. Focused on continual development in the SAR sector and improvements to internal and external processes to improve SAR capabilities in New Zealand's area of SAR responsibility. Two and a half years with RCCNZ during which time he has had oversight and overall responsibility of a wide range of incidents in the sea, air and land environments. Responsibilities have been recently extended to cover all of Maritime New Zealand's safety services.
- b) A former air force navigator with 25 years of experience in aviation search and rescue before joining Civil Aviation Authority where duties included 16 years managing New Zealand's National Rescue Coordination Centre. Previous operational and management roles covering air transport flight operations, aircrew training, financial and human resources management, joint exercise planning, intelligence, inter-departmental, inter-agency and inter-government liaison and co-ordination. Six years with RCCNZ as Training Manager.
- c) A former police officer who had 21 years in sole charge of a country area with typical mountainous features and an extensive, rugged coastline. Extensive experience in aviation, land and coastal marine SAR. A former member of NZ's Coastguard who established the local marine VHF network. A Civil Aviation Authority approved crew member for police helicopter operations. Six years experience in RCCNZ.
- d) A former ship's master and marine pilot (UK) with extensive international experience who spent three years as a NZ based marine accident investigator. A yacht owner and experienced yachtsman. Tutors yacht master courses. Six years experience with RCCNZ.
- e) A UK trained air traffic controller who has worked in that role in the UK and NZ. Six years experience with RCCNZ and now also a subject specialist in Business Continuity Management.
- f) A former air force Air Electronics Operator who has brought 20 years knowledge of P3K Orion search and rescue operations and techniques to the RCCNZ. Also experienced in course development, management and delivery. Completing tertiary studies in Business Management. Six years experience with RCCNZ.
- g) A former member of the air force's medical branch who had considerable experience in SAR during his 20 years service. Worked as a manager in the boat building industry. A long time member of NZ's Coastguard (management)

and an active recreational pilot (aviation) and part owner of an aircraft. Six years experience with RCCNZ.

- h) A former member of the Royal Navy's submarine service who subsequently served for 20 years with the UK Maritime and Coastguard Agency as a Search and Rescue Officer (SARO) and Search and Rescue Mission Coordinator (SMC). Six years experience with RCCNZ.
- i) A former employee of CAA, subsequently a businessman (electronics) and a long time member of the NZ Coastguard (including operations and management). Has extensive experience in marine SAR, plus some aviation and LandSAR experience. Joint instigator of NZ Coastguard's Air Patrol. Six years experience with RCCNZ.
- j) A former police officer with experience in managing SAR events. Subsequently managed a division of a government agency. A member of LandSAR and a recreational yatchie. Four years experience with RCCNZ.
- k) A former Australian air force radio operator who subsequently served for nine years as an operator in the Maritime Operations Centre (MOC), NZ's maritime Distress and Safety radio service. As a Senior Operator, brought a wealth of experience as a result of handling the full range of maritime events, including communications with distressed vessels, to the RCCNZ team. Subject specialist on SAR in the Antarctica. Six years experience with RCCNZ.
- l) A former commercial mariner with extensive experience in New Zealand's maritime region. First Mate qualified. Four years experience with RCCNZ.
- m) A former marine radio operator, Global Marine Distress and Safety System (GMDSS) qualified, with six years experience in the Maritime Operations Centre (MOC). Previous experience in the same role in South Africa's equivalent of MOC. Nearly four years experience with RCCNZ.
- n) A former member of the Australian Army (20 years) with extensive leadership and personnel management experience. Well versed in survival techniques in rough terrain and has considerable experience in land search and rescue. Also an accomplished businessman, based in Wellington. 18 months experience with RCCNZ.
- o) An experienced mariner who has served with the Royal New Zealand Naval Volunteer Reserve (23 years) and is a member of the NZ Coastguard and recreational boatie. Prior to joining RCCNZ, employed in a number of roles in Human Resources and other business units of Government Departments and private industry. 18 months experience with RCCNZ.
- p) A former marine radio operator, GMDSS qualified, with three years experience as an operator in the Maritime Operations Centre (MOC).. Has worked in the aviation agriculture sector overseas. 18 months with RCCNZ.

- q) A former member of the NZ Coastguard for seven years, including time as a training officer. Extensive IT background adds value to RCCNZ in regard to systems development and maintenance. A recreational yachtsman. Four years with RCCNZ.

- r) A former air force officer with extensive experience of aviation and marine SAR operations in NZ's SRR and overseas, plus management of aviation and marine resources in SAR incidents. Search and Rescue Mission Coordinator with the National Rescue Coordination Centre (NRCC), public relations with NRCC and New Zealand Defence Force. Previous operational and management roles covering air transport and air combat flight operations, aircrew training, aircrew and aircraft scheduling, financial and human resources management, joint exercise planning, intelligence, technology, inter-departmental, inter-agency and inter-government liaison and co-ordination, administration and technical disciplines. Commercial pilot qualified. Six years with RCCNZ as Operations Manager.

COORDINATION OF SEARCH AND RESCUE ACTIVITIES

Definitions

The following definitions have been agreed for search and rescue activities within New Zealand's search and rescue region:

- **Coordinating Authority.** The Coordinating Authority is the agency or body responsible for the overall conduct of the Search and Rescue Operation. The Coordinating Authority will lead and manage the operation. The New Zealand Police and the Rescue Coordination Centre New Zealand are the recognised Coordinating Authorities in New Zealand.
- **Search and Rescue Operation.** A Search and Rescue Operation (SAROP) is an operation undertaken by a Coordinating Authority to locate and retrieve persons missing or in distress. The intention of the operation is to save lives, prevent or minimise injuries and remove persons from situations of peril by locating the persons, providing for initial medical care or other needs and then delivering them to a place of safety.
- **Body Recovery.** New Zealand Police have the legal responsibility for all body recovery activities in accordance with the Coroners Act 2006. During a Category I SAROP New Zealand Police is the Coordinating Authority and will handle body recovery as part of the SAROP. During a Category II SAROP the Rescue Coordination Centre New Zealand is the Coordinating Authority and will manage all SAROP activity but, where practicable, will defer all matters relating to any subsequent body recovery activity to New Zealand Police.
- **Category I SAROP.** A SAROP coordinated at the local level; including land operations, subterranean operations, river, lake and inland waterway operations and close-to-shore⁷ marine operations⁸.
- **Category II SAROP.** A SAROP coordinated at the national level; including, operations associated with missing aircraft or aircraft in distress and off-shore marine operations within the New Zealand Search and Rescue Region⁹.

⁷ The nature of 'close-to-shore' will vary according to the availability of local resources and the need to task national assets. Typically such operations will be within NZ Territorial Waters (12 nautical miles).

⁸ Category I SAROPs typically require the use of local personnel and resources and can be carried out efficiently and effectively at the local level.

⁹ Category II SAROPs typically require the use of national or international resources and may involve coordination with other States.

Responsibilities

For any SAROP there can only be one Coordinating Authority who is responsible for the management and coordination of the operation. The current responsibilities are as follows:

- New Zealand Police are the Coordinating Authority for all Category I SAROPs.
- The Rescue Coordination Centre New Zealand is the Coordinating Authority for all Category II SAROPs.

Transfer of Responsibility

With the agreement of both Coordinating Authorities any SAROP may be re-categorised at any time and responsibility passed in either direction.¹⁰

Responsibility for the SAROP must be formally transferred in accordance with established Standard Operating Procedures.

Initial Actions

The Coordinating Authority to receive initial notification of an incident that may require a SAROP will undertake the initial classification of the SAROP and assume responsibility until any formal transfer required is agreed.

Information Exchange

Established protocols provide for information to be exchanged between New Zealand Police and the Rescue Coordination Centre New Zealand to ensure close cooperation, effective communication and appropriate response.

SAROP Conclusion and Suspension

Coordinating authorities will conclude or suspend a SAROP in accordance with established protocols. Where responsibility has been transferred between authorities, the initiating authority will be advised that the SAROP has been concluded or suspended.

Cost of SAROP

The cost of a SAROP is met by the respective Coordinating Authority. Where a SAROP is transferred between Coordinating Authorities, the responsibility for meeting costs also transfers from the point onward.

Statistics

The Coordinating Authority who possesses coordinating responsibility at the conclusion or suspension of a SAROP is responsible for all statistical reporting in relation to the SAROP.

¹⁰ Typically such re-categorisation would happen no more than once in any SAR operation.

ABOUT SARMAP

SARMAP is a GIS-based search and rescue model used to predict the path of different floating objects in marine or fresh waters. SARMAP includes the ability to deploy search and rescue units (SRUs), set their search patterns, and calculate the probability of containment (POC), probability of detection (POD), and probability of success (POS). The SARMAP model may also be run in **Backtrack** mode.

SARMAP drift calculations are determined using either of two methods:

- **Automated Manual Solution (AMS)**, from the International Aeronautical and Maritime Search & Rescue Manual (IAMSAR), IMO, 1999.
- **Monte Carlo** or Particle Method

The Monte Carlo solution allows for more flexibility and in general is believed to provide a smaller and more accurate search area. The Monte Carlo solution allows for:

- Multiple search objects (often referred to as targets) in a single simulation
- Initialization based on single point Last Known Position (LKP) or track line
- Probability cells
- Probability of Containment (POC) based on probability

The AMS solution is limited to single point Last Known Position initialization, but does allow multiple search objects in a scenario.

Several integrated components comprise the SARMAP model system. The model itself predicts the movement of various floating objects (sailboat, raft, surfboard, etc.) on the water surface. For these calculations, the model relies on environmental data such as wind and currents, physical data such as the proximity of shorelines, and the drift characteristics of the floating object in question. Each of these types of data can be input and edited using the appropriate SARMAP component.

Scenarios are the means of organizing model data and parameters into unique collections. A scenario in SARMAP is a collection of information that defines a model simulation. This information includes a definition of the search and rescue scenario (date, location, type of missing object, etc.), the environmental data files (land-water boundary, winds and currents) used in the simulation, and the search and rescue units deployed, all saved under a unique scenario name. Any of the data files that comprise a scenario may belong to a single scenario or to many scenarios.

Before a model simulation is run, a scenario is only the set of input forms defining the input data. After the execution of a model simulation, a scenario also has model output (search object's predicted trajectory and search area) associated with it. Thus, the term scenario describes both the inputs and the outputs of a model simulation. There is always one active scenario. The active scenario name is displayed at the top of the screen, and the components of the scenario can be viewed in the map window.

SARMAP also includes an embedded Geographic Information System (GIS). The GIS is used to store, display and analyze any type of geographically referenced data. Types of data often included in the GIS are place names and navigational aids. These data are not necessarily used by the model, but they are often helpful in analyzing and interpreting model results. SRUs are included as a special type of GIS object which can be deployed in various search patterns with different operating constraints to determine the probability of success of a given search.

