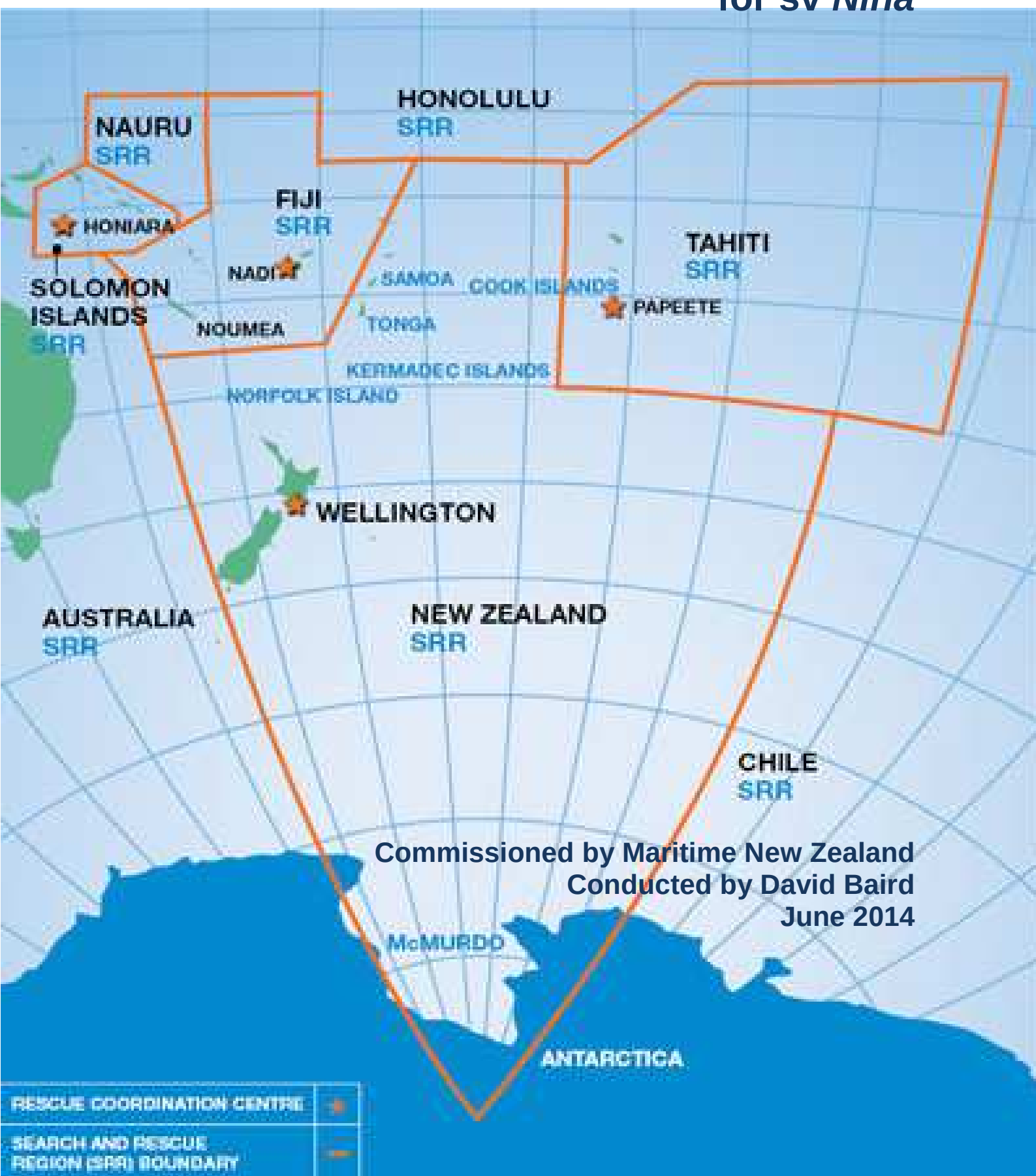


Report of the Independent Review into the Search and Rescue Operations for sv *Nina*



Eternal Father, strong to save
Whose arm has bound the restless wave
Who bidst the mighty ocean deep
Its own appointed limits keep
O hear us when we cry to thee
For those in peril on the sea

The seaman's hymn – Melita – William Whiting 1825 -78

sv *Nina* lost in the Tasman Sea June 2013

**Report of the Independent Review
into the
Search and Rescue Operations
undertaken by
Rescue Coordination Centre
New Zealand
June 2013 to January 2014**

Commissioned by Maritime New Zealand
Carried out by David Baird
June 2014

Abbreviations, Acronyms and Definitions of terms used in this report

AMSA	Australian Maritime Safety Authority
CEO	Chief Executive Officer
CSAR	Classification Synthetic Aperture Radar
DACCSO	Duty Air Component Commander's Staff Officer
ELT	Emergency Locator Transmitter (aviation distress beacon)
EPIRB	Emergency Position Indicating Radio Beacon (marine distress beacon)
ETA	Estimated Time of Arrival
GEOINT	Geographic Intelligence NZ (NZDF)
GIS	Geographic information system
GMDSS	Global Maritime Distress and Safety System
GMTT	Ground Moving Target Indicator
GPS	Global Positioning System
HF	High Frequency marine radio
IAMSAR	International Aeronautical and Maritime Search and Rescue manual
ICAO	International Civil Aviation Organisation
IERCC	International Emergency Response Coordination Centre
IMO	International Maritime Organisation
ISAF	International Sailing Federation
ISAR	Inverse Synthetic Aperture Radar
LKP	Last Known Position
LOA	Length Over All
LoD	Length over Deck
MEOSAR	Medium Earth Orbiting Satellite System for SAR
MH370	Malaysian Airlines flight 370 lost on flight from Kuala Lumpur to Beijing
MNZ	Maritime New Zealand
MOC	Marine Operations Centre (Radio Taupo)
NAVCOMSAR	IMO Committee on Navigation, Communications and Search and Rescue
NoK	Next of Kin
NZ	New Zealand
NZDF	New Zealand Defence Force
P3K2 Orion	Maritime patrol aircraft operated by NZDF
PLB	Personal Locator Beacon (personal distress beacon)
RAAF	Royal Australian Air Force
RCC	Rescue Coordination Centre
RCCAu	Rescue Coordination Centre Australia
RCCNZ	Rescue Coordination Centre New Zealand
RNZAF	Royal New Zealand Air Force
RS	Range Signature
SAD	Search area determination
SAR	Search and rescue
SARMAP	A computer system that provides predictions of movement for drifting objects
SARMC	Search and Rescue Mission Coordinator
SARO	Search and Rescue Officer
SAROP	Search and Rescue Operation

SAROPS	A computer system used by USCG that provides predictions of movement for drifting objects
Sat-phone	A portable telephone that connects directly with a satellite system
SITREP	Situation report
SMC	Search Mission Coordinator
SOLAS	Safety of Life at Sea – International Maritime Convention
SOP	Standard Operating Procedures – RCCNZ SOP Vol1 PO1 RCCNZ Procedures Manual
SPOT	A radio transmitter aligned to the Globalstar satellite system that will send a short text message and a GPS position to a pre programmed destination.
SRR	Search and Rescue Region
SSAR	Spot Synthetic Aperture Radar
SSB	Single Side Band marine radio (receiver/transmitter operating in HF and MF radio frequency)
sv	sailing vessel
TES	Texas EquuSearch
UNCLOS	United Nations convention on Law of the Sea
USA	United States of America
USCG	United States Coast Guard
UTC/utc	Coordinated Universal Time – from the French Temps Universel Coordonne UTC – was called GMT Greenwich Mean Time
VHF	Very High Frequency marine radio
VMR	Volunteer Marine Rescue
YA	Yachting Australia
YNZ	Yachting New Zealand

Dates (dd/mm/yyyy) and times used in this report are expressed as local time for Wellington NZ (utc + 12hrs), unless the suffix utc (2350utc) is used, indicating the date and time is UTC. Some utc dates use the mm/dd/yyyy convention.

Positions are stated using Latitude/Longitude degrees and minutes 33°50's 169°41'e or using decimal degree 33.83270S 169.68940E

Preface

Rescue Coordination Centre New Zealand (RCCNZ) procedures define the requirements for the conduct of reviews and reports into search and rescue action undertaken by RCCNZ. Consistent with these requirements Maritime New Zealand decided that as a result of the size (area), duration and media profile of the search for the *sv Nina* an Independent Review would be commissioned.

Mr David Baird PSM, former General Manager – Australian Maritime Safety Authority, who had responsibility for Rescue Coordination Centre Australia between 1998 and 2008, was engaged by Maritime New Zealand to conduct the Independent Review of Search and Rescue Operation for *sv Nina*.

Throughout the Review Report, David Baird has referred to himself in the first person or as the Reviewer.

Terms of Reference for the review were developed and agreed:

Terms of Reference

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

Guided by these terms of reference this review covers the period of the RCCNZ SAROP from 14th June 2013 through to 23rd January 2014.

At the time of conducting this review no Coronial Inquest for the crew of *Nina* was in progress or proposed. There are a number of issues associated with the loss of the *Nina* that properly belong to a legally constituted Coronial Inquest where expert witnesses may be called upon to provide opinion.

As the Reviewer I have endeavoured to maintain my focus on the intent of the review, RCCNZ's SAROP, and not stray into areas best left to a Coroner.

The *Nina* was a 59ft wooden yacht, built in 1928, refurbished and maintained to original lines by her owner. On a circumnavigation voyage from the USA, *Nina* arrived in New Zealand on 29th December 2011. On 29th May 2013 *Nina* set sail from Opua bound for Newcastle Australia with seven crew on board.

The RCCNZ SAROP for *Nina* began at 0956 Friday 14th June when RCCNZ was advised of concern for the *Nina* which had not arrived as expected at Newcastle. RCCNZ conducted extensive searches of the Tasman Sea, covering some 737,000 square nautical miles, including Lord Howe and Norfolk Island. Shoreline searches were carried out along the west coast of New Zealand. On 5th July 2013 the search was suspended.

Following suspension of RCCNZ's search the families of the *Nina*'s crew commenced their own search with the help of Texas EquuSearch (TES). Air searches were carried out in the Australian coastal region around Newcastle, then in the Tasman Sea, Lord Howe and Norfolk Island and later searches of islands in the Southern Great Barrier Reef Australia.

TES introduced the possibility that satellite derived imagery could find the *Nina*. Thousands of images were assessed and those considered most likely to be the *Nina* or a life raft were provided to RCCNZ for consideration. Expert assessment of satellite images determined that they were unlikely to be the *Nina*. RCCNZ also committed significant resources to TES for drift modelling and search area determination in support of the private search effort.

Despite the efforts of all involved with the RCCNZ search and the private search the *Nina* and her crew have not been found.

In undertaking this review I have reviewed all the logs, emails and associated correspondence held by RCCNZ. I have conducted one to one discussions with MNZ Management, RCCNZ Managers and SAROs, RNZAF personnel, RCC Australia staff, and other significant stakeholders¹. For family and friends I have had one to one discussion with Ricky and Robyn Wright, including telephone hook up with Ian and Sue Wootton and Ralph Baird from TES. Families of the *Nina* crew submitted two written submissions to the review.

I would like to place on record my appreciation and thanks for the information and candid opinions that the stakeholders and families were prepared to share with me.

David Baird PSM
Independent Reviewer – SAROP for sv *Nina*
June 2014

¹ Stakeholders consulted are listed at Appendix 15.1

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1 Executive Summary

1.1 The *Nina* and the voyage

The *Nina* was a 59ft LoD (18mt) wooden, staysail schooner, built in 1928. She had been refurbished and maintained to original lines by her owner, who has owned the *Nina* since 1988. On a circumnavigation voyage started in 2008 from the USA, *Nina* had crossed the Pacific Ocean and arrived in Opuia New Zealand from Tonga on 29th December 2011. On 29th May 2013 *Nina* set sail from Opuia bound for Newcastle Australia with six USA citizens and one British citizen; on board.

The *Nina* had been fitted with a new engine in Opuia, and the owner intended to slip the vessel for further maintenance in Australia. She carried a basic safety inventory which included a seven man inflatable life raft. The VHF radio on board was suitable for coastal sailing. With no HF radio on board, long distance communication was reliant on a satellite telephone operating on the Iridium service. For distress alerting, in addition to distress flares, a single 406MHz EPIRB was carried. This EPIRB, first registered in the USA in 2008, was of the older type that are not GPS enabled. One of the crew also had on board a SPOT transmitter.

1.2 RCCNZ search

The RCCNZ SAROP for *Nina* began at 0956 Friday 14th June when RCCNZ was advised by friends of the crew that they had concern for the *Nina* which had not arrived as planned at Newcastle, with the last communication with the yacht being on 4th June.

Following a period of communication searching and after the estimated worst case ETA at Newcastle active searching commenced and RCCNZ coordinated extensive searches of the Tasman Sea, covering some 737,000 square nautical miles, including Lord Howe and Norfolk Island. These searches used the recently refurbished RNZAF P3K2 Orion maritime surveillance aircraft. RNZAF crews reported that they: *were highly confident in the integrity of the radar search based on the briefed target.*

Shoreline searches were carried out along the west coast of New Zealand. No distress calls were received and no trace of the *Nina* was found. RCCNZ suspended the search on 5th July 2013.

During the search significant difficulties were encountered by RCCNZ in obtaining, information from Iridium, relating to satellite phone transmissions from the *Nina*. Only after the intervention of the US State Department did Iridium release to RCCNZ on 3rd July details, of probably the last transmission from the *Nina* sent on 4th June.

1.3 Private search

Following the RCCNZ decision to suspend searching, families of the *Nina*'s crew, commenced their own search for the *Nina*. They enlisted the help of TES to coordinate this private search. Air searches were carried out in the Australian coastal region around the Newcastle area, then in the Tasman Sea, Lord Howe and Norfolk Island. Later in January 2014 coastal searches of islands in the Southern Great Barrier Reef Australia were undertaken.

RCCNZ committed significant resources to TES for drift modelling and search area determination in support of the private search.

TES introduced the possibility that satellite derived imagery could find the *Nina*. Thousands of images were assessed and those considered most likely to be the *Nina* or a life raft were provided to RCCNZ for consideration. RCCNZ enlisted the help of the NZ Defence Force experts GEOINT to analyse and assess the images. Their analysis found; the probability that the identified feature was the sv *Nina* is <1% and the probability the identified feature was a wave top is >90%.

1.4 Review Findings

MNZ, RCCNZ, the Managers, SAROs and staff carried out the SAROP for the *Nina* in full compliance with the SAR Convention and RCCNZ's SOP's.

In many areas RCCNZ went well beyond the requirements of the SAR Convention and RCCNZ's SOP's, demonstrating conviction, compassion and determination to achieve a satisfactory search result.

RCCNZ went further in effort, resource allocation, consultation and duration than many of the other highly regarded SAR Authorities would have done. This is particularly so when considering the effort made by RCCNZ to cooperate and assist the private search carried out by the families and their search coordinator TES.

However the *Nina* and the crew were not found. It is my firm view as the Reviewer that this unfortunate result cannot not be attributed to any lack of action, commitment or effort by MNZ, RCCNZ, RNZAF and others involved with the RCCNZ coordinated search.

There are a number of issues associated with the loss of the *Nina* that properly belong to a legally constituted Coronial Inquiry where expert witnesses may be called upon to provide opinion.

As the Reviewer I have endeavoured to maintain my focus on the intent of the review, namely RCCNZ's SAROP for the *Nina*. However in reviewing the operation and analysing the resultant actions, there have been times when, by necessity issues best addressed by a Coroner are examined and an opinion is formed. This is particularly relevant to the stage of the SAROP where the decision to suspend search operations is made.

While this SAROP was carried out to a high standard, there are as with any operation, issues arising that identify areas that could be improvement. This review is part of the RCCNZ continuous improvement process. The identified opportunities and recommendations made are provided as suggestions for MNZ and RCCNZ to consider in their quest for continuous improvement of the RCCNZ's SOPs.

Some of these opportunities and recommendations may be seen by some as evidence of "failure" by RCCNZ. This is not the case. It is the strongly held opinion of the Reviewer that had MNZ and RCCNZ addressed these issues associated with RCCNZ's SOPs before May 2013, the timetable of action in the search for the *Nina* may have been a little different, but the outcome of the SAROP would have been the same.

2 Summary of Recommendations

This summary of recommendations is presented with no order of ranking but in particular categories. Summary of each recommendation is accompanied by a reference number to enable easy location of the recommendation in the body of the report.

Review and amend RCCNZ SOP Vol 1 PO1 requiring:

- Better procedure and record keeping for tactical handover between SMCs at shift change – 5.3.3
- Better procedure for notifying NoK – 6.5.3
- Better procedure for determining and ranking LKP, particularly where there are multiple possibilities – 7.4.5
- A communications plan for dealing with those interested parties that are not NoK – 8.3
- A communications plan for handling “social media” comments and allegations – 8.3
- Develop with RNZAF a “SAR capability statement” for P3K2 Orion aircraft – 9.3
- Better clarity and distinction between Conclusion; Termination and Suspension of a search – 11.3
- Develop guidance for SAROs and Managers regarding access to the RCC during searches – 11.3
- Developing guidance for SAROs and RCCNZ Managers in dealing with integration of private searches, and service delivery to post suspension private searches – 13.1.3

Engage with Iridium and other satellite phone providers to ensure:

- Easier release of transmitted information – 7.3.3

Engage with IMO/ICAO raising issues associated with;

- Gaining prompt release of information from satellite phone service providers – 7.3.3
- Use of satellite derived images in SAR – 13.2.3
- Conducting trials in the Tasman Sea to find known targets using satellite images – 13.2.3

Engage with Yachting New Zealand to make cruising yachts safer:

- Review Cat 1 requirements for NZ yachts going overseas to ensure from a SAR perspective that they meet world's best practice – 12.3
- With NZ Customs and Yachting New Zealand review and change the small craft details of the Outward Declaration – 12.3
- Develop an education campaign targeting foreign yachts leaving NZ for overseas to have better safety equipment – 12.3

3 Vessel description – equipment – crew – sailing plan

3.1 The *Nina*

The *Nina* is a 59ft LoD (18mtr) wooden, staysail schooner, built in 1928. She had been refurbished and maintained to original lines by her owner David Dyche, who has owned the *Nina* since 1988.

The vessel has white topsides, tan masts, green boot topping (anti fouling) and wood varnish deck house. *Nina* had a single screw diesel engine that could power the vessel at 6kts. Due to problems with the engine, a new Cummins 4B 150 engine was purchased in Opuia, and fitted into the *Nina* by the owner. Two electric bilge pumps were fitted. It is not known if the *Nina* had on board any solar or wind energy electric generators. None of the photographs show any wind turbine or solar panels on the vessel. Tank capacity on board was 370lts of diesel giving about 3 days at cruising speed and 750lts of fresh water. It is not known if there was any desalination equipment on board.

With David Dyche as owner the *Nina* had made a number of trans-Atlantic voyages. She crossed the Pacific and arrived in Opuia NZ from Tonga on 29th December 2011, as part of a planned circumnavigation which started from the USA in 2008. On 7th January 2013 she competed in the 37th Tall Ships and Classic Invitation race in the Bay of Islands, finishing first on handicap in her class.



3.2 Safety equipment

Nina was fitted out with a basic cruising inventory, having a wooden tender with a 15hp outboard carried and secured on deck between the masts, an eight man inflatable life raft secured abaft the mainmast and parachute distress flares. Communications was by VHF radio, satellite phone and one 406 MHz EPIRB. Steering position is aft of the deck house where a tiller is located. (It is not known if an auto pilot was fitted). There is no evidence in any of the *Nina* photos of a self-sailing wind vane being fitted.

3.3 Crew

The *Nina* had seven in the crew. The owner/captain David Dyche, his wife and son along with four others being friends and acquaintances. Details of the crew are at Appendix 15.2

3.4 Passage plan

Having arrived in Opuia on 29th December 2011, from Costa Rica, via Tahiti and Tonga, it was David Dyche's intention to remain in New Zealand until some date early in 2013, when they would head for Australia.

He had provided Australian Customs with pre-arrival details for the *Nina*, with six crew being David Dyche, his wife, son and three others. The three others were to be different people to the four in 3.3 above. The ETA for Sydney was 15th February 2013.

Sometime in January David Dyche advised Australian Customs that *"due to engine failure we will be in New Zealand for another 2 to 3 monthsso please cancel our advanced arrival notice"*.

A new Cummins 150 engine was fitted into the *Nina* at Opuia during March/April. On completion of engine fit out sea trials were carried out. The company who supplied the new engine would not sign off on the "new engine" warranty, as the engine had been fitted by the owner and there were issues with shaft alignment. This resulted in abnormal engine vibration and the need to limit engine revolutions to below the designed maximum. It was also observed that there was significant ingress of water through the stern gland while the engine was running. This concerned the engine supplier but the owner was apparently not concerned.

In preparation for departure crew member Evi Nemeth contacted RCCNZ (24th May) to advise that *Nina* would be leaving Opuia on the 26/27th May and heading for Brisbane or Newcastle. She advised they had no SSB only a sat-phone, and requested the contact numbers for RCCNZ and RCCAu.

Same day reply from RCCNZ provided the contact details for RCCAu, RCCNZ and Taupo Maritime Radio². RCCNZ also asks if *Nina* has a tracking device on board and added:-

"For safety monitoring purposes I suggest you contact Taupo Maritime Radio to set up a regular 24hour contact schedule via your satellite phone"

Evi Nemeth replied:-

"Have SPOT – not sure if it would work between NZ & Australia – Do not have SSB – but can establish a sked with Taupo Radio on satphone."

² Taupo Maritime Radio/ ZLM is the local name for the Marine Operations Centre (MOC) that provides GMDSS services for MNZ. Details are at Appendix 15.3

Evi Nemeth took the SPOT GPS transmitter she had on her yacht *Wonderland* with her to the *Nina*. Her son Laszlo Nemeth was the person authorised to receive transmission updates from SPOT.

RCCNZ later asked if *Nina* had a 406 EPIRB and if yes what was the Hex ID number?

On 28th May by email Evi provided RCCNZ with the 406 Beacon Hex ID for *Nina*.

New Zealand Customs Service Outward Report (Small Craft)³ was completed by David Dyche noting a departure time of 1000 29th May 2013, with the intended itinerary being Opuia to Newcastle Australia. Australian Customs had an ETA for *Nina* at Newcastle on 8th June 2013.

3.5 The Voyage

The *Nina* left Opuia in the forenoon of Wednesday 29th May bound for Newcastle Australia. Taupo Maritime Radio has no record of any contact from *Nina* regarding departure time or a request for establishing a radio schedule. Evi Nemeth had previously used the services of Bob McDavitt for weather forecasts and passage planning during her voyage on her yacht *Wonderland*. There was no such request for services made to Bob McDavitt from the *Nina* before she sailed from Opuia. Bob McDavitt is a well-known and respected meteorologist who retired in 2012 from the NZ Met office where he had responsibility for marine and aviation weather forecasting. Now as a consultant he provides services to cruising yachts, providing weather forecasts and voyage forecasts. (www.metbob.com.)

It was not until 1500 Monday 3rd June that Evi Nemeth called Bob McDavitt indicating that they were experiencing some rough weather and requested a weather forecast and best passage advice. Evi Nemeth and Bob McDavitt made a number of text and email exchanges through Monday 3rd and Tuesday 4th June. The critical messages are detailed below.

0930 – Tuesday 4th June – text message via satphone Evi Nemeth to Bob McDavitt:-
Any weather for *Nina* – S33 54 E165 18

1125 – Tuesday 4th June Bob McDavitt replies:-

Stay hove-to until around 6pm Wednesday. SW wind peak at 45 to 60 kts was around 6am today. Peak swell 8 significant around 9pm tonight

1150 – Tuesday 4th June – Evi Nemeth replies to Bob McDavitt and or possibly others:-

Thanks storm sails shredded last night, now bare poles. Going 4kts 310 deg. Will update course info at 6pm.

THIS **1150** MESSAGE WAS NEVER DELIVERED TO BOB McDAVITT AND OR OTHERS. IT REMAINED IN THE IRIDIUM SYSTEM UNTILL FINALLY RELEASED BY IRIDIUM TO RCCNZ ON **WEDNESDAY 3RD JULY**.

³ NZ Customs Outward Report for *Nina* is at Appendix 15.9

Bob McDavitt sent a message to Evi Nemeth on 6th June and again on 7th June providing weather advice and asking how things were progressing. He received no response to either message.

The SPOT transmitter was activated on the 29th, 30th, 31st May, and 2nd June, giving a position and indicating “everything is OK”. Positions indicate that the track followed was a conventional coastal passage along the NE coast of New Zealand and then WNW towards Australia. Distance travelled was 323nm giving an average speed of 3.4kts.

3.6 Concern for the *Nina*

At 0956 Friday 14th June RCCNZ received an email from Ted Cary, s/v *Sequester* at Opuā:-

*Attn Maritime SAR dept. – This is to inform you of concerns regarding the vessel “Nina”, departed Opuā morning of May 28 bound for Newcastle Australia. A classic (1928) schooner 70ft loa, 10 people on board. No SSB radio, but had a sa-phone on board, and a SPOT transmitter expected to register their location daily. Last contact was with Bob McDavitt on June 4th, via sat-phone, regarding advice to minimise contact with an approaching low. Intent was to heave to at 33deg 54’s 165deg 18’e until conditions abated. I note that the conditions for sailing towards Newcastle from here have been less than ideal since then, so it is to be expected that they would be overdue, but because all communications have ceased concerned parties asked that I inform you of the situation and request that shipping and aircraft in the vicinity be aware and report any sightings or contact. Please contact me for any further information, or with any updates. Thanks, Ted Cary s/v *Sequester*, Opuā.*

4 RCCNZ Search and Rescue Operations

4.1 SAR Coordinating Authority

New Zealand is a Party to the United Nations Convention on the Law of the Sea (UNCLOS), International Convention for Safety at Sea (SOLAS), the International Convention on Maritime Search and Rescue (SAR Convention) and the Convention on International Civil Aviation (ICAO Convention).

As a Party to these conventions, New Zealand in fulfilling its obligations, has undertaken to meet the following requirements:

“Every coastal State shall promote the establishment, operation and maintenance of an adequate and effective search and rescue service regarding safety on or over the water and where circumstances so require by way of mutual arrangements cooperate with neighbouring States for this purpose.” (UNCLOS Article 98 paragraph 2)

“Parties having accepted responsibility to provide search and rescue services for a specified area shall use search and rescue units and other available facilities for providing assistance to a person who is or appears to be in distress at sea.” (SAR Convention 2.1.9)

“Parties shall ensure that assistance be provided to any person in distress at sea. They shall do so regardless of the nationality or status of such a person or the circumstances in which the person is found.” (SAR Convention 2.1.10)

“Each rescue coordination centre shall be operational on a 24-hour basis and be constantly staffed by trained personnel having a working knowledge of the English language” (SAR Convention 2.3.3)

“Whenever practicable, each Party should establish joint rescue coordination centres and rescue sub-centres to serve both maritime and aeronautical purposes”. (SAR Convention 2.4.2)

“Parties either individually or in cooperation with other States, shall ensure that they are capable on a 24-hour basis of promptly and reliably receiving distress alerts from equipment used for this purpose within their search and rescue regions. (SAR Convention 4.2.1)

The selected extracts above from the Conventions are provided to illustrate the requirements for SAR that a contracting coastal State should comply with.

4.1.1 Observation

This Review finds that the New Zealand Government through MNZ and RCCNZ are fulfilling not just the key requirements above but all the requirements of the SAR Convention to a high standard.

4.2 Search and Rescue Manuals

The International Civil Aviation Organisation (ICAO) and the international Maritime Organization (IMO), the two agencies of the United Nations devoted to aeronautical and maritime transport safety, have jointly developed and produced the International

Aeronautical and Maritime Search and Rescue Manual (IAMSAR Manual). The primary purpose of the IAMSAR Manual is to assist States in meeting their own SAR needs, and the obligations they have accepted under the SOLAS Convention, SAR Convention and ICAO Convention.

The RCCNZ Procedure Manual, Search and Rescue Incidents, SOP Vol 1 PO1, is set up to meet local conditions, but is aligned to the principles laid out in the IAMSAR Manual.

4.3 NZ Search and Rescue Region and SAR Coordinating Authorities

The New Zealand Government requires MNZ through RCCNZ to fulfil New Zealand's commitment and obligations to the Search and Rescue component of the International Conventions and the IAMSAR Manual.

Search and Rescue in the New Zealand's specified search and rescue region (NZSRR)⁴ is undertaken by two coordinating Authorities – RCCNZ and New Zealand Police.

NZ Police and RCCNZ communicate and cooperate closely in many SAR events
Division of responsibility for SAR events is:

Category I SAROP incidents are coordinated at a local level by NZ Police and typically involve land-based search and rescue operations and marine SAR missions, usually within a few miles of the coast.

Category II SAROP incidents are coordinated at a national level by RCCNZ and typically involve missing aircraft or vessels, or people who have activated distress beacons, within the NZSRR. They can also involve the coordination of international SAR operations including civil and military resources.

The SAROP for the *Nina* was clearly a Category II search and this was recognised by the NZ SAR Coordinating Authorities right from the start; when at 0956 on Friday 14th June the RCCNZ was advised by email from Ted Cary that there were concerns for a USA flag yacht *Nina* sailing from Opua to Newcastle Australia with 10 people on board.

4.4 RCCNZ Capability

The RCCNZ provides SAR services 24 hours a day, 7 days a week, 365 days a year from its RCC at Avalon – Lower Hutt, just outside Wellington, New Zealand's capital city.

The RCC is fitted out with sophisticated communications and tracking equipment including that for the detection of distress beacons received by the Cospas-Sarsat system. RCCNZ will receive notification of all beacon detections in the NZSRR, and for a New Zealand registered beacon detection anywhere in the world. New Zealand is a member of the Cospas-Sarsat system as a ground segment provider.

Located alongside RCCNZ at Avalon is the Maritime Operations Centre (MOC). The MOC provides VHF and HF radio services for New Zealand's coastal waters and the

⁴ chart of NZ SAR Region is at Appendix 15.4

South Pacific, including around-the-clock monitoring of radio frequencies for distress messages. The radio call-sign MOC's HF and oceanic radio service is Taupo Maritime Radio/ZLM.

The SAR officers (SAROs) working for RCCNZ are trained to international aviation and maritime SAR standards and have a wide range of experience in aviation, marine and land search and rescue.

4.4.1 Observation

The Cospas-Sarsat system, since its inception in 1982 has probably the made the greatest contribution to marine SAR since ships started to carry short wave radio. Cospas-Sarsat system beacons are effective not only for marine (EPIRB) but also for aviation (ELT) and hiking/adventure activities (PLB). PLBs are also used in marine and aviation in addition to EPIRBs and ELTs.

A 406MHz distress beacon with GPS capability when activated will take the SEARCH out of SAR and allow the rescue to take place much sooner.

RCCNZ is an active participant in the Cospas-Sarsat forums where continuous improvements to the system are discussed and implemented. MNZ is currently in the process of implementing the next generation of Cospas-Sarsat capability; known as MEOSAR; by installing a new ground segment. The new system will enhance the system's capability in the region.

4.5 RCCNZ aviation capability

Responsible for one of the larger SRRs in the world, the RCCNZ responds to approximately 900 search and rescue incidents annually.

Having a large area of the Southern Ocean and Tasman Sea to cover means RCCNZ must have access to a long range aviation search capability. This is provided under a New Zealand Government arrangement, where the RNZAF make available to RCCNZ, air force assets that are capable of long range maritime search.

RNZAF operate a number of P3K2 Orion aircraft with this capability. They are fitted out with a sophisticated suite of electronic maritime search equipment. P3K2 Orion also has the capability to drop emergency supplies such as life rafts, communications equipment and supplies to distressed craft. RNZAF also have available C130 Hercules aircraft that may be used for search or dropping supplies during a SAROP.

The RNZAF P3K2 Orion used in the search for the *Nina* is fitted with state of the art radar, the Israeli Elta EL/M 2022A[V]3, which is capable of detecting small targets on the surface (and in the air) from long range. It is a multi-mode radar that includes sophisticated modes for tracking and identifying targets in a maritime (and land) surface environment, including Inverse Synthetic Aperture Radar (ISAR), Classification Synthetic Aperture Radar (CSAR), Range Signature (RS), Spot Synthetic Aperture Radar (SSAR) and Ground Moving Target Indicator (GMTT). While the specifics of the capabilities of this radar are classified it is noted that during the searches for the *Nina*; the P3K2 Orion located and identified a number of targets (yachts) that were smaller than the *Nina*.

During the search when requested by RCCNZ for details of the P3K2 Orion performance RNZAF responded:

Search and Rescue (SAR) operations are a core role of the Royal New Zealand Air Force (RNZAF). The RNZAF allocate a significant amount of time and resources to ascertain the performance of the P-3 Orion aircraft's Elta ELM-2022 radar. This information is used to provide a baseline for mission planning. Based on the data collected during performance testing the RNZAF is satisfied that the detection capability provided by this new radar has significantly increased the Air Force's ability to conduct maritime search and rescue for vessels like the Nina, specifically ocean-going single and double-mast yachts.

*The historical performance data obtained during this testing is an important part of all Search and Rescue mission planning. A conservative approach to maximum detection range for any particular situation is taken whereby the planned search range is approximately 75% of the baseline detection range. This provides a high probability of detection on SAR operations. For this particular search situation involving a radar-primary search for a 60ft wooden ketch, the observed radar performance was **significantly** better than the baseline data. Therefore the crews that flew on the numerous Search and Rescue missions in support of the NZ RCC-led search effort were highly confident in the integrity of the radar search based on the briefed target.*

RCCNZ has a close working relationship with RNZAF, and their representative is frequently in the RCC during searches. In order to access the RNZAF assets RCCNZ needs to justify to the RNZAF the need for the aircraft and assure the RNZAF that there are no civilian assets available.

RCCNZ has arrangements in place with civilian aircraft providers, where they can access fixed and rotary wing aircraft for searches closer to shore and inland.

4.6 RCCNZ Search planning - SARMAP

As its main marine search planning tool RCCNZ uses SARMAP⁵, which is a GIS-based search and rescue modelling tool 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.

As their SAR planning tool RCCAu also use SARMAP and USCG use a similar system, however they call their system SAROPS.

⁵ Detailed description of SARMAP is at Appendix 15.5

5 Uncertainty Phase – “Doubt” - 14th June to 17th June

5.1 SAR Convention and RCCNZ SOP – Uncertainty Phase

SAR Convention 4.4.1 - Uncertainty phase:

- When a person has been reported as missing, or a vessel or other craft is overdue
- When a person, a vessel or other craft has failed to make an expected position or safety report

RCCNZ SOP Vol 1 PO1 – Annex PO1-3A – 1 Uncertainty Phase

1.1 An Uncertainty Phase is said to exist when there is knowledge of a situation that may need to be monitored, or more information is required. This situation may require the despatch of resources.

1.2 The Uncertainty phase is declared when there is **doubt** regarding the safety of an aircraft, ship or other craft or persons on board. The situation should be investigated and information gathered. A communications search may begin during this phase. In the case of ships or other craft the Uncertainty Phase would be declared when it has:

- (a) Been reported as late at its intended destination
- (b) Failed to make an expected position safety report

5.2 SAROP *Nina* – Uncertainty Phase

At 0956 Friday 14th June 2013, RCCNZ, on receipt of the email from Ted Cary, commenced the Uncertainty Phase of the search for the *Nina*. During the next six hours RCCNZ day shift SAROs had:

Contacted the MOC (Taupo Maritime Radio) who advise that they have had no radio or phone contact with the *Nina* and provided RCCNZ with the NZ Customs Outward Report⁶. This established that there was a 406MHzEPIRB, a sat-phone, and VHF radio, on board; but no HF/SSB radio. Organised for MOC to commence wide area broadcasts asking vessels to report any sightings or contacts with *Nina*.

Contacted RCCAu to establish if *Nina* had arrived at Newcastle or any other Australian port. Received advice from RCCAu that Australian Customs had and ETA for *Nina* as Sunday 8th June at Newcastle but she has not arrived.

Discussed the situation with Ted Cary, when it was established that there were seven in the crew and not ten as previously advised. RCCNZ were also advised that a new engine had recently been fitted, but was not given enough time to run in. Ted Cary also advised that Evi Nemeth would have her SPOT GPS transmitting device on board.

Through Ted Cary RCCNZ received an email sent from Bob McDavitt to Curly Carswell, a friend of Evi Nemeth, which provided details of advice from Bob McDavitt on 3rd June to “heave too” and allow the storm to pass and the last

⁶ Outward Customs Report is at Appendix 15.9

message he had received from Evi Nemeth on the 4th June. This gave a position for *Nina* on Tuesday 4th June at 33° 54'S 165° 18'E.

Bob McDavitt advised that he had received no response to messages he sent to Evi Nemeth on 6th and 7th June.

Bob McDavitt also wrote *"Do you know if they have an EPIRB on board? If so then they will let it off if they need to, and since they haven't as far as I know all is OK, but comms may be down"*.

Checked various websites relating to the *Nina* obtaining technical and historic details of the vessel.

Called the Iridium satphone on *Nina*. Call went to message bank so left a message to call RCCNZ.

After seven hours the RCCNZ SAROs had a reasonable picture of what was now considered to be an overdue yacht on a voyage from Opuā to Newcastle. Australian Customs had advised that the *Nina* had an ETA of 8th June and had not arrived.

They knew that the vessel encountered rough weather and had been advised to "heave too" until the storm had passed.

They had technical details of the yacht, type, dimensions, construction material, age and sailing history. Single screw, Cummins 4B 150 engine, newly fitted and tested in Opuā. Eight man inflatable life raft and 10ft wooden tender

They had knowledge of the communications fit out, a contact number for the satphone that was on the vessel. Details of the US 406MHz distress beacon and the latest registration date 9th May 2013 had been obtained. They were aware that there was a SPOT GPS transmitting device on board.

They had details of the seven crew on board with their NoK details and contact numbers. Contact verbal and email had been made with Ted Cary, the friend of Evi Nemeth who had raised the initial concern. Details of the last known message from Evi Nemeth to her weather advisor Bob Mc Davitt were provided along with a position of the yacht at that time.

During the next three RCCNZ shifts:

The communications search continued and wide area broadcasts to shipping were going out. It was established that *Nina* was not at Lord Howe Island (15th June).

Discussions were held with RCCAu regarding the possible ETA in Australia. It was considered that allowing for the weather over the last ten days the ETA for the vessel could be as late as Monday 17th June at Lord Howe Island and Tuesday 25th June at Newcastle.

Discussions by email continued with Iridium regarding *Nina* sat-phone transmissions and geo-position where these transmissions were made.

Iridium provided a geo-position for a sat-phone transmission made at 1150 Tuesday 4th June being at 33 50s 169 41e.

This time of 1150 did not correlate with earlier information received so RCCNZ called Bob McDavitt regarding his last contacts with Evi Nemeth. Bob McDavitt advised his last contacts from Evi Nemeth were an email at 0939 and a text at 0953 on Tuesday 4th June; both messages had the same context, being a request for update and giving position, speed and course but were slightly different

0939 email *“Any update 4 Nina? We R 33 54s 165 18e, 3.5kt 310deg - Evi*
0953 text *“Any updates for Nina? We 33 53s 165 18e 3.5kt 320deg – Evi*

Ted Cary was called on a number of occasions and was provided with a situation report regarding wide area broadcasts and RCCNZ thinking regarding the later ETA at Newcastle. Ted Cary said he would inform relatives and friends. Ted Cary advised that he had received the last SPOT information from Evi’ Nemeth’s son Laszlo Nemeth – 020048 UTC June 2013 with position 33 59s 168 52e.

This information was followed up with SPOT operators in the USA and a request made that RCCNZ be advised if there were any further transmissions from this SPOT device.

An enquiry was made to the RNZAF as to the status of any RNZAF assets (aircraft) that may be operating in the Tasman Sea. RNZAF advised there were no planned flights in the Tasman Sea before Wednesday 19th June when a flight was scheduled towards Minerva Reef.

5.3 Conclusion Uncertainty phase

At 1524 on Monday 17th June, following a discussion in the RCCNZ the status of the incident was elevated from Uncertainty Phase to Alert Phase.

The Uncertainty Phase had commenced during the RCCNZ day shift Friday 14th June at 0956 and concluded on day shift Monday 17th June at 1524.

It had lasted 3.2 days.

This is not considered unreasonable when the “message raising concern” – **doubt** - was transmitted to RCCNZ 13.7days after the last SPOT message was received, and ten days after the last contact from Evi Nemeth to Bob McDavitt.

5.3.1 Observations

The SAROs fulfilled their duties and the requirements of the Uncertainty Phase SOP to a high standard.

The information they obtained during the Uncertainty Phase was relevant, comprehensive and well documented.

There was a clear understanding and good situational awareness amongst the SARO Teams. The diverse backgrounds and experience of the SAROs was shared and put to good effect.

A regular link with Ted Cary was established and he had undertaken to keep family and friends advised of RCCNZ actions and progress.

5.3.2 Opportunities

Noting the time difference between the USA and NZ, night shift SAROs on the 14/15th June could have been contacting US entities such as Iridium, SPOT, NoK etc at the start of their business day, in the last quarter of the night shift. Most of these tasks were undertaken by the day shifts.

RCCNZ's SOP has an aide memoir for use during handover between shifts. There is also a Handover Notes section in the Incident Management System. While both were utilised during the *Nina* SAROP they are not automatically included in the Incident Log. Both could have been used more effectively during the formal handover between SMC outgoing and incoming at shift change. A plan should be developed as to what is to be achieved in the next shift. All this information needs to be properly documented in detail in the log.

5.3.3 Recommendation

RCCNZ should review and amend the SOP to require that, during an incident, at shift changeover, the outgoing SMC and the incoming SMC agree and document in the log, the outstanding tasks to be completed and develop a plan for the next shift to undertake.

6 Alert Phase – “Apprehension” - 17th June to 27th June

6.1 SAR Convention and RCCNZ SOP – Alert Phase

SAR Convention 4.4.2 - Alert Phase:

- When following the uncertainty phase, attempts to establish contact with a person, a vessel or other craft have failed and enquiries addressed to other appropriate sources have been unsuccessful.
- When information has been received indicating that the operating efficiency of a vessel or other craft is impaired, but not to the extent that a distress situation is likely.

RCCNZ SOP Vol 1 PO1 – Annex PO1-3A – 2 Alert Phase

2.1 The Alert Phase exists when an aircraft, ship or other craft or persons on board are having difficulty and may need assistance, but are not in immediate danger.

Apprehension is associated with Alert Phase, but there is no known threat requiring immediate action.

2.2 SRUs may be despatched or other SAR facilities diverted to provide assistance if it is believed that conditions might worsen, or that SAR facilities might not be available, or able to provide assistance if it is believed that conditions might worsen at a later time.

2.3 For overdue craft, the Alert Phase is considered when there is a continued lack of information concerning the progress or position of a craft. SAR resources should begin or continue communications searches, and the despatch of SRUs to investigate high-probability locations or overfly the crafts intended course should be considered. Vessels and aircraft passing through (or expected to pass through) areas where craft might be located should be asked to maintain a sharp lookout, report sightings and render assistance if needed whilst maintaining communications with RCCNZ.

2.4 An Alert Phase is declared when:

- (a) Following the Uncertainty Phase, and when subsequent attempts to establish communication with the aircraft, ship or other craft have failed, or enquiries to other relevant sources have failed to reveal any news of the craft.
- (b) Information has been received which indicates that the operating efficiency of the aircraft, ship, or other craft has been impaired, but not to the extent that a distress situation is likely, except when evidence exists that would allay apprehension as to the safety the craft and its occupants or
- (c) The Master of a vessel is of the opinion that there is conclusive evidence that pirates or armed robbers or acts of terrorism threaten the safety of his ship.

The Alert Phase in the search for the *Nina* commenced at 1524 Monday 17th June. For the RCCNZ the Alert Phase was in the realm of 2.4(a) above.

It needs to be remembered that the content of the last sat-phone transmission from *Nina* at 1150 Tuesday 4th June was not yet known, only the positions provided by Iridium and the crew.

6.2 Communications and no distress calls

At this time (17th June) the general view was that the *Nina* had suffered communications disruption during heavy weather and was now a significantly delayed vessel still proceeding to Newcastle. This arrival could reasonably be

expected to be as late as 25th June due to the poor weather experienced in the Tasman Sea since the 4th June. They had a 406MHz distress beacon, and experienced mariners on board who knew the significance and importance of a signal from a 406MHz distress beacon. They would only use it if they were in grave and imminent danger.

6.3 Last known position

RCCNZ had a number of positions for the *Nina* to work with:

2 nd June 1248 – SPOT -	33° 59's 168° 52'e
4 th June 0939 – Email -	33° 54's 165° 18'e
4 th June 0953 – Text	33° 53's 165° 18'e
4 th June 1150 – Iridium	33° 50's 169° 41'e ⁷

RCCNZ had placed their confidence in the Iridium position for 4th June 1150. Their reasoning for this was there were no clear grounds to dispute the information provided by Iridium regarding the veracity of their position calculations. Iridium claim a +/- accuracy of 10kms 90% of the time for 90% of subscribers.

The judgement at this time was that the position provided by the crew was delivered by text message and could be subject to human error in entering numerals to a key pad/board.

RCCNZ upgraded the wide area broadcasts to PAN - Urgency. They continued calling the *Nina*'s sat-phone with no reply. They maintained contact with IERCC (SPOT) and Iridium seeking contact news, but no information was forthcoming. Contact with RCCAu confirmed that *Nina* had not arrived at Lord Howe Island or another Australian port; checks are also made with Norfolk Island.

6.4 Search planning

RCCNZ was in frequent discussions with RCCAu, on a range of issues associated with the search. On 26th June RCCAu advised that they now recognised *Nina* as an overdue vessel. It was agreed that RCCAu would commence a wide area broadcast in their SRR. Australian Police SAR coordinators were asked to arrange PAN/Urgency broadcasts to go out through VMR bases, Port Authority radio, and fishing company radio networks.

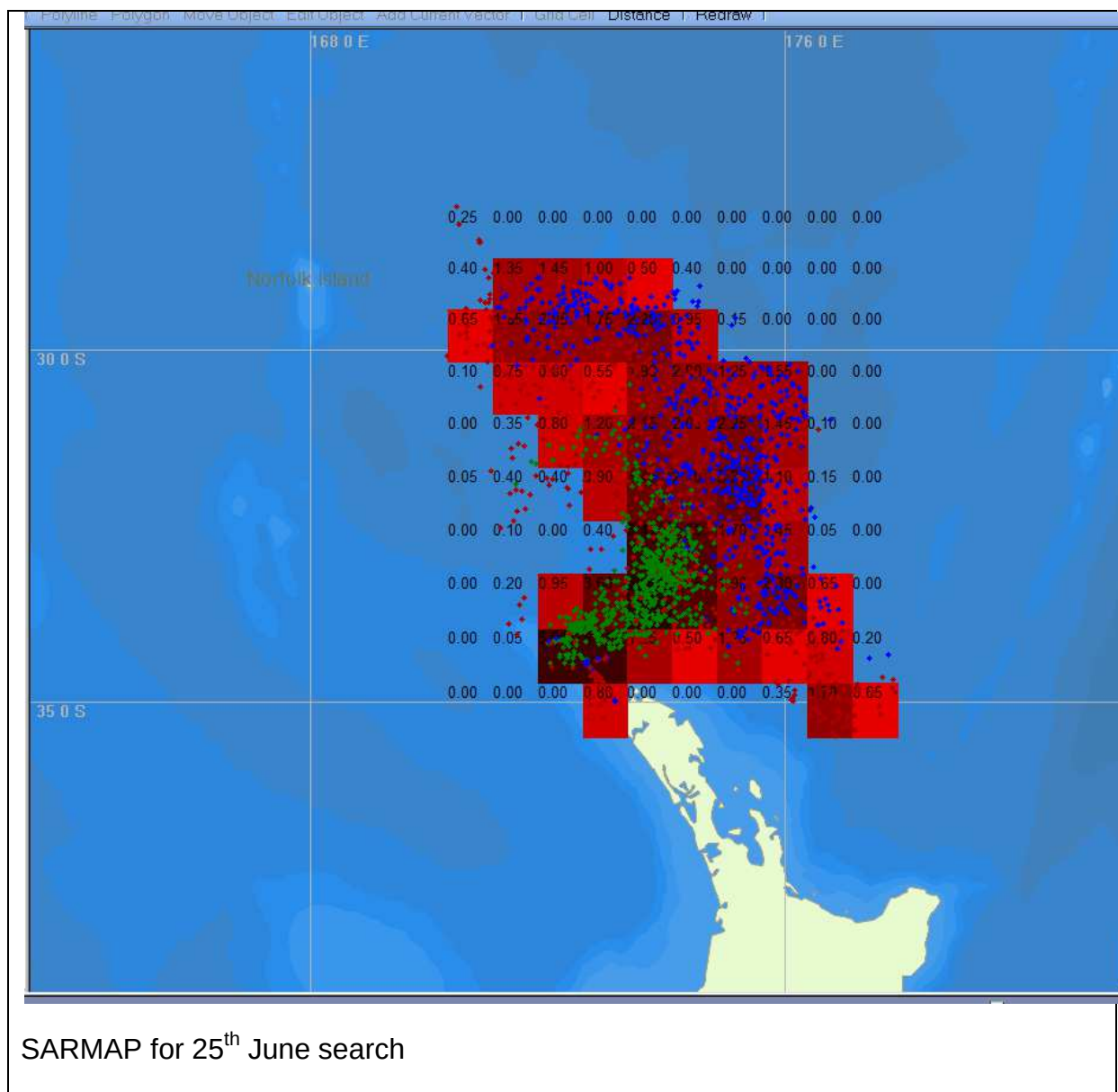
RCCNZ kept RCCAu advised of search activity taking place, particularly when it was planned for the RNZAF to search across the Tasman to the Australian coast. RCCAu also ran their version of SARMAP for various scenarios sharing the result with RCCNZ. The RCCAu results were consistent with those of RCCNZ, giving confidence to the search planning effort by RCCNZ.

SARMAP was run for a scenario for person in the water, yacht full keel drifting, and vessel debris, from position 4th June 1150 for duration of 460 hours (19 days 4th June to 22nd June). This showed a drift from LKP back towards top of North Island.

SARMAP was again run on 24th June with a life raft included as a possible target. A SAD was developed indicating search area of 160,000 sq nm. This formed the

⁷ At this time RCCNZ only had the position provided by Iridium, the content of this message was still not known, and were not released until 3rd July.

datum for tasking the RNZAF P3K2 Orion search mission being planned for 25th June.



6.5 Alert phase searches

In discussions RCCNZ and the RNZAF – DACCSO, it was agreed that a RNZAF P3K2 Orion aircraft on its way back from Rarotonga could conduct a search for the *Nina*. The P3K2 Orion arrived in the designated search area at 1230 on 25th June, and left the search area at 1708, having covered 281,000 sq nm. There were no sightings of the *Nina*, other yachts were located and identified, VHF radio calls for *Nina* were made on a regular basis and went unanswered.

A second P3K2 Orion search flight was planned for 26th June. The intent was to fly from the LKP along the sailing route to Newcastle, including Lord Howe Island. The plan was that they would cover a swathe of 150 nm each side of the sailing track from the LKP to 50 nm off the Australian coast. The P3K2 Orion commenced the

second search at 1012 on 26th June, reached the Australian side of the search at 1427 on 26th June and returned along the track towards New Zealand. At 1719 on 26th June the P3K2 Orion had completed the trans-Tasman search covering a total of 342,000 sq nm.

At 0945 on 27th June the search was upgraded to Distress Phase

No missions were flown on 27th June; as the weather was not suitable for aerial searching with gale warnings in force.

6.5.1 Observations

The SAROs fulfilled their duties and the requirements of the Alert Phase SOP to a high standard. The information they obtained was relevant, comprehensive and well documented.

The day and night shifts were better engaged, and there was good situational awareness amongst the SARO Teams.
Regular contact with families and friends was maintained.

6.5.2 Opportunities

During the Alert Phase, all the next of kin for the *Nina* crew initiated contact with RCCNZ (22nd to 26th June). It would have been better if RCCNZ had initiated this contact with the NoK. RCCNZ had all the contact details available from the NZ Customs Outward Report. Useful information regarding likely communications and passage intentions would most likely be obtained from NoK.

In the case of the *Nina*, earlier engagement with the crew's NoK could have helped the RCCNZ manage the ever expanding number of concerned friends that were requiring attention.

It should be a procedural matter that RCCNZ make initial contact with the NoK at the start of the Alert Phase or Distress Phase if Distress is declared immediately – e.g. RCCNZ is in receipt of a 406 EPIRB signal or SSB/VHF distress message or visual report of flares etc.

6.5.3 Recommendation

RCCNZ review the SOP Aide Memoires for Alert and Distress Phase to ensure that the notification of NoK has a high priority.

7 Distress Phase – “Grave and Imminent Danger” - 27th June to 5th July

7.1 SAR Convention and RCCNZ SOP – Distress Phase

SAR Convention 4.4.3 - Distress Phase:

- When positive information is received that a person, a vessel or other craft is in danger and in need of immediate assistance
- When following the Alert Phase further unsuccessful attempts to establish contact with a person, a vessel or other craft and more wide spread unsuccessful enquiries point to the probability that a distress exists
- When information is received which indicates that the operating efficiency of a vessel or other craft has been impaired to the extent that a distress situation is likely.

RCCNZ SOP Vol 1 PO1 – Annex PO1-3A – 3 Distress Phase

3.1 The Distress Phase exists when there is reasonable certainty that an aircraft, ship or other craft or persons on board is in **grave and imminent danger and requires immediate assistance**.

3.2 If there is sufficient concern for the safety of a craft and the persons on board to justify search operations, the incident should be classified as being in the Distress Phase.

3.3 For overdue craft, a distress exists when communications searches and other forms of investigation have not succeeded in locating the unit or revising its eta so that it is no longer considered overdue.

3.4 For ships and other craft, a Distress Phase is declared when:

- (a) Positive information is received that a ship or other craft or person on board is in danger and needs immediate assistance
- (b) Following the Alert Phase, further unsuccessful attempts to establish contact with the ship or other craft and more widespread unsuccessful enquiries point to the probability that the ship or craft is in distress
- (c) Information is received which indicates that the operating efficiency of the ship or craft has been impaired to the extent that a distress situation is likely
- (d) The Master of a vessel is of the opinion that his crew are in grave and imminent danger from attack by pirates, armed robbers or terrorists.

RCCNZ would move directly to Distress Phase, on receipt of a signal from a 406MHz distress beacon, receipt of a radio MAY DAY call on VHF or HF radio, or reports of sighting of distress flares. This would be relevant to 3.4 (a) above.

In the case of the *Nina* on 27th June, RCCNZ had been at Alert Phase for the previous nine days with unsuccessful attempts to contact the *Nina*, two extensive searches carried out by RNZAF P3K2 Orion, and the vessel now considered overdue. It was appropriate to move to Distress Phase as for 3.4 (b) above.

7.2 Last known position – Distress Phase

The status for the LKP was carried over from the Alert Phase.

2 nd June 1248 – SPOT -	33° 59's 168° 52'e
4 th June 0939 – Email -	33° 54's 165° 18'e
4 th June 0953 – Text	33° 53's 165° 18'e
4 th June 1150 – Iridium	33° 50's 169° 41'e ⁸

7.3 Contact with Iridium

The first contact with Iridium by RCCNZ was by phone on Saturday 15th June at 1035, where Iridium advised RCCNZ to put their request into an email. An email was sent at 1055 giving details of Bob McDavitt's last contact on 4th June and specifically asked:

"This is the most recent information we have on the phone use and position. We are very keen to receive any updated information as to phone activity and position you are able to provide us"

Iridium responded quite promptly at 1135 with only a position for the last transmission for the *Nina*'s sat-phone at 6/3/13⁹ 23:50 utc as 33.83270°S 169.68940°E.

Iridium had the ability at this time to interrogate their system, discover that the 6/3/13 2350 utc message had not been delivered and been able to have some idea of the message content.

RCCNZ request for activation information was made again on Monday 17th June, with the response from Iridium that there have been no activations.

Now in the Distress Phase, on 28th June RCCNZ sent an email to Iridium requesting information on the use of *Nina*'s sat-phone since 15th May.

On 29th June RCCNZ (possibly out of frustration) telephoned Iridium to determine if their latest email on the 28th had been received by Iridium. Iridium contact responded that email was received and the sat-phone had not been used since the 4th June at 1150.

He then went on to say that he was looking at the data and noted that the *Nina*'s sat-phone had sent the message (4th June at 1150) but it had never been received at the intended destination. He then paraphrased the message content as *"the sails had been stripped and they were drifting"*.

RCCNZ then asked the Iridium contact for position details of all transmissions made between 29th May and 4th June. He replied that he had been looking at these and it seemed to him that the phone headed towards Australia and then turned back towards New Zealand.

Iridium was again requested to provide as much information as they could.

⁸ Content of this message was still not known at the start of the Distress phase

⁹ Dates used by Iridium are presented in mm/dd/yy format, times are utc.

Three hours later (29th 1808) RCCNZ received position information for six transmissions from *Nina*'s sat-phone:

Date / Time utc	Latitude	Longitude
5/29/13 4:32	34.95010°S	173.99030°E
6/1/13 4:37	32.17170°S	174.23260°E
6/1/13 4:44	31.91240°S	159.91100°E
6/2/13 11:33	33.45980°S	167.05950°E
6/3/13 9:41	34.11300°S	161.42390°E
6/3/13 23:50	33.83270°S	169.68940°E

It is indeed unfortunate that all this position information was not provided by Iridium when they were first contacted by RCCNZ on the 15th June, when. Iridium only provided the position of the 6/3/13 23:50 utc call.

RCCNZ still needed confirmation of the contents of the last message. NZ Police were requested to try and obtain that information. The Police were also unsuccessful, Iridium only provided them with the final message position, and that there had been no further calls.

RCCNZ then decided to enlist the help of the US Consulate in NZ. Finally on 3rd July after responding to a request from the US State Department, Iridium released the content of the undelivered 06/313 23:50 message:

Thanks storm sails shredded last night, now bare poles, going 4kt 310deg will update course info @ 6pm.

Content of this message relates directly to circumstances outlined in 3.4 (c):

3.4 For ships and other craft, a Distress Phase is declared when:

(c) Information is received which indicates that the operating efficiency of the ship or craft has been impaired to the extent that a distress situation is likely

If this message had been delivered on the 4th June, issues of concern by the family and friends would have been raised earlier, particularly when no follow up was received at 6pm on that day. It is highly unlikely that they would have waited until 14th June to contact RCCNZ.

Experienced yachtsmen like Curly Caswell and Ted Cary would have realised that the *Nina* could be in severe danger, being under bare poles heading 310°, in a severe storm from the SW - 270°, where she could be beam on to significant breaking seas and swells in excess of 10mts.

Even if this message had remained undelivered but it's contents provided to RCCNZ when they first contacted Iridium on 15th June, then the whole dynamic of the search would have started at another level and the Distress Phase would have been declared much earlier.

7.3.1 Observations

RCCNZ made early and regular contact with Iridium. While Iridium were not fully disclosing all relevant information and were slow to respond, the SAROs maintained their patience and persistence, eventually getting the information they needed. However this took considerable time (19 days) and needed the intervention of the

USA State Department, for the critical information relating to the condition and the safety of those on board *Nina* to be released to RCCNZ.

7.3.2 Opportunities

With regard to the accuracy of Iridium positions there is probably not much RCCNZ can do in a technical sense other than work with Iridium to monitor positions in non SAR situations and gain a better understanding of when and where the inaccuracy occurs.

While an accurate position from a sat-phone call is highly desirable, the details of the time of the call, the person who was called and the message contents are also very valuable to SAR authorities. RCCNZ needs to engage with Iridium and other service providers to explore ways in which information on communications can be provided without having to resort to engaging Police and other authorities such as the State Department. It is understood that other SAR authorities have memorandum of understanding with Iridium and other sat-phone providers.

7.3.3 Recommendations

RCCNZ should engage with Iridium and other communications service providers to set up a memorandum of understanding that would allow timely release of data that would assist a SAR operation.

MNZ/RCCNZ should, through the IMO (Maritime Safety Committee - NAVCOMSAR), and ICAO (IMO/ICAO - Joint SAR Working Group); bring to the attention of the Parties to the SAR Convention; the issues associated with the difficulty in gaining release of data from communications providers to SAR authorities.

7.4 Position Analysis

The Reviewer conducted an analysis of six Iridium positions, four SPOT positions and the text message position sent by Evi Nemeth on 4th June.

The method adopted was a basic “join the dots” exercise using Traverse Table/Mercator Sailing to calculate the rhumb line course and distance between the various positions. Positions used are in degrees° and minutes' of latitude S, longitude E, and have been converted from the decimal degree (DD) convention used by Iridium and SPOT. For example 34.95010°S becomes 34°57'E.

Other positions used in this analysis are for Opua at 35°19'S 174°07'E; a possible way point off North Cape at 34°23'S 173°03'E; Lord Howe Island at 31°54'S 159°08'E and Newcastle at 32°56'S 151°47'E.

7.4.1 Iridium Positions

#	Date/Time NZ	Lat S – Long E	Course Dist Speed	
	29/5/13 1000	35°19'S 174°07'E		Opua
1	29/5/13 1632	34°57'S 173°59'E	343° 23nm 3.5kts	
2	01/6/13 1637	32°10'S 174°14'E	004° 167nm 2.3kts	
3	01/6/13 1644	31°55'S 159°54'E	271° 732nm 7,320kts	
4	02/6/13 2333	33°27'S 167°03'E	104° 374nm 12kts	
5	03/6/13 2141	34°07'S 161°25'E	262° 285nm 12kts	
6	04/6/13 1150	33°50'S 169°41'E	088° 414nm 29.5kts	

Course, distance and speed – is the course and speed that would have been made from the position in the line above

All the messages to RCCNZ from Iridium came with the caveat:

"Please be advised that Geo-location in the Iridium Communications System is accurate to +/- 10km 90% of the time for 90% of subscribers"

Position #1, some 6.5 hours after Nina left Opua is to the NW with a speed of 3.5kts could be considered reasonable.

Position #2 shows a Longitude East of Opua, when the track the Nina would follow was to the NW. This position should be treated with caution.

The remainder, positions # 3, 4, 5, & 6 are truly extraordinary for a yacht that was said to have made its best 24hour speed at 8kts. These could be treated with extreme caution. They could be considered to fall into the 10% of the time for 10% of subscribers category that fall outside the +/- 10kms accuracy.

7.4.1.1 Observations for Iridium positions

Position accuracy determinations for Iridium phone transmissions have some notoriety amongst SAR authorities. Iridium claim a +/- accuracy of 10kms 90% of the time for 90% of subscribers. Clearly most of the transmissions from the *Nina* fall into the 10% outside the 10km range. Up to and before this search RCCNZ had little experience with Iridium sat-phone position information and associated position accuracy.

7.4.2 Spot Positions

#	Date/Time NZ	Lat S – Long E	Course Dist Spd	
	29/5/13 1000	35°19'S 174°07'E		Opua
1	29/5/13 1215	35°10'S 174°08'E	005° 9nm 2.7kts	
2	30/5/13 1145	34°08'S 173°01'E	318° 83nm 3.5kts	
3	31/5/13 1448	33°26'S 171°53'E	306° 71nm 2.6kts	
4	02/6/13 1248	33°36'S 168°31'E	267° 169nm 3.6kts	
	04/6/13 0948	33°54'S 165°18'E	263° 162nm 3.6kts	Text position
	Lord Howe Isl.	31°54'S 159°08'E	264° 479nm eta@4kts	9 th June
	Newcastle	32°56'S 151°47'E	275° 682nm eta@ 4kts	11 th June

Course, distance and speed – is the course and speed that would have been made from the position in the line above

The first SPOT position is close to Opua and consistent with a departure of 1000. #2, just under 24hours later is to the NW of Opua and in the expected direction. Actual distance travelled in that time would be higher due to coastal courses but overall this position is considered quite good.

Position, picked by the Reviewer as a likely way point off North Cape 34°23'S 173°03'E is just 15nm SSE of position #2. This indicates that *Nina* probably would have rounded North Cape at about 0700 on 30th May. Having reached this point a more westerly course would be required. Speed and course from #2 to #3 to #4 are consistent with this. Finally #4 to the position advised by text to Bob McDavitt at 0940 is again consistent with the previous course and speeds.

The eta for Lord Howe Island and Newcastle are made under the assumption of a very good passage speed of 4kts with good weather. No allowance is made for possible delays due to storm fronts etc. Winds in the Tasman in June are mostly from the SW with not much opportunity for fast reaching or downwind sailing. However what was known on 4th June was that *Nina* was hove to in a storm until conditions moderated. The actual weather for the next seven days records several severe storm fronts passing through.

7.4.2.1 Observations for SPOT positions

SPOT is a radio transmitter aligned to the Globalstar satellite system that will send short text messages with an acquired GPS position to pre-programmed destinations. It is similar in size to a standard hand held GPS receiver. It is not a polling device, it needs to be instructed (active intervention by the user) to transmit a message of OK, need help or 911 distress.

SPOT is a comparative newcomer to the New Zealand and Australian marine environment. SPOT claim to have coverage in the Tasman Sea including Australia and New Zealand where they say they have “97% or better probability of successfully sending a single message within 20 minutes”. Questions over its suitability in the marine environment remain.

Curly Caswell in a message to RCCNZ said:

“.....the SPOT in my opinion is a toy when considering ocean passage use and further more Evi had trouble with her SPOT on other passages one being to NZ – you can't say it is a serious method of communications.”

RCCNZ contacted the SPOT operator IERCC and was advised there had been no SPOT communications since 2nd June.

With this background to the SPOT device on board the *Nina*, the decision by RCCNZ to discount the SOPT position of 2nd June is reasonable.

7.4.3 Observations for position analysis

The SAROs conducted an analysis of the various positions available to them by plotting them on an overlay on a marine chart and made their decisions accordingly as time progressed. It was clear to them after receiving, from Iridium on 29th June, the six positions of the *Nina*'s sat-phone, that the Iridium position information should be treated with caution. After this the LKP was weighted towards the crew position sent by text message.

I consider that the method and analysis that I undertook to evaluate the various positions for the *Nina*'s LKP could be a useful method for RCCNZ to incorporate into its SOP. It is not clear to me as the Reviewer if an analysis of the various positions,

similar to that above, was conducted by the SAROs. It is quite possible however that the SAROs conducted a similar exercise by drawing on a marine chart.

The Reviewer's analysis raises deep suspicion on the reliability of the Iridium positions. The SPOT position analysis gives a better correlation with the likely coastal passage and the likely speed that a yacht would achieve under the prevailing conditions.

Allowing a generous 4kts from the 4th June text position gives an ETA at Newcastle of 11th June. The original ETA of 8th June given to Australian Customs was clearly over ambitious needing at least a 6kt average. There was only sufficient fuel on board for about 3 days steaming at 6kts cruising speed, so the intent would have been to sail most of the way. The ETA at Newcastle was recalibrated as 25th June. This would give an average speed of around 2,5kts from the text position which is not considered unreasonable when also taking account of the weather patterns that prevailed in the Tasman Sea during that period.

Overall it is my considered view that the last known position for the *Nina* was most likely the text message position sent to Bob McDavitt on 4th June.

Initially the Iridium position was used for the wide area broadcasts and the earlier SARMAP calculations. The text position was used in later SARMAP calculations. Both positions however were for a location of where the *Nina* may have been some ten days before Ted Cary notified RCCNZ that there were concerns for the vessel and the crew. In the overall search planning effort both 4th June (Iridium and text message) positions were used by the SAROs.

7.4.4 Opportunities

The SAROs would have gained significant benefits in determining the last known position if the SOP had specific guidelines as to how to conduct a multiple position analysis, with a method of grading and ranking these positions. Also a commentary and warning about the accuracy that could be expected from the various communication devices that provide positions as a secondary function is also needed.

7.4.5 Recommendation

RCCNZ needs to provide in the SOP an Annex or Aide Memoir detailing how to best deal with all the issues associated with determining and ranking the Last Known Positions.

8 Contacts with next of kin, family, friends and associates.

Ted Cary and other friends/associates were kept informed by RCCNZ on a regular basis following receipt of the first contact from Ted Cary on 14th June. Ted Cary had advised RCCNZ that he would keep the families of the *Nina* crew advised.

On Saturday 22nd June, RCCNZ received a call from Mikki, partner of Laszlo Nemeth requesting an update. Laszlo is Evi Nemeth's son, the nominated recipient for SPOT tracker messages and identified in the NZ Customs Outward Report as the NoK for Evi Nemeth. Mikki and Laszlo continued to make regular contact with RCCNZ.

On 25th June crew member Kyle Jackson's sister Megan made her first contact with RCCNZ. Following this she made regular contact with RCCNZ

Also on 25th June, Cherie Martinez, twin sister and nominated NoK to David Dyche (owner/skipper of *Nina*) made her first contact with RCCNZ by email. She provided details about the vessel and the engine replacement in Opuia. Cherie now continued to maintain regular contact with RCCNZ and was provided with regular updates.

On Wednesday 26th June crew member Danielle Wright's father Ricky Wright called RCCNZ to discuss the search effort and asked to be included in the email updates.

The British High Commission and the US Consulate in Auckland were advised on the 27th June that RCCNZ held grave concerns for the *Nina* and the crew, with additional advice on RCCNZ action taken so far.

On Thursday 27th June crew member Matthew Wootton's sister Laura called RCCNZ asking for an update. She also advised that Matthew's parents Ian and Sue Wootton were in the USA and asked if RCCNZ could call them. A short time later RCCNZ called Ian and Sue Wootton in the USA. The Wootton family continued to maintain regular contact with RCCNZ.

The next of kin for all *Nina*'s crew members were, from that point, in regular contact with RCCNZ and are provided with regular SITREPs.

On 2nd July Laszlo Nemeth (Evi Nemeth's son), Libby Pratt (Evi Nemeth's niece) visited RCCNZ and were given a comprehensive briefing in the RCC (1530 to 1930). The next day 3rd July Laszlo Nemeth and Libby Pratt accompanied by Andrea Celedon (friend of Matthew Wootton) spent the day (1000 to 1700) at RCCNZ, most of their time being spent in the RCC. Following this meeting in an email to family and friends Libby wrote:

The hospitality and sharing of information provided by NZ RCC has been above and beyond our expectations, we are very thankful for their tremendous work thus far.

On 5th July Laszlo Nemeth, Libby Pratt and Andrea Celedon attended the search review discussion held in the RCC, which led to the decision to suspend the search.

In addition to the families of the *Nina*'s crew numerous friends and concerned acquaintances were in contact with RCCNZ. Each call and email received a courteous response, with an update on the current situation from the SARO on duty.

On Sunday 30th June between 0800 and 2359, RCCNZ received 32 calls and emails from friends and acquaintances (calls and emails from family members are not included in this count), asking for information, or requesting that RCCNZ continue the search. Everyone was provided with a courteous response with the information they requested. This was a noble effort by the SAROs who were also engaged in coordinating a comprehensive air search for the *Nina*. This was an unusual increase in calls and email traffic seeking information. In the nine days spanning 22nd to 30th June, there had been 27 contacts from family and friends.

From the time of the first email from Ted Cary on 14th June through to 5th July when the search was suspended RCCNZ SAROs had responded to requests from 50 individuals identified as being friends and associates of the *Nina*'s crew. This was in addition to the regular contact with the crew's close family members and the USA and UK Ambassadors.

8.1 Observations

What brought about this increase in email and phone calls to RCCNZ from friends and acquaintances around the 30th June is unclear. SAROs need to be vigilant and ensure that all calls and emails are checked; they could contain important new information that could put assurance into the search. None of these calls added new information, mostly they were asking for information which was already being distributed to a network of family and "friends", or they were requesting that the search continue. One would have to wonder if this was an organised campaign. If it was, it served as an unnecessary distraction for the SAROs who were committed and focussed on the search for the *Nina*. The SAROs need to be commended for the patience and compassion in their response to all these messages.

RCCNZ SAROs did a highly competent and professional job in keeping the *Nina*'s crew family member's briefed and informed and their gratitude is reflected in many of the messages received in reply. The SAROs are all committed and passionate about the work they do and were highly disappointed that their effort was not transformed into success.

8.2 Opportunities

A number of SAROs discussed with the Reviewer the unease they felt when discussing the search effort with some of the family members. SAROs need to be able to handle a difficult communication situation with empathy, tact, discretion and clarity. This is especially needed when discussing search effort with the next of kin. Like medical professionals, there are occasions when SAROs will have to communicate bad or unexpected news. There are training programs available for "Communicating in Difficult Situations". RCCNZ should consider making such training available to those SAROs that would like to attend such a program.

The number of enquiries and requests for information coming into the RCC placed a huge workload on the SAROs. Stakeholders who claimed an interest and wanted information outnumbered the legitimate stakeholders by around four to one. In addition to this there were the various "social media" sites where opinions and threads were being developed that were not always helpful or factual. It was almost

a case of “trial by face book”. Some SAROs spoke of frustration that many of these misconceptions were not being corrected.

8.3 Recommendation

RCCNZ and MNZ Media group need to jointly develop a communications plan that will lighten the load on the SAROs from “second tier” stakeholders and handle the ongoing and developing forums in the “social media” environment.

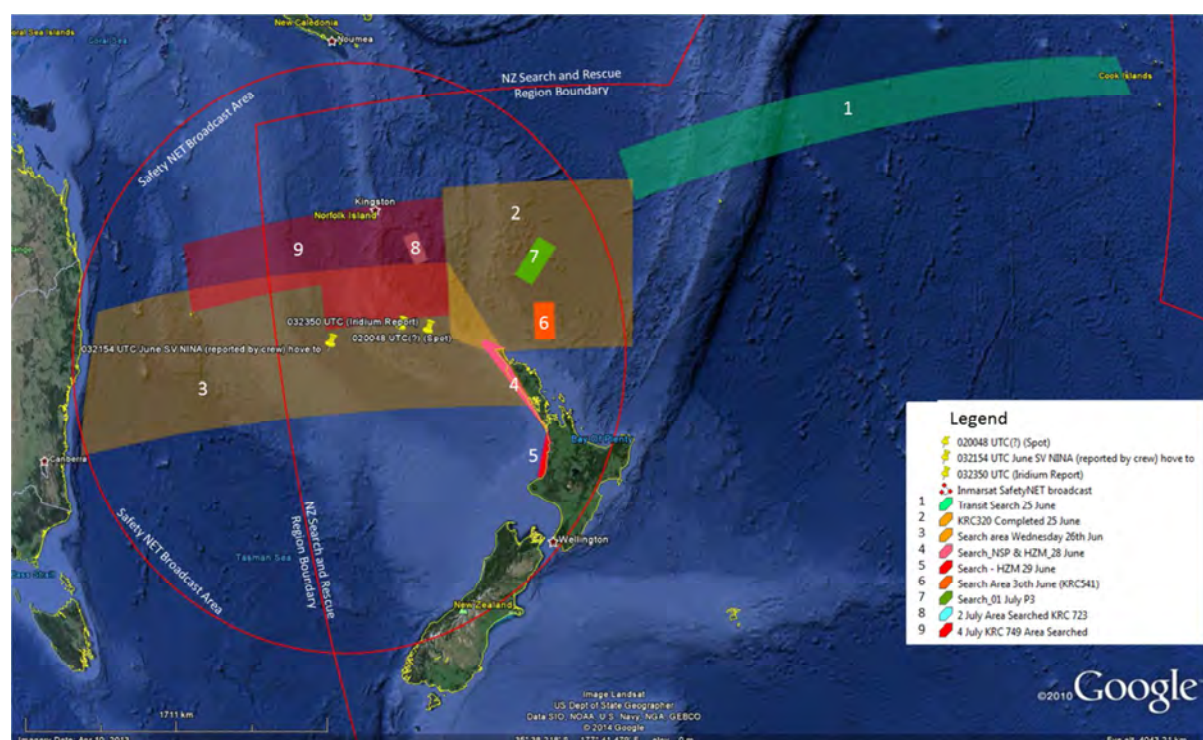
9 Distress Phase Searches

By the time the Distress Phase was declared on 27th June, the RCCNZ had already conducted two extensive P3K2 Orion searches covering some 464,000 sq nautical miles.

On Friday 28th June an extensive fixed wing visual aerial search of the North Island west coast out to Three Kings Island was carried out, with no sightings relevant to the *Nina* being reported.

On Saturday 29th June an extensive visual search of the North Island west coast was carried out by helicopter, again with no relevant sightings.

From Sunday 30th June to Thursday 4th July, extensive P3K2 Orion searches were conducted on each day with the exception of Wednesday 4th July due to inclement weather. Area covered by these visual and radar searches was 131,455 sq nautical miles.



By 2000 Thursday 4th July the RCCNZ had carried out searches involving:

Platform	Mode	Hours	Area sq NM	Date
P3K2 Orion	Radar	8	140,000	25 th June
P3K2 Orion	Radar	7	324,000	26 th June
Piper Chieftain	Visual	8	1700	28 th June
Squirrel Helo	Visual	6	Coastal	29 th June
P3K2 Orion	Visual/Radar	8	4830	30 th June
P3K2 Orion	Visual/Radar	8	3780	1 st July
P3K2 Orion	Visual/Radar	9	2100	2 nd July
P3K2 Orion	Radar	7	120,745	4 th July

Following the searches a number of family and friends questioned the capability of the P3K2 Orion and in particular its radar's ability to pick up a de-masted *Nina* or a life raft. The aircraft had recently been fitted with search capability up grade and the crew were reporting improved performance to RCCNZ. Requests for more technical data about the radar fit out were fielded with the comment that these were military aircraft and the information was classified.

9.1 Observation

The selection of search assets was appropriate. The P3K2 Orion is fitted out to a very high capability. There was a high degree of confidence among the RNZAF air crew and their Commanding Officer that had the targets been there these aircraft would have found them. This confidence was shared by the SAROs and RCCNZ Managers.

The civilian aircraft engaged, fixed wing and rotary were appropriate for their coastal missions. They were crewed by experienced competent crews. RCCNZ had confidence their ability to successfully carry out their mission.

9.2 Opportunities

While everyone had a high confidence in the P3K2 Orion, there was no formal statement of capability in the SOP that SAROs could refer to. It would be useful for the SAROs to have at hand a capability statement, especially as the P3K2 Orion had recently been upgraded.

RCCNZ could work with RNZAF to develop a capability statement for the P3K2 Orion that can be used outside the classified environment of the military. It is understood that much of what is needed in this capability statement is available on the manufacturer's web site. This statement should be subject to regular review.

RCCNZ with the RNZAF could conduct trials with life raft and partially submerged boat to confirm and document the capability of the aircraft when being used in the civilian SAR environment.

9.3 Recommendation

RCCNZ and RNZAF jointly develop a SAR capability statement for the P3K2 Orion to be used by the SAROs in their search planning and be available for dissemination to relevant interested parties.

10 Search Area Determination

All Search Area Determinations (SAD) were calculated using SARMAP in accordance with RCCNZ procedures. RCCNZ software and tables for survival times for immersion in water were used. These reflect current best practice international standards

All scenarios were considered for yacht drifting, yacht no mast, and life raft. Person in the water was not considered as the exposure time from LKP to date of notification was well past the survival time in the water temperature at that time.

Comprehensive summary of SAD for the *Nina* search are at Appendix 15.6

10.1 Observations

Drift modelling and preparation of SADs was carried out before any search was undertaken in accordance with the RCCNZ procedures. Scenarios were discussed and developed recognising the evolving circumstances. While initially the Iridium position was used, in later searches the text message crew position was also used.

Briefings for air crew were comprehensive. In-flight communications were maintained and changes to mission plans considered and implemented as necessary.

Mission debriefs were analysed, and this information was used to plan and brief future searches.

11 Search Suspension - 5th July

SAR Convention - Termination and suspension of search and rescue operations

4.8.1 Search and rescue operations shall continue, when practicable, until all reasonable hope of rescuing survivors has passed.

RCCNZ SOP Vol 1 PO1 – 8 Incident Termination or Suspension.

Chapter 8 of RCCNZ SOP Vol 1 PO1, is comprehensive and detailed, and is reproduced in full at Appendix 15.7

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.

8.1.6.1 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 Suspension of Category II Search Mission Checklist.

The principle mission of any SAR authority is to search for and rescue survivors. In carrying out this task they may find wreckage either stranded or floating, this may assist them in locating survivors; however they are not in the business of conducting salvage or retrieving stranded property.

On the 5th July RCCNZ held a comprehensive review and discussion regarding the suspension of the search. Attending were RCCNZ SAROs and Management, NZ Police, RNZAF, MOC and three family/friends of *Nina*'s crew members. The procedure followed for the suspension review was consistent with the requirements of RCCNZ SOP. Full text of the suspension review outcome is at Appendix 15.8

The key issues are summarised below:

- Last visual contact with *Nina* was when she left Opuia on 29th May bound for Newcastle with an ETA of 8th June.
- The last contact with the *Nina* by sat-phone was on 4th June when the vessel was in heavy seas and strong winds. They were advised to heave to and ride out the storm. This storm was followed by several severe weather systems.
- Friends of the *Nina*'s crew raised their concern with RCCNZ on 14th June.
- RCCNZ commenced SAR action with a communications search, broadcasts to vessels requesting sightings and then aircraft searching from 25th June to 4th July, covering 736,870sq nautical miles.
- Search targets were an intact but possibly damaged *Nina* or a life raft.
- There was a high possibility that a catastrophic event had occurred on or soon after the 4th June.

The search for the *Nina* was suspended at 2040 5th July.

The communications search continued with broadcasts to shipping continuing from New Zealand and Australia until 12th August

11.1 Observation

Having reviewed the SOPs, incident logs, and discussed the operation with stakeholders I am of the firm opinion that suspension of the search on 5th July was justified.

The RCCNZ hypothesis that the *Nina* had succumbed to a catastrophic event on or about the 4th June is considered sound. This was also the view of at least two other highly regarded SAR Authorities outside New Zealand.

The vessel that *Nina* brings to my mind is the yacht *Winston Churchill*. When I had responsibility for RCCAu in 1998, a Tasman Sea storm devastated the 54th Sydney to Hobart yacht race.

Winston Churchill was a classic yacht that had been carefully restored by her owner. She had a long and distinguished Sydney to Hobart record going back to 1945 when she competed in the first Sydney to Hobart race. In the 98/99 race the fleet including *Winston Churchill* were battered by a viscous storm off the east coast of Australia.

The *Winston Churchill* was hove too under minimal sail and engine in 40/50 knot winds gusting to 60 knots with 40 to 50 foot waves. She was knocked down by a huge wave and suffered severe damage and some of the crew were injured. Damage and pressure on the mast had caused the lee shroud to carry away and several hull planks were removed. The yacht was taking water and sinking, the decision was made to abandon to two life rafts. Mayday distress calls were made on VHF and picked up by a media helicopter and the race communications relay vessel. The 406Mhz distress beacon was activated and received at RCCAu.

The nine crew abandoned into the two life rafts taking the 406MHz distress beacon with them. Shortly after taking to the rafts they watched the *Winston Churchill* disappear below the surface. Other than a life jacket with the yachts name written on it, found on a beach twelve months later, nothing else was found.

The two rafts were buffeted by heavy seas and winds during the next 30 hours. Both rafts suffered capsize, immersion and damage on numerous occasions. During one of these tumbling's one raft lost three of its five occupants. The two rafts were eventually found and the six surviving crew were winched to the safety of a helicopter. Had they not been found it is unlikely that the six survivors would have lasted another 24 hours.

The RCCNZ procedure to have a comprehensive review of all action to date before recommending to the MNZ Director that a search be suspended is good practice. The review discussion must be attended by SAR practitioners.

The decision by RCCNZ management to allow family members and a friend of the *Nina*'s crew to be present at the suspension discussion is understood as being intended to demonstrate transparency. Several people informed the Reviewer that they were uncomfortable with the visitors being present. The search suspension

review needs to be attended only by experienced SAR professionals. As the Reviewer I do not support the decision to allow non SAR practitioners to attend the suspension discussion.

The visitors had received comprehensive briefings by RCCNZ, SAROS and Managers on the 2nd and 3rd July. They could have been advised that the review would take place and they would be briefed on its outcome once the MNZ Director had been advised.

The RCCNZ SOP provides guidance regarding access to the RCC during a search, and discourages access by people other than SAR professionals. This part of the SOP needs to be more specific as to when and the circumstances under which people may gain access to the RCC

11.2 Opportunities

RCCNZ procedures for suspension are sound; however there are parts of the procedure that the Reviewer considers raise some concerns in particular:

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 suspension procedures.

8.1.7 Reopening a Suspended Search

8.1.7.1 – If **significant new information or “clues” are developed**, reopening a suspended incident should be considered.

Following suspension RCCNZ in their communication to the family and friends of the *Nina* crew placed emphasis that the search was only suspended and could be reactivated if new information came forward. Even the MNZ Media release of 6th July made the point *“It is possible the search could be reactivated if any significant new information comes to light”*.

This could have possibly generated false hope, and energised the search for new information. No information brought forward after suspension was considered of such significance as to warrant the reopening of the search.

The SOP needs to be more specific as what constitutes fresh evidence and significant new information. RCCNZ should develop an aide memoire to guide SAROs and Managers as what information would be needed to reactivate a suspended search.

The SAROP 8.1 – SAR Action Not Successfully Concluded is specific on two criteria 8.1.2 – Search Termination Considerations and 8.1.4 The Decision to Suspend the Search.

When examined in detail many of the criteria at 8.1.2.1, applied in the case of the *Nina* and were discussed at the Suspension meeting.

However when reaching 8.1.3 – Search Termination:

8.1.3.1 says “*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.....*”.

It continues regarding notifications to all parties, standing down all resources and completing appropriate documentation.

This is confusing, 8.1.3.1 is a statement about what to do when the SAR has been completed successfully; however it is located in a section of the SOP that is titled 8.1 SAR Action not Successfully Concluded.

RCCNZ needs to examine the intent and the detail of Section 8 and resolve the meaning of Termination and Suspension.

It is possible that Termination could apply not only to a successfully concluded search but also to a search not successfully concluded.

Similarly a search could be suspended due to factors such as lack of search resources, interventions of extreme weather and natural disasters flood fire or earthquake impacting on RCC and other land based resources.

11.3 Recommendations

That RCCNZ review and modify the context and intent of SOP Section 8 - Incident Termination or Suspension; to ensure that there is a clear distinction between the SAR definition and considerations for Conclusion, Termination and Suspension. Also what would constitute “new information” to reopen a suspended search needs to be defined.

That RCCNZ review and modify the SOP Section 8.2.2, to be more specific as to the circumstances and time during a search, that persons other than SAR professionals may have access to the RCC

12 Preparation of cruising yachts for ocean voyages

The safety of a yacht and her crew is the sole and inescapable responsibility of the person in charge who must do his best to ensure that the yacht is fully found, thoroughly seaworthy and manned by and experienced crew who have undergone appropriate training and are physically fit to face bad weather. He must be satisfied as to the soundness of hull, spars, rigging, sails and all gear. He must ensure that all safety equipment is properly maintained and stowed and that the crew know where it is kept and how it is to be used. He shall also nominate a person to take over the responsibilities of the person in charge in the event of his incapacitation.

(ISAF Offshore Special Regulation Cat 1 Monohulls – 1.02.1 Responsibility of Person in Charge)

During the review a number of people suggested that cruising yachts leaving New Zealand for overseas destinations could be better prepared. During the discussion the Reviewer had with Ricky Wright and Ralph Baird on 23rd January 2014, Ralph said “*Mariners need to do more to help themselves*”

The International Sailing Federation (ISAF), the world governing body for the sport of sailing, has developed regulations to establish minimum equipment, accommodation and training standards for monohull and multi hull yachts racing offshore. While primarily for racing and enforcement by race organisers, they are also recommended for use and guidance for cruising yachts to consider and adopt.

Yachting Australia (YA) maintain similar Special Regulations for racing yachts that are recommended for cruising yachts. YA Special regulations are the required standard for yachts competing in all classes of the Sydney to Hobart yacht race including the not racing “cruising” category.

Yachting New Zealand (YNZ) maintain Safety Regulation that cover all classes of yachting in New Zealand, which are designed to provide a safe but achievable design and equipment fit out appropriate for the conditions boats can expect to encounter.

Safety inspections are carried out by YNZ appointed Yacht Safety Inspectors, who act under delegated authority from Maritime New Zealand.

A New Zealand registered yacht leaving on an overseas voyage either racing or cruising, before clearing NZ Customs outward would have to undertake an inspection by YNZ Yacht Safety Inspector to ensure the yacht met the requirements for Category 1.

ISAF, YA and YNZ, Category 1 Monohull apply to sailing monohulls operating in offshore races/cruises of long distance well offshore, where boats must be self sufficient for an extended period of time, capable of withstanding heavy storms and prepared to meet serious emergencies without the expectation of outside assistance.

The table below contains extracts from the ISAF, YA and YNZ requirements, while not discounting the importance of construction, stability, rigging, engines, pumps and accommodation, the table focuses on the key communications and safety survival elements of the requirements.

Safety/survival item required	ISAF	YA	YNZ	Nina
Y – yes R – recommended NK – not known				
Inspection by surveyor	Y	Y	Y	
Regular reporting		Y		
Location device	Argos			SPOT
Communications				
GMDSS – Satcom C	R	R		
HF – DSC – fixed installation	Y	Y	Y	
VHF – DSC – fixed installation	Y	Y	Y	Y
Emergency antennae for fixed installation	Y	Y	Y	
Radio receiver for weather	Y	Y	Y	Y
Satellite phone		R		Y
Electronic position indicator GPS fixed installation	Y	Y	Y	Assumed
Man over board alarm	Y			
AIS (Automatic Identification System)	Y	R	R	
VHF - portable	Y	Y	Y	Y
VHF – portable – aviation frequency	Y			
GPS - portable	Y	Y	Y	Y
Radar reflector	Y	Y	Y	
Distress Beacons				
406MHz EPIRB with GPS	Y	Y	Y	NOT GPS
PLB – 406/121 when on deck	R	Y		
Life rafts, life jackets, flares & smokes				
Life rafts to accommodate all crew - SOLAS	Y	Y	Y	8 MAN
Life raft launch capability – 15 seconds	Y	Y	Y	NK
SART (search and rescue transponder)- portable	Y	R		
Life jacket, or PFD for each crew member	Y	Y	Y	Y
Safety harness for each crew member	Y	Y	Y	NK
Distress flares parachute, hand held & smokes	Y	Y	Y	Parachute
Crew Training & Qualifications				
First Aid Certificate – number of crew	2	2	2	NK
Radio Proficiency Certificate – number of crew		2		NK
Sea Safety Survival Training - % of crew	30%	50%	30%	NK
Hull & Sail Marking – Sea Anchors				
Hi visibility storm sails	Y	Y	Y	NK
Hi visibility deck or coach house marking	Y	V SHEET	V SHEET	NK
Hi visibility below water line hull marking	Y			
Drogue and or sea anchor	Y	Y	Y	NK

Regular and reliable communications is one of the keys to making a voyage safer, not only for the owner and the yacht, but especially for the crew. Most ocean race organisers would require as part of their safety standards to have regular radio

reporting of positions by the competitors. By default this practice should be a carryover practice for the cruising yachtsman.

If the *Nina* had been a New Zealand registered yacht she would have been subject to an YNZ inspection before being given NZ Customs clearance to depart from Opuia for Australia. It is possible, even probable that she would not have passed the YNZ inspection; from the table above the key deficiencies are the lack of HF (SSB) radio, radar reflector and distress flares.

12.1 NZ Customs Outward Report (Small Craft)

All yachts leaving New Zealand ports for an overseas destination must be cleared by NZ Customs before leaving. Departing craft are required to deliver the completed Outward Report (small Craft) to NZ Customs not less than 4 hours before departure. Under a local agreement NZ Customs send a copy of the completed form to MOC where it is held on file and can be accessed by RCCNZ.

In addition to information relevant to immigration, customs and excise, the Outward Report has information that is useful to MOC and RCCNZ.

Part C is Crew and Passenger details also giving next of kin details for each person on board

Part D is Craft Details, giving craft details, (size construction colour etc.); engine detail with fuel on board and likely consumption rate; electronic capability on board; and proposed radio schedule that would be maintained during the voyage. Details of life raft, distress flares and other craft on board are also recorded.

The *Nina* completed the Outward Report (Small Craft) at Opuia on 29th May 2013. Departure time was nominated as 1000hrs that day, with the next port being Newcastle Australia. Part C gave the details of seven crew, six being USA citizens and one being a UK citizen. David A Dyche III, signed off the declaration as the person in charge. (A copy of the *Nina*'s Outward Report is at Appendix 15.9)

Within 15 minutes of receiving the first message of concern from Ted Cary (0956 14th June) RCCNZ had contacted MOC and received the NZ Customs Outward Report. Significant information about the vessel was now in the RCC.

12.2 Observations

The system where New Zealand registered yachts proceeding to overseas destinations either racing or cruising, are to be inspected to ensure compliance with a standard developed by YNZ, is an important sea safety initiative and should be continued.

The YNZ requirement for yachts to have a minimum two means of transmitting distress when outside VHF range (line of sight) is in line with requirements for SOLAS and GMDSS. As a minimum any vessel operating beyond VHF coverage should have at least HF radio and a 406/GPS EPIRB.

The NZ Customs Outward Report containing sections with details of key safety equipment carried is a useful source of data for RCCNZ and should be continued.

12.3 Opportunities

When comparing the requirements of ISAF and YA to the YNZ requirements there are a number of key differences especially when considering assistance to SAR. In particular, requirement for regular reporting, wearing a personal locator beacon (PLB) while on deck, and search and rescue transponder (SART) for deployment in the life rafts.

RCCNZ should engage with YNZ to discuss these key items and endeavour to have them included in the requirements, if not mandatory then certainly to be recommended. Greater emphasis should also be placed on the need for comprehensive passage planning, and a communications plan, which includes when and to who regular position reports will be made, covering the whole voyage

Discussions need to be held with NZ Customs and YNZ to review and revise the makeup and content of Part D: Craft Details. As a minimum the fields to be completed by the Person in Charge should reflect the requirements expected for a New Zealand registered yacht making an overseas voyage.

Rather than mandate the requirements for New Zealand registered yachts to apply to foreign yachts, MNZ could conduct an education program targeting overseas yachts calling at New Zealand ports. The concept here from a RCCNZ perspective would be “Help us to Help you”. RCCNZ assisted by MNZ’s media liaison group could develop an education campaign that not only describes the New Zealand SAR system and capability, but outlines the safety fit out that could be expected to be on board a yacht making a voyage outside New Zealand’s VHF radio network. A brochure could be developed and with the assistance of NZ Customs be delivered to each visiting foreign yacht when they clear NZ Customs inward. Hopefully they would take notice and before they get to complete the Outward Report will have rectified any deficiencies before leaving port.

12.4 Recommendations

That RCCNZ in conjunction with Yachting New Zealand review from a SAR perspective the requirements for Category 1 Safety Regulations to ensure that they are meeting world’s best practice. In particular to ensure the need for comprehensive passage planning, regular position reporting, carriage of SART (search and rescue transponder) in life rafts, and for those working on deck in addition to a PFD be required to have a 406MHz PLB.

That RCCNZ in conjunction with NZ Customs and Yachting New Zealand review and revise the makeup and content of NZ Customs Outward Report (Small Craft) Part D: Craft Details to ensure that it reflects the requirements expected for a New Zealand registered yacht making an overseas voyage.

That RCCNZ and MNZ Media liaison group develop an education campaign targeting overseas yachts visiting New Zealand that describes the New Zealand SAR system and capability, and outlines the safety fit out that could be expected to be on board a yacht making a voyage to or from New Zealand.

13 RCCNZ activity post suspension.

Following the search suspension decision at 2040 on 5th July, RCCNZ SAROs went about notifying the next of kin and families. By 1000 on 6th July all relatives of the *Nina* crew had been notified. Everyone was advised that while active searching had ceased the, search could possibly be resumed should significant new information become available to the RCCNZ.

Radio broadcasts to shipping requesting that a sharp lookout, were initially stopped but reinstated soon after. These broadcasts continued until 12th August

On 6th July relatives began calling RCCNZ requesting detailed information on past search activity, asking for:

- All wind and current data from 28th May

- Radar capability of the P3K2 Orion search aircraft

- Search aircraft altitudes, speeds, wind and wave direction, wave heights and photographs of the conditions during the searches

It was decided that all requests for information post suspension would be forwarded from the duty SAROs to RCCNZ Managers (John Seward and Nigel Clifford) for action and response.

13.1 Private search and Texas EquuSearch – drift modelling and searches

On 8th July Ricky Wright began discussions with the other families, proposing that Texas EquuSearch (TES) take on a private search to continue searching in New Zealand waters. He advised *“They have tons of experience and exposure to raise additional funding”*.

14th July Ralph Baird, Senior Advisor TES made contact with RCCNZ¹⁰, advising that TES have been contacted by the families of the *Nina*’s crew to provide advice and possible assistance. He advised that TES were looking to provide funding for further efforts by RCCNZ and the RNZAF. He also requested a contact point.

On the same day John Seward replied to TES, and provided them with details of the search areas, summary of actions taken by RCCNZ and the MNZ media release of 6th July. John Seward was to be the point of contact (PoC) between RCCNZ and TES.

15th July TES wrote to AMSA advising that they intended conducting an air search off the Australian coast Sydney to Newcastle. July 18th TES, using an aircraft out of Canberra, carried out a search off Newcastle that could not be completed due to air traffic control restrictions associated with military air space approaches to RAAF base Williamtown.

These airspace access issues became an issue when TES made complaints to US politicians that RCCNZ was not being helpful. MNZ’s General Manager Safety and Response Services (Nigel Clifford) was asked for answers by the US Consul to NZ. In his response to the US Consul Nigel Clifford advised that:

There has been no contact between the Wrights and the Rescue Coordination Centre New Zealand (RCCNZ) about a private search in New Zealand (NZ) waters and any issues of airspace access. We are also not aware of any

¹⁰ Message detail is at Appendix 15.12

contact between the Wrights and/or their searching agent with the NZ military, the NZ Police or any other NZ authorities. We will make some additional checks to be quite sure.

One possibility is that the Wright's search referred to by the Senator is not in NZ waters but is in Australian waters. This possibility is supported by postings on one of the NINA related Facebook pages showing a planned air search near the coast of Australia. This could be the search that is referred to by the Senator but may not be. I will send you the relevant page for reference.

I suspect that, whether the plan is for NZ or Australian airspace, it may be seeking access to restricted airspace. If so the issues would be with the airspace controlling authorities. For NZ we are happy to facilitate this issue if the airspace is NZ airspace but cannot help if we are not advised of the issue by the search organisers.

19th July: Substantial details and information regarding all searches conducted by RCCNZ were sent to TES In an email to TES Nigel Clifford wrote:

In terms of the current private search activity we are very happy to help in any way we can. At present we have had no information from you on this activity but we understand from media that it is in Australian airspace. We have contacted the Search and Rescue agency in Australia but it seems that they have also had no direct contact with you on this. We would be happy to try and resolve any airspace access issues that you may be having by facilitating contacts with the airspace authorities.

We have always been happy for you to contact us at any time directly to seek any assistance that we can provide. It would be very useful if you and your organisation could act as a single focal point for any requests for information and assistance so that we can keep any confusion to a minimum. You can contact us by voice or e mail at any time using the details below.....

Clearly RCCNZ were quite prepared to cooperate with TES and the private search.

Meanwhile on 20th July TES Ralph Baird is being quoted in sailingsavoirfaire.blogspot as saying:

Unfortunately, when TES works in new geographical areas they have to earn their reputation. The refusal of RCCNZ to be forthcoming with details is frustrating. If Baird's theory is correct, the crew may be in desperate straights. Time is critical for people who are catching rain water and fishing for food. If the crew is in a life raft they are battling hypothermia in the 34 degree water of the Tasman Sea.

New Zealand is using the dance for which maritime search organizations have become famous. RCCNZ now insists Baird go through the U.S. State Department for information. The U.S. State Department says New Zealand is in charge of the search. International law requires Baird talk to RCCNZ. It is outrageous the U.S. State Department and RCCNZ have forgotten what the

names on the crew list represent: Real people with anxious families and the lives of 7 sailors are at stake.

Also on Facebook around the same time:

*I agree NINA is SEAWORTHY - FOR SURE- and the NZ government is making false statements which are only self-serving and destructive and all manipulation by clever agency leaders there. Lets call a spade a spade and get the US State Department moving to help the five (5) families of the seven (7) loved ones. The NZ people won't stand for this either- they can help and our own US Senator and Congressman need to step in here and now –
NOW Ralph Baird, Senior Advisor
TEXAS EQUUSEARCH
TES SV NINA SEARCH FUND, USA*

22nd July: RCCNZ is advised by John Funnell that he has been asked by TES to coordinate any private TES searches from New Zealand. RCCNZ is pleased with this development, they have confidence in John Funnell, who, as a former CEO of Phillips SAR Trust (provider of helicopters for SAR and air ambulance) and current operator of an aviation company has worked with RCCNZ on many occasions. Hopefully the TES/RCCNZ relationship would now be on a better footing.

23rd July: RCCNZ, while in discussion with USCG, are advised that TES have requested access to USCG SAROPS, and should that be declined requested USCG conduct drift modelling for TES. USCG has declined on both counts advising TES that the local SAR authority are best placed for these resources.

Comprehensive detail of all searches that includes planning drift modelling and mission feedback on completion is gathered from the RCCNZ records and collated¹¹. This comprehensive data pack is sent to TES and the families on 25th July. Also included to receive the data are RCCAu, USCG, US Consul and various NZ Government agencies.

Next day 26th July, TES thanks RCCNZ for the package and requires even more details. The trend and tone of the questions are starting to take on the shape of an “inquest” rather than looking for help in conducting a search for survivors.

27th July Ian Wootton questions the possibility of RCCNZ running drift modelling (SARMAP) on previous incidents Rose Noselle 1989 and Scotch Bonnet 2011 to see where the model places them to compare with the actual place they finished up.

28th July TES request RCCNZ to run SARMAP based on a scenario:

*Nina is floating upright without sails or engine power
Use the same LKP that the crew sent; 33 deg 53 min S by 165 deg 18min E.
We would like to see where the Sea currents will take the Nina without wind or wave forces, and without the reported 4 knots at 310 degrees cruising speed.
Please turn the wind and wave and engine components off.
You only need to run this case for two weeks.*

¹¹ Details are at Appendix 15.6

On the same day John Seward responds with two SARMAP data files that RCCNZ believes would be of value to TES. Next day 29th July RCCNZ provides an additional three SARMAP data files.

Having developed more scenarios TES then request RCCNZ to conduct more SARMAP analysis.

With their patience clearly tested RCCNZ (John Seward) politely replies:

Good evening Jerry, (Jerry Borer TES Search Coordinator)

Your request is acknowledged, however, I do not see any operational justification for allocating resources to run your new models.....

Running a new model for the period you have requested will not add value to your considerations.

I regret that I do not see how we can add any further value to your work unless new, substantive, information comes to hand.

Ricky Wright and TES held a lengthy conference call with the USCG on 2nd August. Mr Wright's intention was to convince the USCG to put US resources into the search. TES wanted access to the USCG SAROPS in order to fully analyse the RCCNZ SARMAP data.

USCG explained that RCCNZ had prosecuted the search, by method and effort, in a manner that was consistent with USCG procedures. USCG were of the opinion that a thorough search had been conducted, there was no new information that would warrant a search resumption, and there is no justification for expending additional resources on a further search that has no prospect of success.

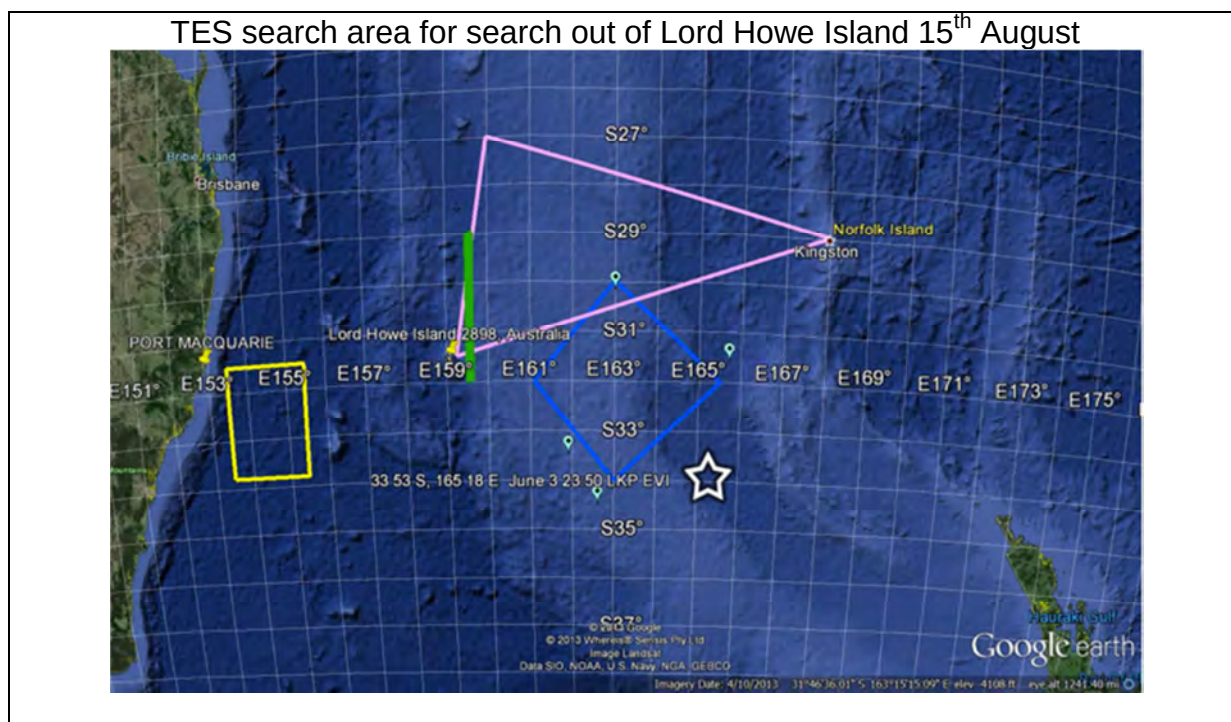
4th August TES's Ralph Baird proposed that new information he has provided warrants RCCNZ resuming the search. TES is suggesting that SARMAP is faulty due to software issues.¹²

7th August RCCNZ responds that the new information is not sufficient to warrant a resumption of the search.

9th August TES makes a formal request to pay for fuel costs and incremental expenses for an RNZAF P3K2 Orion to conduct a search for TES. Same day RCCNZ reply to TES advising that based on the information provided RCCNZ could not recommend to the RNZAF that P3K2 Orion be tasked for either a RCCNZ sponsored search or a private sponsored search.

John Funnell, on 11th August, advises RCCNZ that TES have authorised a Kiwi Air, F406 twin turbine aircraft to transit to Lord Howe Island and commence searching in the Tasman Sea on 15th August weather permitting. Two flights per day are planned to search the blue diamond area.

¹² Details of message is at Appendix 15.12



These would be the first searches TES would undertake from New Zealand.

13.1.1 Observations

Following the RCCNZ decision to suspend searching for the *Nina* the families were clearly upset and this is quite understandable. They began to request RCCNZ to provide a high level of detail as to how the searches for *Nina* had been conducted.

RCCNZ management quite correctly made the decision that in order for the RCC SAROs to continue their regular work on current searches all requests for information and action regarding the *Nina* would be handled by RCCNZ Managers. This responsibility fell primarily on the Operations Manager RCCNZ (John Seward) and General Manager Safety and Response Services MNZ (Nigel Clifford).

In the ongoing management of the issues associated with the *Nina* post suspension; John Seward and Nigel Clifford handled every issue raised and request made; punctually, professionally, patiently, and with the utmost compassion and respect for all those that they dealt with. They should be commended.

It is the view of the Reviewer that other highly regarded SAR Authorities would probably not have serviced the post suspension issues for as long and with the level of support as that provided by RCCNZ.

There should be no opposition to individuals wishing to conduct private searches, and in the case of the *Nina* private searches there was no opposition by RCCNZ. Private searches during a SAR Authority actioned search must be fully integrated into the RCC search to ensure that resources are not in conflict, and effort wasted through duplication. Private searches carried out post termination / suspension need

to be coordinated and managed by experienced SAR specialists with good local knowledge and the backing of latest technology.

Private searches are not common in maritime SAR in New Zealand and Australia. RCCNZ had no prior experience of working with TES. The relationship between TES and RCCNZ did not start well; they did not appear to share the same objective. RCCNZ as with all SAR Authorities search with the objective of rescue and when prospects for survival and rescue are exhausted, the search is suspended. Following suspension they do not search for bodies, debris or derelict vessels. TES appeared to be on a mission of recovery to determine what became of *Nina* & her crew. RCCNZ had been quite forthright post suspension, that if any new information came forward that increased the chance of survival then they would consider resuming the search.

TES comments on Facebook and other web sites were not helpful. If TES were seeking to work in cooperation with RCCNZ their public commentary provides little evidence of their intent. RCCNZ made several offers for TES to come to RCCNZ to be fully briefed on the systems used in the search and the actions taken by RCCNZ. TES did not take up this offer, and it is understood that other than having John Funnell as their in country assistant no one from TES came to New Zealand or Australia during any of the private searches.

TES had no capability to conduct comprehensive drift modelling and search area determinations. Having initially been critical of RCCNZ and their search planning, TES began to develop various scenarios for what may have happened to the *Nina* and then requested RCCNZ to conduct drift modelling and search area determinations for them.

With extreme patience and good grace RCCNZ provided TES with several drift models and search area determinations. The searches flown by TES out of Norfolk Island and Lord Howe Island were all carried out following the provision of RCCNZ drift modelling. The areas had previously been thoroughly covered by RNZAF P3K2 Orion aircraft during the RCCNZ search

13.1.2 Opportunities

The RCCNZ SOP provides no guidance for the interaction and integration of private search organisations or individuals into the search. The SOP would benefit from two guidance chapters, one dealing with the interaction and engagement during the search, and another one dealing with a post suspension private search.

RCCNZ Managers and SAROs need to have a very clear understanding about the level of support and service that would be expected to be provided to individuals or organisations wishing to conduct private searches. It would also allow transparency where the private search could easily determine what resources they would need to bring into their search themselves.

On a number of occasions; RCCNZ invited TES to visit RCCNZ; to be briefed on the searches and techniques used in the search for the *Nina*. TES chose not to take up this offer preferring instead to conduct all dealings and coordination with RCCNZ by email and telephone. This method of conducting search coordination is always going to present difficulties especially if the coordinator has limited local knowledge and is

trying to operate over eight time zones and the date line. The private search would have gained significant benefit by having someone like Jerry Borrer; TES's Search Coordinator visit RCCNZ and work from Wellington during the private search. TES having no drift modelling capability of their own; were heavily reliant on RCCNZ to provide SARMAP / SAD for their search scenarios. Considerable time saving and duplication of effort would have been achieved if the TES Search Coordinator could have had face to face discussions with those who were being asked to provide his SAD.

13.1.3 Recommendations

That RCCNZ develop and publish in the SOPs comprehensive guidance for Managers and SAROs in dealing with:

1. Integration and operation of private searches during RCCNZ active searches.
2. Service provision for and interaction with private search organisations or individuals following termination or suspension of active searching.

13.2 Private search and Texas EquuSearch - satellite images

13th August: Ralph Baird TES contacts RCCNZ John Seward:

We have identified a yacht on a satellite image in the search area close to the Australian coast that we need to be investigated. Jerry's team is working alongside a technical team who has been tasking (moving the focus of the high resolution orbiting cameras) earth satellites of high resolution over the Tasman Sea. I was called an hour ago about this and information should be coming your way to confirm this ship.

Four days later (17th August) RCCNZ John Seward receives a request from TES for drift modeling:

Using a survey of high resolution satellite images from Digitalglobe and Tomnod, we have identified a target that we want our search planes to investigate. We think it may be a life raft from the yacht Nina. Texas EquuSearch and the five families of the missing crew of the yacht Nina would like to request a drift analysis for the following lat/long and time period:

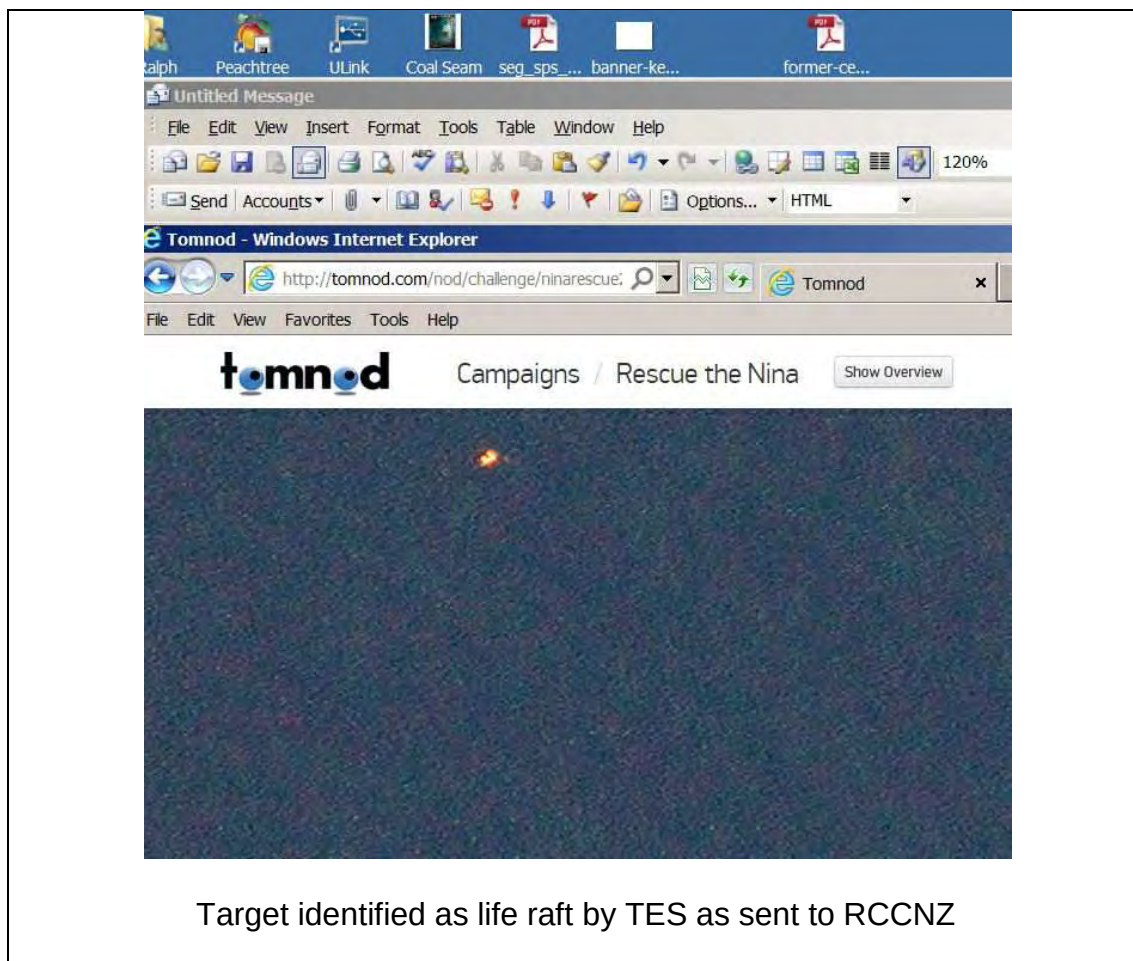
Object: Life raft - type unknown (see the attached image)

Lat/Lon: -28.833728°, 165.800661°E

Time frame: From 2013-08-03 - 23:57:07.932414 GMT To 2013-08-20 23:57:07.932414 GMT

Several hundred volunteers have been looking through daily sets of images sent to us from Digitalglobal/Tomnod. We viewed the attached image today. The date on the image is August 3rd. We are just finding it because of the delays in processing the images and the large amount of images our volunteers have had to work through. I have asked for the analysis to run through August 20 so that we will be able to adjust our plans in case of weather delays.

We have planes ready to fly with SAR qualified crew but we need your drift model to do that.



Within 24 hours RCCNZ responds to TES (Jerry Borrer):

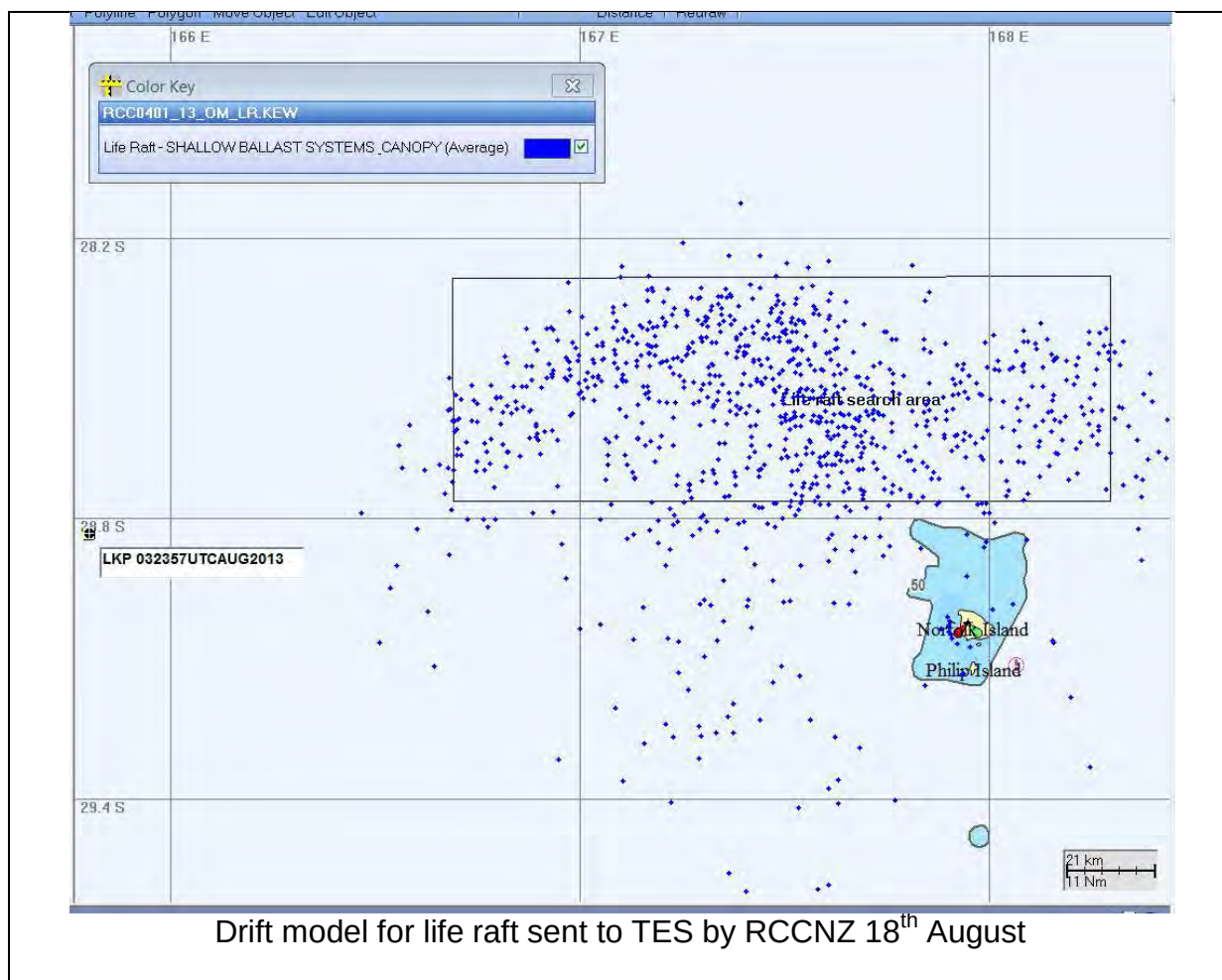
Hello Jerry,

Attached is my drift model that runs from 04 0000 UTC August 2013 to 19 0000 UTC August 2013, based on a life raft with shallow draft and ballast pockets. The area to be searched is clear in the graphic; however, to make it more manageable I have reduced it in size by considering only the areas of higher probability. The coordinates for this 2,500 sq nm area are provided at the end of the attached document.

I am not convinced that the object in the satellite image is a life raft. The image is not clear enough to determine with any confidence just what this object is, however, on the assumption that there may have been something on the surface of the ocean at the location, date and time provided in your email, the information attached should help you investigate what it might be.

Kind regards

John



Full details of RCCNZ Search Area Determination are at Appendix 15.10

It is understood that TES flew a number of sorties from Norfolk Island based on this satellite image. TES did not provide RCCNZ with any mission completed reports on these flights.

25th August TES Jerry Borrer requests more drift modelling from RCCNZ:

We found the attached image on the Tomnod images. Could you run a drift model for us? It is hard to determine, but it has the shape of a sailboat on its side. There also appears to be a mast. We still have planes on Norfolk Island to continue the search. Please run the model based on the following coordinates and time span:

*Lat: -30.17588 Lon: 165.215255
Start Date: 8/6/13 Time: 23:48 UTC
End Date: 8/28/13 Time: 23:48 UTC*

Boat on its side image sent from TES to RCCNZ



John Seward responds to TES Jerry Borrer on 26th August:

Thank you for your email. I have since been informed by your New Zealand liaison officer, John Funnell, that search operations have been suspended because of your concerns about the quality of the images you are using to make your decisions. I also understand the aircraft you have been using is returning to New Zealand from Norfolk Island. On the basis of these developments I will therefore not develop the drift model you have requested.

Requests from TES for RCCNZ drift modelling continue to come in. On 8th September a request for drift modelling is made relating to a satellite picture of a life raft taken on 2nd September.

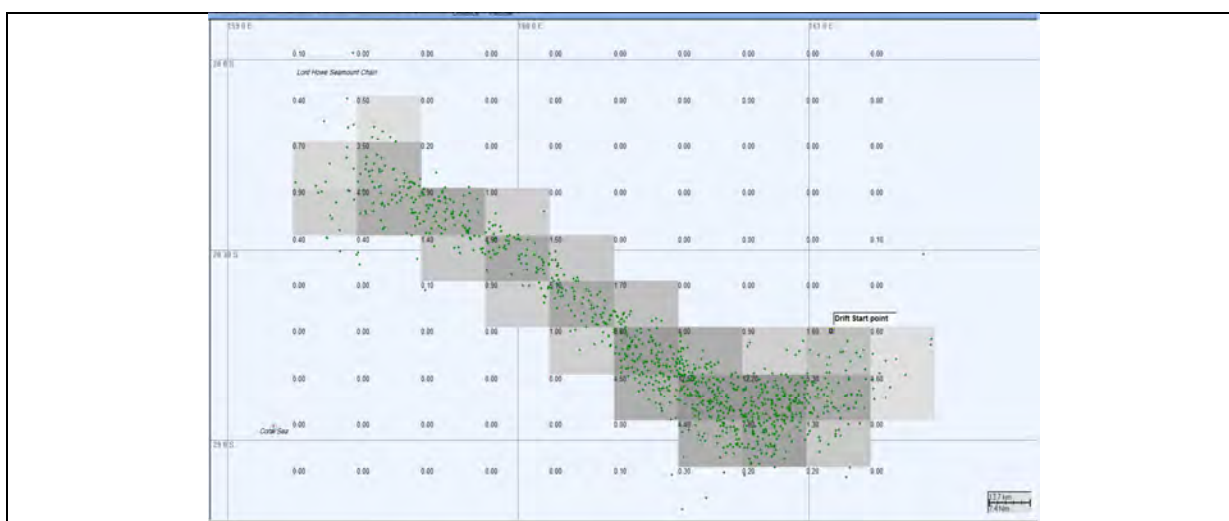


2nd September satellite picture of life raft supplied to RCCNZ by TES

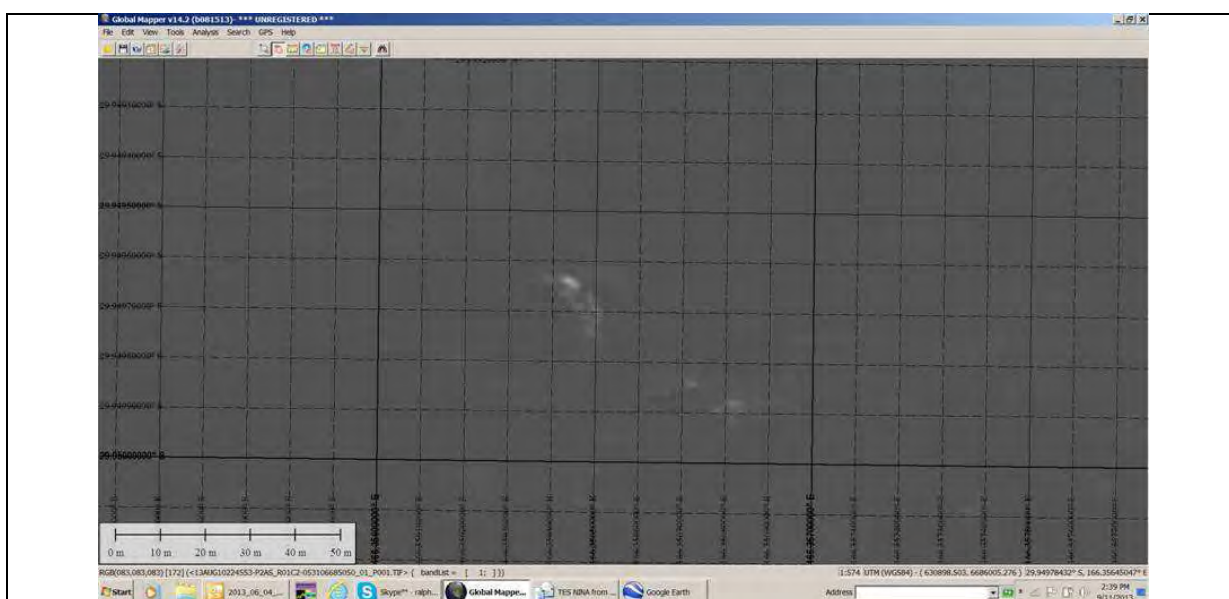
The next day 10th September RCCNZ John Seward provides TES with drift modelling and Search Area Determination for the life raft picture location:

Attached is the SARMAP model you requested. I have left the probability grid in the report so that you can decide which part or parts to focus on in the search area computed by the software (the overall area is nearly 8,500 square nautical miles).

This search area is actually in Australia's Search and Rescue Region, the boundary being on the 163 E meridian.



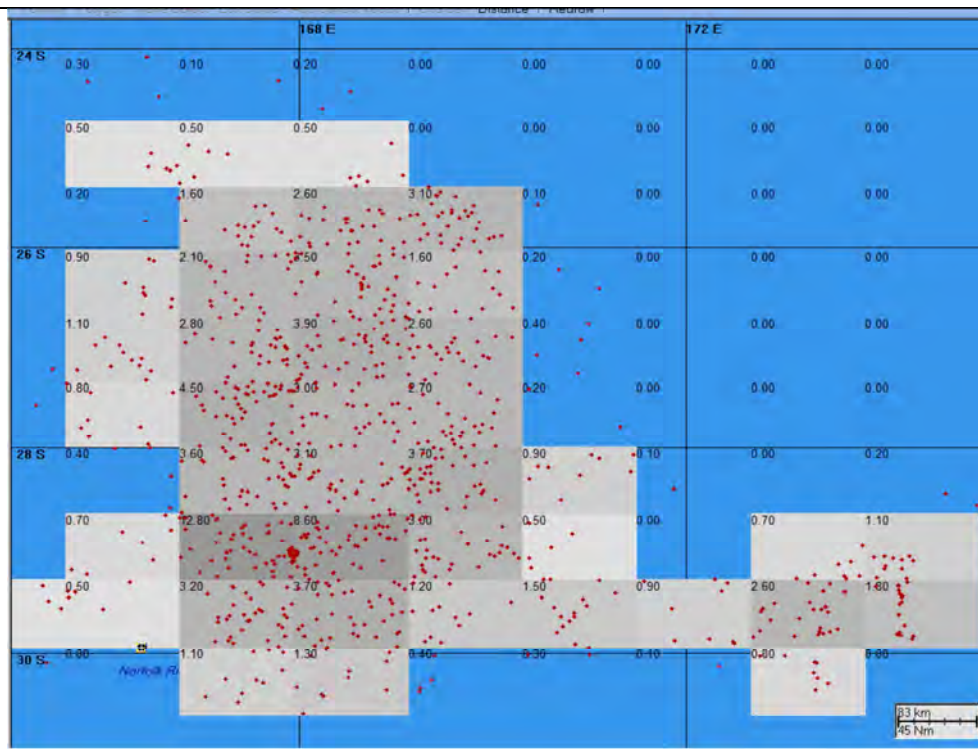
Again TES request drift modelling for satellite image taken one month ago (early August) which TES claim is a vessel similar in size to the *Nina*:



John Seward replies on 12th September with the requested data;

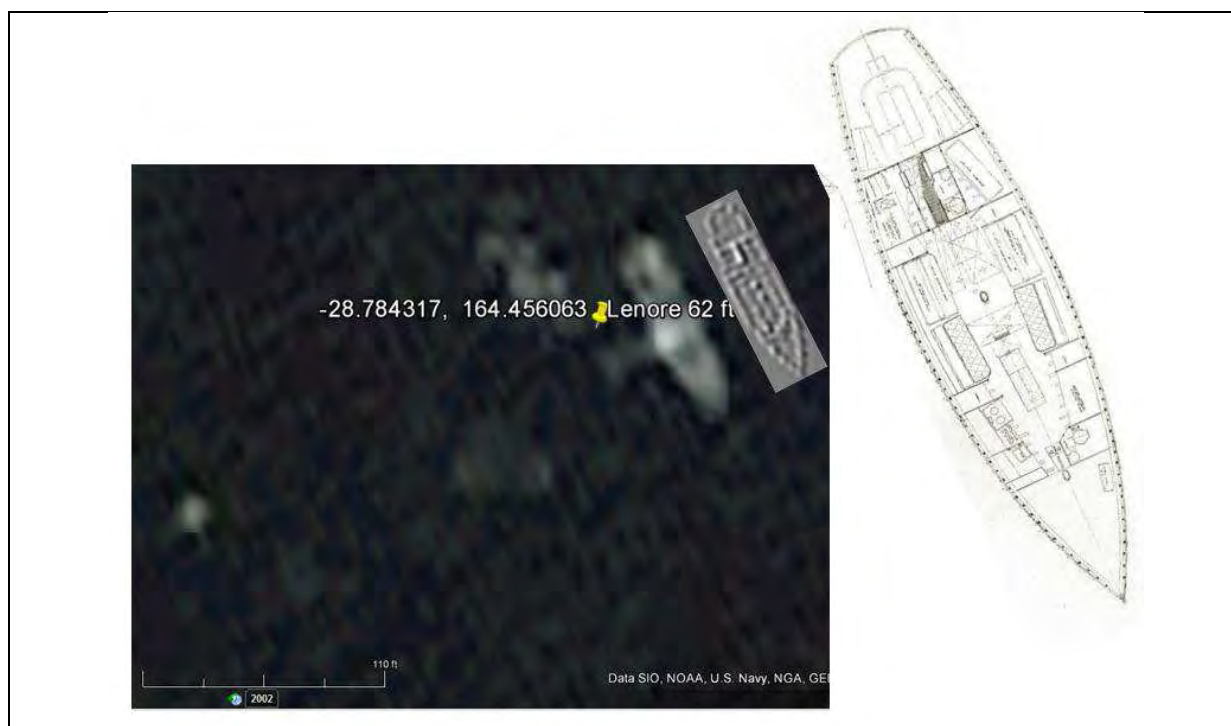
The image attached to your email is not convincing, despite your comments about the USN/Rapier assessment of what it represents. Nevertheless, attached is the drift model you have requested.

Considering the time that has elapsed since the NINA was last heard from and in the absence of new, verifiable, information in regard to the NINA and its crew, we are having increasing concerns about the resources required to help TES and will be reviewing whether continued support from RCCNZ is justified.



Drift model and SAD by RCCNZ for TES 12 September

More satellite images are sent to RCCNZ that TES claim to be the *Nina*. One is overlaid with a schematic of the *Nina*:



Copy of the TES “Object C” Lenore 62ft pictures are at Appendix 15.11

RCCNZ decide to enlist NZ Defence specialists to analyse the satellite images being provided by TES. The specialists obtain original data from the satellite image providers. Advice provided to RCCNZ is that the objects in the satellite images are not the yacht *Nina*.

Nigel Clifford informs TES and the families of the outcome of the specialist analysis:

Email text of 24th October:

As per your requests and as promised in my e mail response of 15 October, RCCNZ has reviewed the images provided to us by TES which were accompanied by a request to consider these as ‘new information’ and as sufficient evidence to consider re-commencing the NZ authorities search for the SV Nina.

The review of the images has been comprehensive and thorough. Through a partnership arrangement with New Zealand Defence Force specialists, full copies of the original images have been obtained (the images sent to us were not in the original format and there were some losses of resolution in those images). The images have subsequently been analysed by technical specialists in the field of satellite imagery analysis.

The conclusion is that the resolution of the images is insufficient to draw an unequivocal determination of the identified feature but, after exhaustive analysis, it is considered very unlikely that the object is the SV Nina. Shadow and highlight details of the object have been compared to known points on the SV Nina and there is little or no correlation.

I am sorry that I cannot offer a more positive outcome but given this specialised analysis of the original images RCCNZ remains of the view that there is insufficient justification in these images to support renewed active searching by New Zealand authorities.

The email exchange between the families and RCCNZ management continue, requesting that RCCNZ reconsider the image and seeking verification of how the expert analysis conducted for RCCNZ was conducted.

Robyn Wright wrote to Nigel Clifford on 30th October:

Mr. Clifford,

The families of the missing Nina crew are preparing to pay for another private search to find the drifting boat found using satellite images, known as the Lenore boat taken on September 16th (attached). Please confirm that this precise image was analysed by professional specialists who concluded that it is extremely unlikely that this image specifically is of Nina. Please put us in touch with the specialists as we would very much like to see exactly how that determination was made. Your immediate response will help us with future decisions in how and where we search, and would be most appreciated. Our funds are being depleted, and the last thing we want to do is waste valuable time and money

Nigel Clifford replies

Robin,

Thank you for the e mail and the attached letter.

I can confirm that the image analysed in detail here in New Zealand was the same image that you sent to us and was the 'full resolution' commercially available one. I have passed onto you already the key points of the technical assessment as relayed to me. I have, however, gone back to see if there are any more details. (GEOINT response is at Appendix 15.13)

There were no more requests for drift modelling or new satellite images brought forward to RCCNZ by TES or the families.

13.2.1 Observations

The satellite images provided to RCCNZ during the private search presented three significant challenges for TES and RCCNZ.

The first problem was the time the image was taken to the time it was provided for consideration. In many cases this was over 30 days. Like the LKP, the shorter the time from the LKP to when the SAR Authority is notified the better chance there is of finding the target. This is where a GMDSS 406MHz distress beacon when fitted with GPS capability and activated, will advise the SAR Authority of a distress; with a position having accuracy of 120mts; within an hour of the beacon's activation.

The second issue was the clarity of the images. Satellites providing the images were generally operating in the "commercial" sphere. These commercial operators have no market for pictures taken over open ocean, particularly the Tasman Sea. As a consequence their cameras and radars are tuned to the terrain where their clients require higher definition and this is usually over land. Satellites can be reprogrammed to look in other areas, but this is time consuming and expensive to organise. With random events like SAR it is unlikely that reprogramming satellites' field of view and clarity would achieve the desired outcome.

The third issue concerns the analysis of the images. As TES found there were thousands of images to be scanned and analysed, all needing the intervention of the human eye to determine whether the image was of interest to the search for the *Nina*. The process used by TES was through Tomnod, a project owned by Colorado-based satellite company DigitalGlobe that uses crowd sourcing to identify objects and places in satellite images. Once the images had been through the Tomnod process TES brought them to the attention of RCCNZ as being new information that required reactivation of the search. RCCNZ engaged NZ Defence experts to analyse satellite pictures provided by TES. None of this analysis could provide a conclusive opinion that the images were the *Nina*. It is interesting to note that with all the analysis that was applied to the satellite images for MH370 none of it was conclusive that the images were definitely parts of the aircraft. Extensive searching by the best assets available, which included RNZAF P3K2 Orion, failed to find any of the objects identified in the satellite images.

An excellent technical report on this subject, written by Joseph M. Hellerstein and David L. Tennenhouse titled “Searching for Jim Gray: A Technical Overview” outlines some of the difficulties and technical challenges faced with the use of satellite images in the search for Jim Gray and his sloop *Tenacious* off the US west coast in 2007. (Technical Report No. UCB/EECS-2010-142 which can be found at <http://www.eecs.berkeley.edu/Pubs/TechRpts/2010/EECS-2110-142.html>) Issues and challenges in this search were similar to those encountered in the search for the *Nina*.

13.2.2 Opportunities

In carrying out this Review I have not become aware of any satellite imagery, sourced by a SAR Authority, or images that have been provided by others, as a primary, secondary or tertiary source of intelligence; that have provided a key lead to a successful marine SAR event.

There is a body of work that needs to be done in order for the Maritime SAR community to gain confidence and understanding as to exactly what satellite imagery can bring to solving SAR equation. The possibilities are endless.

Perhaps as a starting point RCCNZ could engage with others in the region to conduct trials in the Tasman Sea where known targets are looked for by using the current satellite systems available. Using this data a directory could be built up that compares the satellite image with possibly an aerial photograph of the target.

Using the lessons learned from the *Nina* search this issue should be raised at the IMO/ICAO forums. RCCNZ should sponsor a paper to the IMO/MSC/NAVCOMSAR raising the issue of using satellite imagery in SAR. Likewise the same principle and application could be taken to the IMO/ICAO SAR Working Group. With International support coming from these forums, a comprehensive analysis and evaluation can be undertaken to establish how satellite imagery can assist with maritime SAR.

13.2.3 Recommendation:

That RCCNZ raise the issues associated with using satellite imagery in the search for the Nina at the IMO and ICAO SAR forums to gain International support for the conduct of a comprehensive analysis and evaluation of how satellite imagery can assist with maritime SAR.

That RCCNZ consider, in conjunction with Regional SAR partners, conducting a trial in the Tasman Sea where known targets (preferably yachts) are further identified using satellite imagery.

13.3 Ongoing Private Search January 2014

On 13th January 2014 TES's Ralph Baird contacted RCCNZ with a picture of a life buoy beacon and requested that RCCNZ consider this new information:



Same day John Seward responds to TES:

We learned about it this morning from the New Zealand Police and investigated the report. Following is the reply I sent to the Police:

Thank you very much for contacting us. The photos you sent of the Life Buoy Light have been compared with an image, taken on 10 May 2013, of a similar device fixed to the NINA's stern rail – they are not the same shape. The

Outward Report for NINA does not mention a “Life Buoy Light” or similar device and it is considered unlikely that more than one would be carried. On that basis it is considered most unlikely that the Life Buoy Light recovered from the west coast of Northland came from the NINA.

Manufacturer is not identified on the unit but the brand is likely to be Sunpower. Serial No 06810. It is more likely to have come from a fishing vessel and it is not uncommon for these devices to come ashore in NZ. There is no justification for further work on this.

This was the last communication between TES and RCCNZ.

There were no more private search missions conducted in the NZ SRR. In January 2014 Ricky Wright conducted flights from Gladstone Australia searching some of the southern islands of the Great Barrier Reef.

Ricky and Robyn Wright were in New Zealand in January 2014. They visited RCCNZ on 23rd January and received a comprehensive brief in the RCC. Following this brief they had a meeting with myself as the Reviewer, also connected into this meeting by “Skype” link were Ian and Sue Wootton and TES’s Ralph Baird.

14 Submissions to the Review by the Families of Nina's crew.

Following the visit to RCCNZ by Ricky and Robyn Wright and the meeting with the Reviewer, RCCNZ decided to invite the other families of the *Nina*'s crew to consider making a written submission to the review. RCCNZ requested the families; that if they could; to coordinate their thoughts and submit a combined submission.

The families, jointly, made two submissions to the review, the first one in March 2014 and a second submission in April 2014, following the loss of aircraft MH370 en route from Kuala Lumpur to Beijing on 7th March 2014.

As the Reviewer I would like to thank the families for making submissions to this review. Where ever possible I have used information provided in the submissions in the review. The submissions asked many questions and those that fell within the scope of the Terms of Reference are addressed in the report. Some of the issues raised in the second submission made comparisons to the search for MH370, these are addressed below.

14.1 MH370 – SAR coordination

The initial LKP for MH370 was in the Malaysian SRR in the South China Sea. Later The LKP moved to the Malacca Straits still in the Malaysian SRR. Malaysia had responsibility for coordinating the search. When the information from Inmarsat (engine performance data transmissions that were not disabled) became available the LKP moved to the Southern Indian Ocean. Although the LKP was now in the Australian SRR, Malaysia still had SAR Coordination as outlined in the ICAO/IMO Conventions.

The Malaysian Government **requested** the Australian Government to take over the SAR coordination for MH370. This was agreed by the Australian Government and RCC Australia became the SAR Coordinating Authority.

Once the point was reached where there was no chance of finding survivors from MH370, RCC Australia withdrew. The search, which was now for wreckage and the "black box", which was needed to determine what had happened to MH370, was taken over by the Joint Agency Coordination Centre (JACC) operating out of Perth Western Australia.

14.2 SAR assets in the MH370 search

New Zealand Government **offered** the Malaysian Government a RNZAF P-3K2 Orion to assist in the search for MH370. The Malaysian Government accepted the New Zealand offer and the RNZAF P3K2 Orion was deployed and worked under the coordination of RCC Malaysia, RCC Australia and the JACC.

Australia, China, USA and many other nations offered search assets to the Malaysian Government that were accepted and worked in the search for MH370.

14.3 Satellite Images used in search for MH370

Numerous satellite images were obtained, analysed and with confident predictions as to what they represented were provided to SAR Coordinators for search consideration. Numerous missions were flown, using assets with the same capability

as those that searched for the *Nina*. Many ships searched the ocean surface. Despite the early confidence that the satellite images had found the MH370 wreckage, the best maritime search assets have not been able to find any trace of MH370 on the ocean surface.

14.3.1 Observations

Parties to the SAR Conventions set up their SAR systems to meet their Convention responsibilities. New Zealand like many other parties to the Convention (Australia, Canada, USA, and Malaysia are some) have sufficient capacity to respond to SAR events in their SRRs without having to request assistance of others. However, if a competent SAR Authority offers assets or assistance it is highly likely that it would be accepted and integrated into the search.

Within the convention requirements there is provision for Parties to promote consultation and provide technical assistance for States requesting, training of personnel and provision of equipment and facilities necessary for search and rescue. (SAR Convention Resolution 8 – Promotion of technical co-operation). Generally SAR Authorities will have in place agreements with other Parties that have adjoining boundaries to their SRR.

New Zealand has in place SAR Cooperation Agreements in place with Australia, New Caledonia, Fiji, USA, and Chile.

For Tonga, Samoa and Cook Islands, these Nations are located in the NZSRR. NZ has arrangements in place with these countries to provide specific SAR services.

The search for MH370 and the use of satellite images demonstrated how difficult it is to use this technology to successfully prosecute a maritime search. A significant body of work is required before this technology will be a reliable resource in maritime search. As with the *Nina*, the critical issue for the MH370 search was the time difference between the time the image was taken and when it was determined conclusive enough for search assets to be deployed to the scene.

15 Appendix

15.1 Parties consulted during the review

Maritime New Zealand Managers

Nigel Clifford
Keith Manch
Lindsay Sturt

RCCNZ Staff

Keith Allen	Chris Henshaw
John Ashby	Greg Johnston
Kevin Banaghan	Geoff Lunt
Neville Blakemore	Conrad Reynecke
Rodney Bracefield	Mike Roberts
Paul Craven	John Seward
Ramon Davis	Dave Wilson
John Dickson	Christine Wilson

MOC – Kordia

Brendan Comerford

NZ Police

Geoff Logan

RNZAF

Cameron Brownlee

RCC Australia

John Young
Allan Lloyd
Debra Galwey
Barbara Pearson

Family and Friends

Robyn and Ricky Wright
Sue and Ian Wootton (by phone)

Other stakeholders

Bob Mc Davitt – Weather expert (by phone)
John Furnell – Private Search NZ coordinator
Ralph Baird – Texas EquuSearch (by phone)

15.2 *Nina*'s crew details and NoK

From NZ Customs Outward Report

Crew Member	Nat	NoK	Place
David Dyche III	USA	Cherie Martinez	USA
Rosemary Dyche	USA	Cherie Martinez	USA
David Dyche IV	USA	Cherie Martinez	USA
Danielle Wright	USA	Ricky Wright	USA
Kyle Jackson	USA	Amy Jackson	USA
Evi Nemeth	USA	Laszlo Nemeth	USA
Matthew Wootton	GBR	Ian Wootton	GBR

From United States 406MHz Beacon Registration

Owner	Vessel	Emergency contacts	Place
David Dyche III	<i>Nina</i>	1 Cherie Martinez	USA
		2 Kevin Donovan	USA

From SPOT tracker

Owner	Nat.	Data recipient	Place
Evi Nemeth	USA	Laszlo Nemeth	USA

15.3 MOC – Taupo Marine Radio - Kordia details

Marine Operations Centre (MOC) - Taupo Marine Radio

Maritime New Zealand is responsible for maintaining VHF and HF radio services for New Zealand's coastal waters and the South Pacific. As well as providing around-the-clock monitoring of VHF and HF distress channels.

Maritime New Zealand also broadcasts safety information, such as meteorological warnings, navigational warnings and ionospheric prediction warnings. Warnings are broadcast at set times of the day or anytime warnings come to hand.

The region covered by the New Zealand Distress and Safety Radio Service is known as NAVAREA XIV. This region extends from mid-Tasman to mid-Pacific and from Antarctica to the Equator. It covers 12.5% of the earth's ocean surface.

The maritime distress radio system is a radio network and operations centre dedicated to issuing weather and navigation warnings and handling distress and safety radio calls within the NAVAREA XIV radio coverage region.

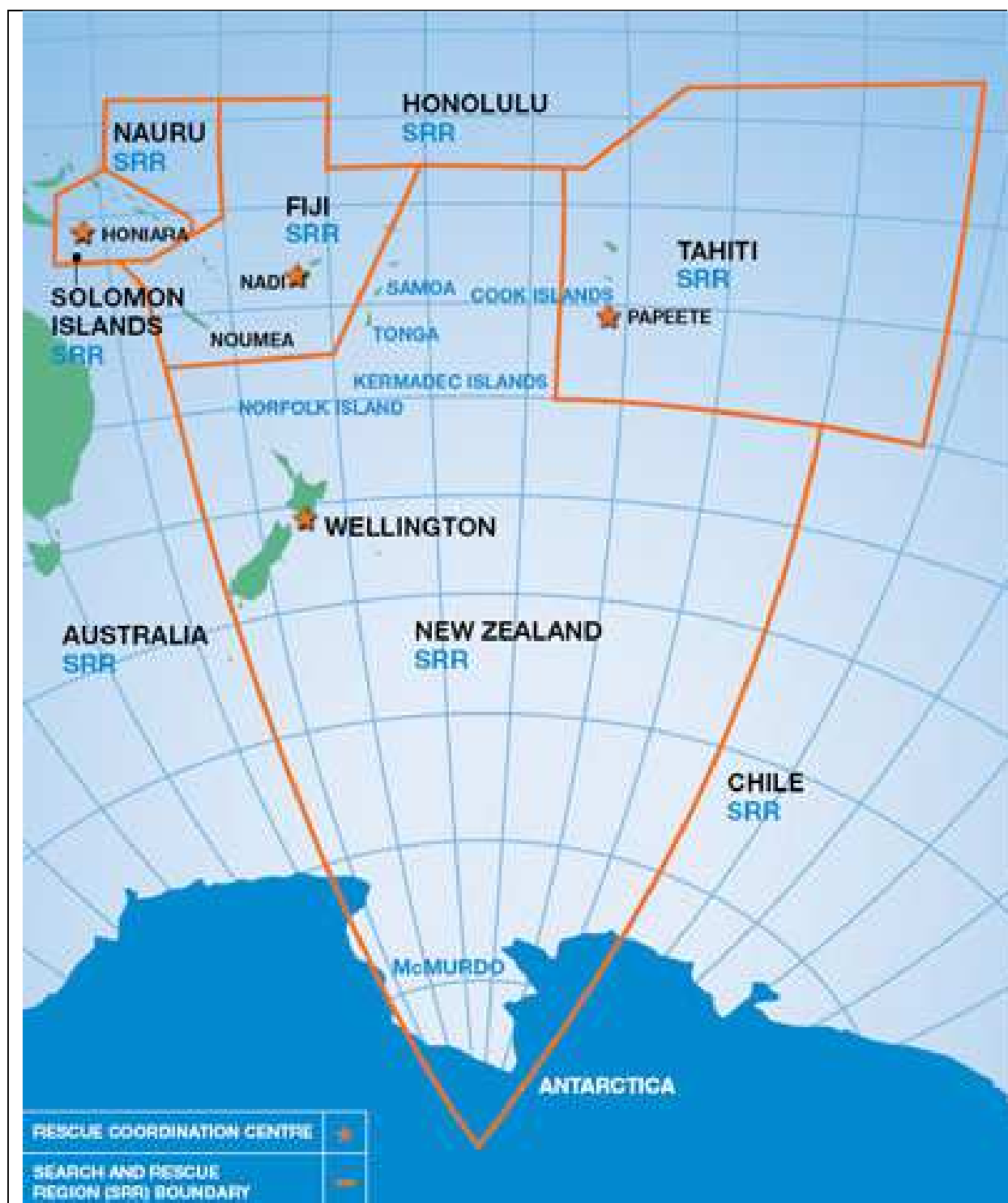
The network is a series of radio stations that are tuned to maritime frequencies and linked to Maritime New Zealand's Maritime Operations Centre (MOC) in Wellington. The Maritime Operations Centre also passes information to the INMARSAT satellite system.

The Maritime Operations Centre has trained radio operators who keep a 24-hour watch of all the stations in the radio network. The operators will respond to distress calls, handle trip reports and broadcast safety information.

They assist the Rescue Coordination Centre of New Zealand (RCCNZ) with communications. RCCNZ co-ordinates all major sea, air and land search and rescue missions within the New Zealand search and rescue regions.

Maritime New Zealand owns and maintain one third of the maritime radio network. The remainder is provided for and maintained by Kordia.

15.4 NZ Search and Rescue Region Chart



15.5 SARMAP description

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:

1. **Automated Manual Solution (AMS)**, from the International Aeronautical and Maritime Search & Rescue Manual (IAMSAR), IMO, 1999. - or
2. **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 objects' 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.

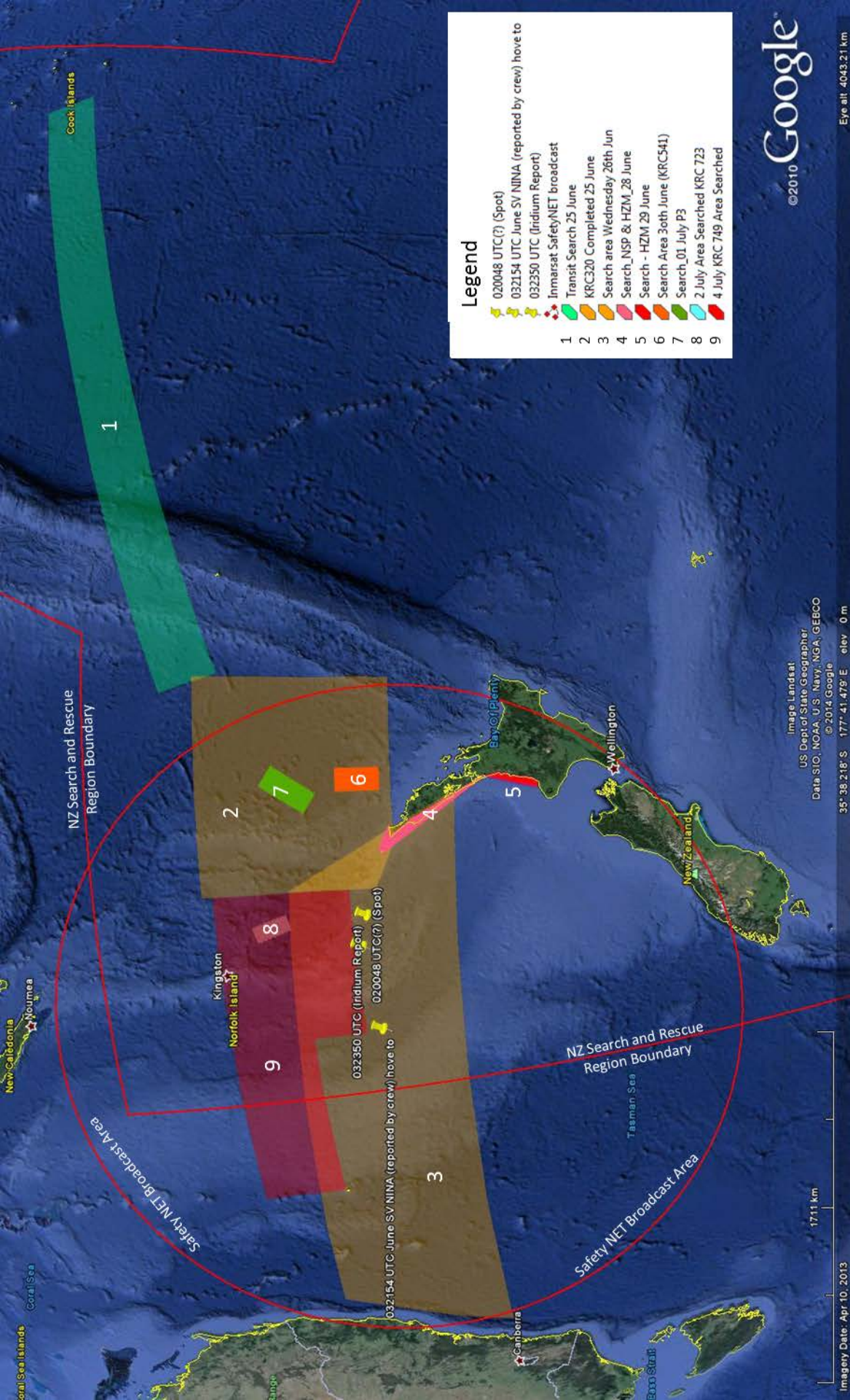
SARMAP also includes an embedded Geographic Information System (GIS). The GIS is used to store, display and analyze any type of geographically referenced data. Types of data often included in the GIS are place names and navigational aids.

These data are not necessarily used by the model, but they are often helpful in analysing 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.

15.6 SAD summary of searches

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SAD summary starts on next page.



RCC0401/13 SV Nina Brief



CODE	RCCNZ
OWNER	RCCNZ
AUTHORISED BY	General Manager Safety and Response Services
ISSUE DATE	24 July 2013
VERSION NUMBER	1

1. Purpose

To provide details of the aircraft radar and visual searches coordinated by the Rescue Coordination Centre New Zealand (RCCNZ) during the Search and Rescue Operation (SAROP) for *SV Niña* and her seven crew.

2. Definitions

RNZAF – Royal New Zealand Air Force

3. Scope

This brief provides details on all the individual sorties flown by aircraft during the SAROP. Each mission flown is detailed in terms of the decisions that informed the search, the Search Area Determination (SAD) and the search data that resulted from the search.

4. 25 June 2013 Search Effort

4.1 Decisions that informed the search

RCCNZ determined to commence active aerial searching. A P3 orion aircraft of the RNZAF was available to undertake search activity on its return to New Zealand from an earlier, non-related SAR mission in the Pacific Islands. RCCNZ tasked the aircraft to undertake a two-part search. The first part was a high-level radar search conducted during the transit from the Pacific Island (Rarotonga) to the specific search area.

This transit search served two key purposes. Firstly it provided an opportunity to assess the efficiency of the aircraft radar in detecting objects both smaller and of similar size to *SV Nina*. Secondly it would allow the aircraft to check on an earlier sighting they had made of a vessel of similar description to *SV Nina* en route to their SAR task in Rarotonga. In the event this sighting was able to be eliminated prior to the transit as the vessel was confirmed to not be the *Nina* and now to be to the northwest of Rarotonga.

The second part of the mission was the main search for that aircraft sortie. The search area to which the P3 was tasked was based on the possibility of the vessel being in a drifting condition from from a Last Known Position but unable to make way or communicate since 4 June. Other possibilities that were considered but not targeted during search operations for 25 June were:

- a) Vessel still making way towards Australia, but significantly delayed due to weather and unable to communicate, and
- b) Sudden and catastrophic event on 4 June resulting in crew either abandoning to the life raft or directly to the water, or unable to escape the vessel.

Due to the limited available time-on-task, priority was given to searching for a drifting vessel.

4.2 Search Area Determination (SAD)

RCC0401_13_DW_3 – appended at Appendix 1 (LKP based on Iridium data).

Search area corners:

35 38.77 S 170 46.4 E

28 31.87 S 170 46.4 E

28 31.87 S 178 29.64 E

35 38.77 S 178 29.64 E

4.3 Search Data

Wind 270 T @ 5 kts - Sea State 1

MISREP

High level transit to search area – reported all tracks detected enroute - on task at 250030 z – Radar search creeping line ahead with N/S legs advancing to the W – 80 nm track spacing based on 40 nm detection of wooden hulled yachts – altitude between 500 and 900 ft depending on cloud – all vessels detected were investigated to determine type and similarity to Nina – all vessels determined as not of interest – after 3 legs track spacing increased to 160 nm based on detection of similar sized vessels to Nina – off task at 250518 z

Completed area bounded by 28 29 s 170 44 e / 33 54 s 170 44 e / 34 32 s 172 28 e / 28 30 s 178 30 e / 34 29 s 178 29 e - assess 100% radar coverage within this area - broken layer of CU throughout

Large number of yachts located NE of search area – several within search area – all contacts reported – no sign of Nina or any similar vessel - good visual conditions below cloud layer – SECURITE calls made regularly – very good radar performance throughout

Channel 16 comms attempted with Niña regularly without success

Flight time 11 hours

5. 26 June 2013 Search Effort

5.1 Decisions that informed the search

The planned search was based on the possibility that the vessel was still making way towards its original destination in Australia, but was significantly delayed due to weather and unable to communicate.

The RNZAF was requested to undertake a track-line search with outward bound leg 80 miles south of the track-line between the LKP and Newcastle, and the return leg 80 nm north of it in order to give maximum coverage over the search area.

5.2 Search Area Determination (SAD)

RCC0401_13_DW_5_TL - appended at Appendix 2 (LKP based on Iridium data).

5.3 Search Data

Weather – broken cloud 3-4 thousand feet. Sea state 2-3 increasing to the west

MISREP

Departed 252048 z – ontask 252149 z – offtask 260520 z – landed 260612 z Flight time 9.4 hours

Completed track search from Cape Reinga to LKP 35 50 s 169 41 e to Niña destination 32 56 s 151 46 e – radar coverage 60 nm either side of track from Reinga to LKP and 120 nm either side of track from LKP to destination. Radar coverage did not extend within 50 nm of the Australian coast.

Assess good radar performance based on contacts sighted. Several small fishing contacts investigated until positively identified –one small target investigated at 34 04.0 s-164 19.1 e but two passes made with nothing seen and no radar contact regained – Lord Howe Island investigated – advised by Lord Howe Radio that previous two weeks weather had been “non-stop atrocious” – advised by Lord Howe that 2 vessel had been deployed for the day to search the local area for the Niña.

Channel 16 comms attempted with Niña regularly without success.

Flight time 9.4 hours

6. 28 June 2013 Search Effort

6.1 Decisions that informed the search

Drift modelling showed that should Niña have suffered a catastrophic incident there was a possibility that debris could have come ashore on the Three Kings Islands or on northern New Zealand. These areas and down the west coast of northern New Zealand were tasked to be searched visually by a Piper Chieftain (ZK-NSP) from Phillips SAR Trust.

Late in the day a report was received from a member of the public that a piece of wreckage had been found on the beach near Port Waikato and a helicopter equipped with NVG and a Nitesun was tasked to investigate

6.2 Search Area Determination (SAD)

RCC0401_13_DW_7 appended at Appendix 3 (LKP based on Iridium data).

6.3 Post Search Data

ZK-NSP search tracks appended at Appendix 4

All coastal areas searched – nothing seen in relation to yacht debris or life raft – clearly saw fishing lines/buoys/birds on surface The fixed wing search undertaken over two flights with a refuelling stop between

The yacht wreckage reported was sighted by the helicopter and found to have been ashore for 2-3 years. The helicopter also landed at two other sites to investigate sightings but found nothing connected with this incident.

Flight time 8.1 hours – fixed wing

2.4 hours - helicopter

7. 29 June 2013 Search Effort

7.1 Decisions that informed the search

Decision made to re-cover the areas searched by the helicopter the previous evening in the dark but this time in the daylight. The Piper Chieftain was tasked but suffered an electrical fault meaning it was unable to fly so the Squirrel helicopter used for the previous night search was tasked in its place.

7.2 Search Area

Coastline search from Port Waikato south to New Plymouth, with return journey just offshore.

7.3 Post Search Data

Weather – wind 160 T x 3 kts – Viz 25 kms – Sea state calm

Low level coastline search – search speed- remote coastline 50 kts – populated coastline 70 kts – no Niña wreckage found

Flight time 3.7 hours

8. 30 June 2013 Search Effort

8.1 Decisions that informed the search

Offshore searching undertaken thus far has concentrated on searching only for a drifting yacht and while there was a chance that a liferaft might have been able to be detected this was not the objective of these searches. The fact that the vessel had not been found on the surface with good search conditions over a vast area of ocean led RCCNZ to believe the search should now be primarily for a liferaft. RNZAF calculations for visual liferaft search advised that with an endurance of 8 hours on task, a sweep width of two miles and a speed of advance of 200 kts would allow a search area of approx 3200 sq nm. A SAD was calculated and the highest probability area achievable in the time available passed as the tasking to the P3.

8.2 Search Area Determination (SAD)

Search Area corners:

34 10.73 s 174 23.55 e

32 51.38 s 174 23.55 e

32 51.38 s 175 09.10 e

34 10.73 s 175 09.10 e

RCC0401_13_CH_1 and RCC0401_13_CH_2 run with positions 50 nm N and 50 nm S of LKP to compare possibilities - appended at Appendix 5(LKP based on Iridium data).

8.3 Post Search Data

Weather: Cloud 2000-4500 ft – wind 130 T @ 13 kts – Viz 40 km – sea state 0-1

MISREP

Airborne 291905 z – ontask 291943 z – offtask 300405 z – landed 300445 z

100% of tasked area completed at 1000 ft with a track spacing of 2 miles – assess coverage as excellent due environmental conditions – visual ranges assessed as better than search tables due to sightings of yachts and fishing vessels in area

Investigated numerous floating objects all assessed as not connected with vessel wreckage

Channel 16 comms attempted with Niña regularly without success

Flight time 9.7 hours

9. 1 July 2013 Search Effort

9.1 Decisions that informed the search

Search planning for the 30th of June had indicated an area of high probability which was searched without success. Further SARMAP determinations were run with calculations for the possible drift of a liferaft and the area of highest probability once again selected that was able to be searched by a P3 with normal operating endurance and this area was provided as the tasking for the P3 and was searched by line of advance.

9.2 Search Area Determination (SAD)

RCC0401_13_CH_5A appended at Appendix 6(LKP based on Iridium data).

Search Area corners:

30 31.3 s 174 38.7 e

30 54.3 s 175 20.0 e

32 09.7 s 174 21.8 e

31 46.4 s 173 40.8 e

Additional area completed: 31 46.4 s 173 40.8 e / 32 09.7 s 174 21.8 e / 32 14.0 s 174 18.3 e / 31 50.8 s 173 37.3 e

9.3 Post Search Data

Weather: wind 120 T @ 5 kts – Viz 30 km – nil significant weather – nil turbulence – scattered cumulus 3000/4000 ft – 1 m SE swell – sea state 1

MISREP

Tasked area covered with addition of small extra area to the south – nil objects sighted throughout the search – several merchant and fishing vessels operating close to area – Two smokes dropped for calibration purposes – smoke drift 102 T/0.9 kts over three hours – several visual biological sightings supporting assessment of sound visual search conditions

Channel 16 comms attempted with Niña regularly without success

10. 2 July 2013 Search Effort

10.1 Decisions that informed the search

In light of the updated information provided by Iridium concerning position accuracy issues, new SAD's run using the LKP as passed by crew. The modelling showed that there was considerable overlap with the areas already searched for a drifting vessel but also identified two areas which merited further investigation. The P3 was tasked to search these. Primary visual and secondary radar searching with 2-3 mile track spacing was requested. The aircraft flew a line of advance search pattern based on this request.

Search area 1 corners:

29 57.9 S 169 34.6 E
31 03.2 S 169 58.2 E
31 10.9 S 169 29.3 E
30 05.6 S 169 05.8 E

Search area 2 corners:

30 30.6 S 165 00.7 E
31 25.1 S 167 11.2 E
31 53.3 S 166 55.2 E
30 58.5 S 164 44.9 E

10.2 Search Area Determination (SAD)

RCC0401_13_V2_CH_CREW_LKP - appended at Appendix 7(LKP based on 'crew' data).

Only search area 1 could be covered because of the available endurance of the P3 search aircraft.

10.3 Post Search Data

Weather: 050 T @ 25-40 kts – Viz 15 km haze – Few scattered stratocumulus – primary swell NW @ 2 m / secondary NE 1.5 m – sea state 4

MISREP

Airborne 1800 z / ontask 1930 z / offtask 0420 z / landed 0535 z

100% of area one completed plus four legs to the W – area covered 29 57.9 s 169 34.6 e / 31 03.2 s 169 58.2 e / 31 12.0 s 169 34.6 e / 30 07.0 s 169 58.2 e

Track spacing reduced to 1.2 nm to ensure effective coverage due to weather – nil significant sightings in area one.

Channel 16 comms attempted with Niña regularly without success

Flight time 11.6 hours

11. 4 July 2013 Search Effort

11.1 Decisions that informed the search

Using an LKP derived from the crew data models were run to consider drift to the north of that LKP over the elapsed time. The area resulting from this work also covered a second small area not searched in the mission on 02 July (Search Area 2 under the 2 July entry)..

The size of the 4 July area meant it could not be 100% searched visually for a life raft. To optimise the use of the P3 the profile requested was for a radar search of the whole area looking for a drifting vessel and a visual search of the small area not searched on 02 July.. In addition the search area was further extended to including the Middleton and Elizabeth Reefs to the west to cover the possibility of the vessel, liferaft or debris having been washed up in those locations.

11.2 Search Area Determination (SAD) – (LKP based on crew data).

The coordinates for this area are:

A. 29 26S 158 59E

B. 2926S 170 45E

C. 31 26S 170 45E

D. 31 26S 158 59E

These coordinates were determined after considering a new SAD versus the areas already searched. There were overlaps but there were areas that had not previously been searched. These coordinates were selected to provide the required coverage. An area considerably greater than that bound by the coordinates was in fact covered by the searching aircraft, as detailed in the mission report details below.

11.3

Post Search Data

MISREP

Airborne 032052 z / ontask 032215 z / offtask 040500 z / landed 04 0656 z

Area covered bounded by positions 33 04 s 170 45 e / 33 04 s 165 16 e / 31 26 s 165 16 e / 31 26 s 158 59 e / 28 49 s 158 59 e / 28 49 s 170 45 e

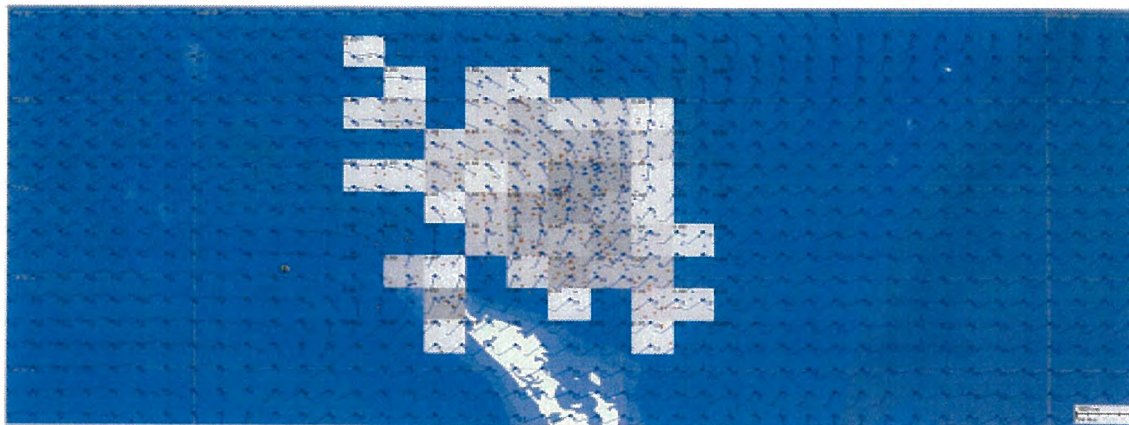
Radar search primary and visual secondary – Poor weather and viz required 1500 ft search in E half of area however radar and visual search not compromised – W half of area searched at 2500 ft – sea conditions throughout assessed as having nil impact – Sea state 3 in E and sea state 1 in W – sensor performance assessed as very good throughout search – 2 objects sighted floating in vicinity of Elizabeth Reef assessed unrelated to Niña – several old wrecks observed on Elizabeth and Middleton Reefs.

Channel 16 comms attempted with Niña regularly without success

Flight time 10.1 hours

APPENDIX 1:

TELEPHONE: +64 4 577 8030
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EMAIL: rccnz@maritimenz.govt.nz



24/06/2013 23:30:00

Search 31 Jun NZST

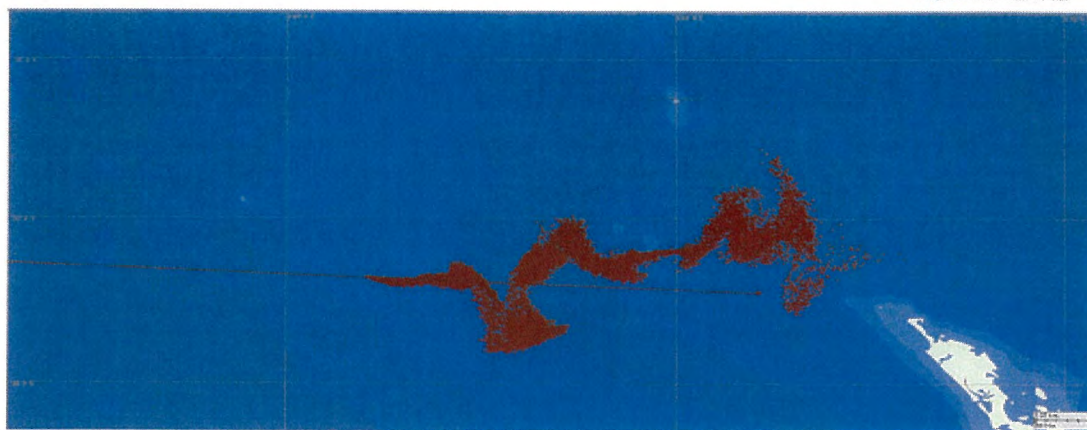
Incident	RCC0401_13_DW_3
Description	NINA
Drift Start Time	3/06/2013 23:30:00
Grid File	NZSRR SHP
Current File	RCC0401_13_DW_3_HYCOM_GLOBAL_NC
----- SEARCH OBJECTS -----	
Search Object1	Life Raft - NO BALLAST SYSTEMS - (Average)
Wind Factor	0.042
Leeway Divergence	28
Wind Adjustment	0.031
Search Object2	Sailing Vessel Mono-hull, FULL Keel - DEEP Draft
Wind Factor	0.03
Leeway Divergence	48
Wind Adjustment	0
Drift Error	0.30
Safety Factor	1.10
Fix Error	5.00
----- SEARCH AREA -----	
Prediction Time	24/06/2013 23:30:00
Predicted SAR Area (NM)	180922.73
A	35 38.77 S, 170 46.4 E
B	28 31.57 S, 170 46.4 E
C	28 31.57 S, 178 29.64 E
D	35 38.77 S, 178 29.64 E
Centre point of Area	32 S 32 S, 174 38.02 E

Rescue Coordination Centre New Zealand
Fax: 04 5778038

Form: RCCOPS-018

APPENDIX 2:

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25/06/2013 11:30:00

Incident	RCC0401_13_DW_5_TL
Description	SV NINA
Drift Start Time	3/06/2013 23:30:00
Grid File	NZSRK SHP
Current File	RCC0401_13_DW_5_TL_HYCOM_GLOBAL_NC

----- SEARCH OBJECTS -----

Search Object	Sailing Vessel Mono-hull, FULL Keel - DEEP Draft
Wind Factor	0.03
Leeway Divergence	48
Wind Adjustment	0
Drift Error	0.30
Safety Factor	1.10
Fix Error	0.50

***** SEARCH AREA *****

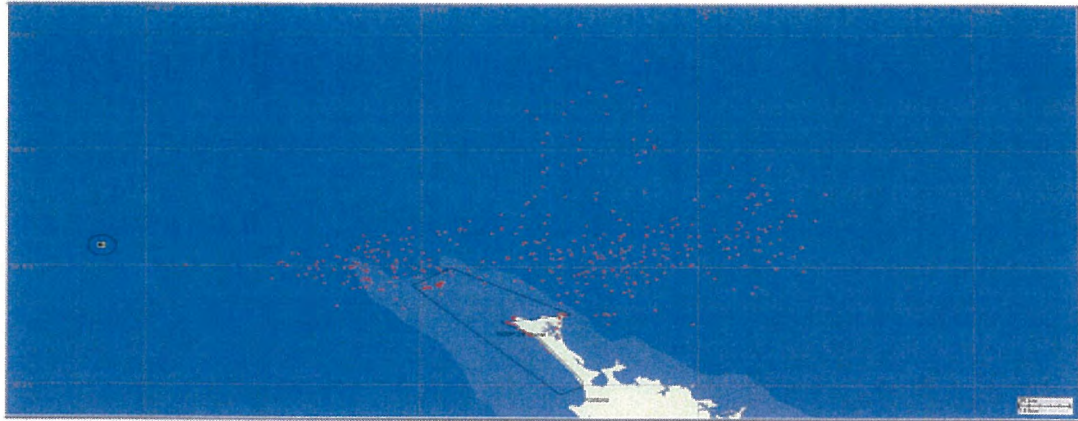
Prediction Time	13/06/2013 23:30:00
Predicted SAR Area (NM)	163958.71
A	38 17 53 S, 161 36 56 E
B	38 17 18 S, 161 36 56 E
C	38 17 18 S, 172 44 41 E
D	38 17 53 S, 172 44 41 E
Centre point of Area	32 47 34 S, 167 10 49 E

Rescue Coordination Centre New Zealand
Fax: 04 577 8038

Form: RCCOPS-018

APPENDIX 3:

TELEPHONE: +64 4 577 8030
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28/06/2013 23:30:00

Incident	RCC0401_13_DW_7
Description	NINA
Drift Start Time	3/06/2013 23:30:00
Grid File	NZSRR SHP
Current File	RCC0401_13_DW_7_HYCOM_GLOBAL1.NC

----- SEARCH OBJECTS -----

Search Object1	Boating Debris - F/V debris
Wind Factor	0.02
Leeway Divergence	10
Wind Adjustment	0
Drift Error	0.30
Safety Factor	1.10
Fix Error	5.00

***** SEARCH AREA *****

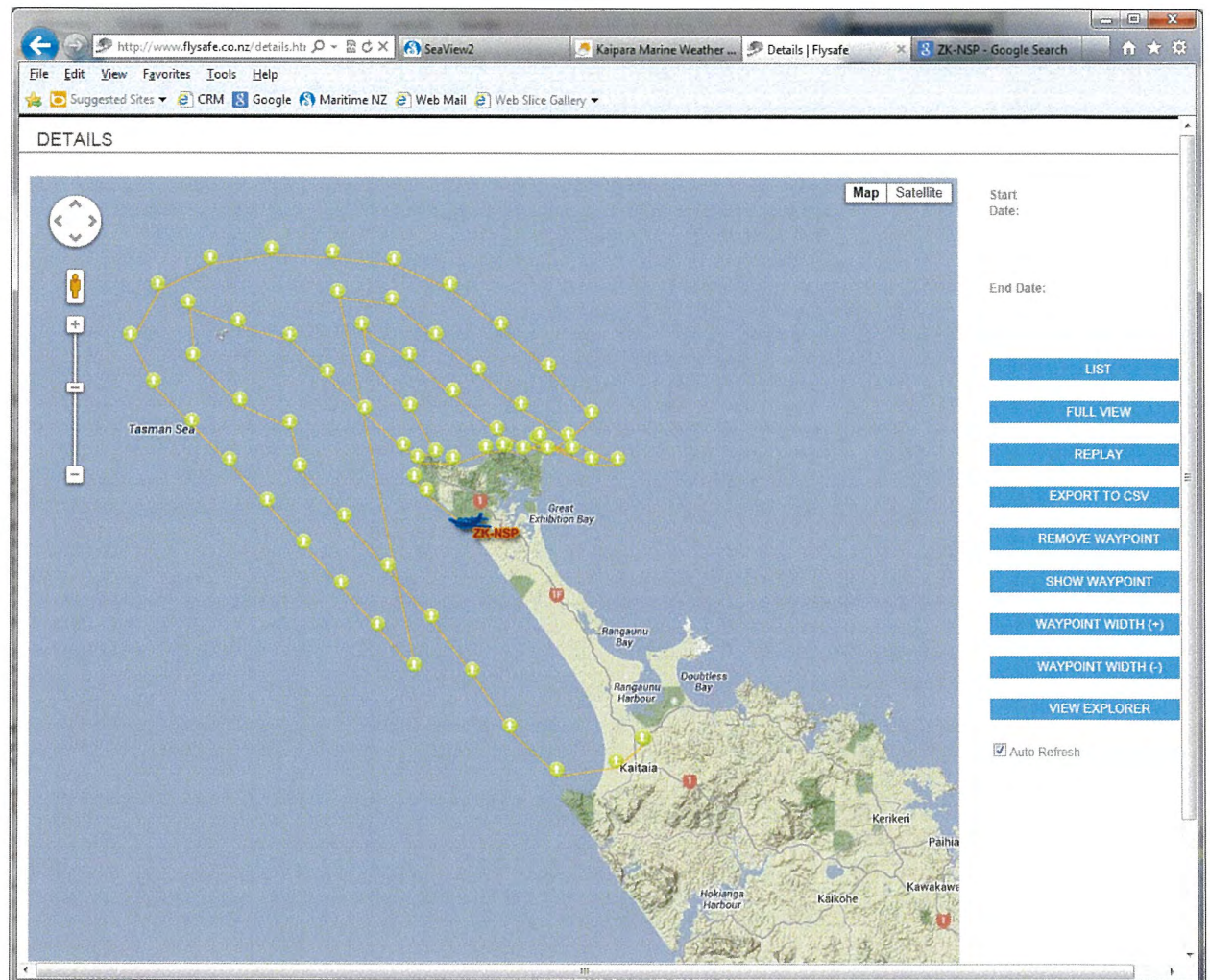
Prediction Time	28/06/2013 23:30:00
Predicted SAR Area (NM)	40494.38
A	34 44.39 S, 170 17 02 E
B	31 46 45 S, 170 17 02 E
C	31 46 45 S, 174 56 76 E
D	34 44 39 S, 174 56 76 E
Centre point of Area	33 16 44 S, 172 36 69 E

Rescue Coordination Centre New Zealand
Fax: 04 5778038

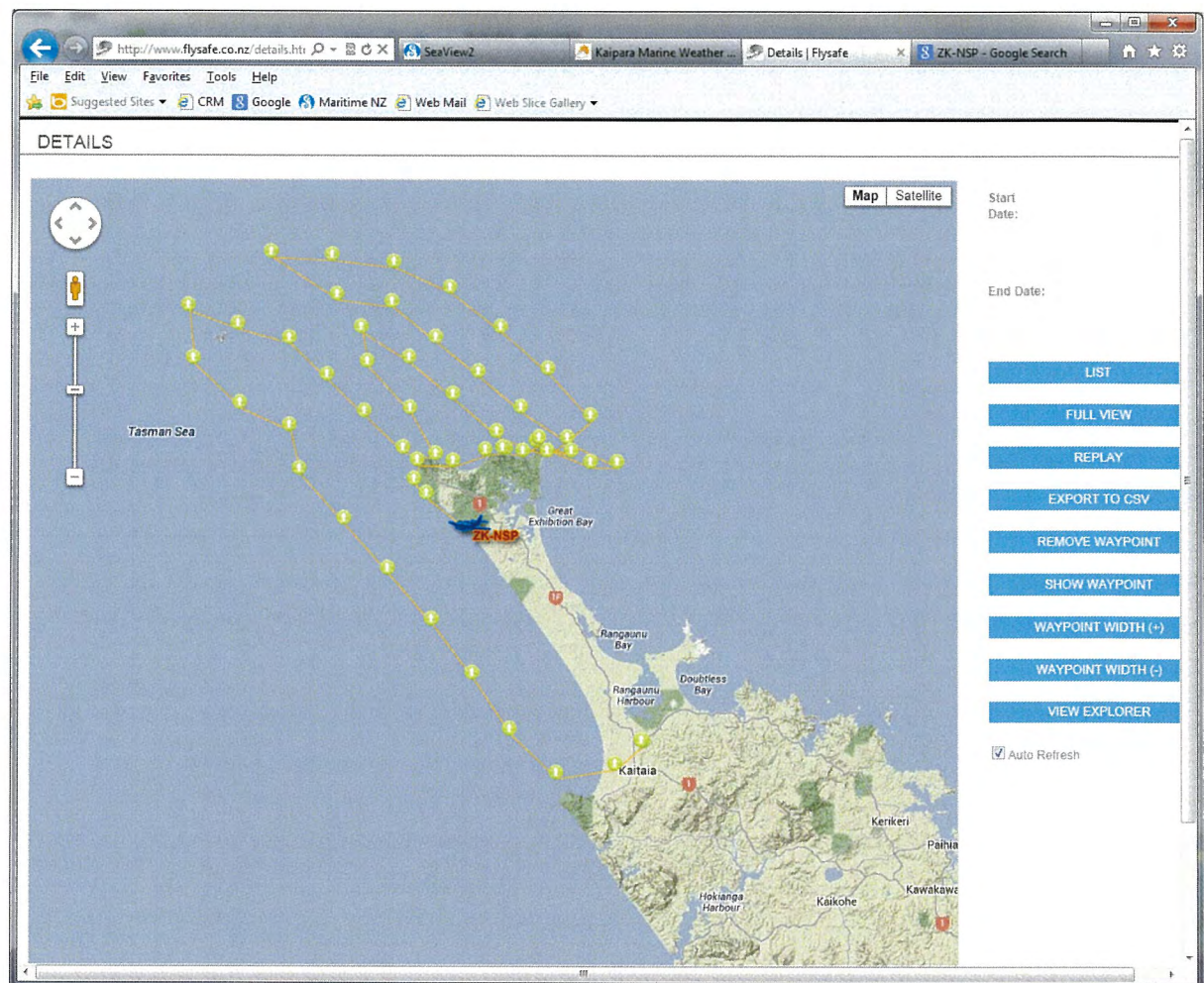
Form: RCCOPS-018

APPENDIX 4:

First Flight



Second Flight



APPENDIX 5:

TELEPHONE: +64 4 577 8030
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EMAIL: rccnz@maritimenz.govt.nz



25/06/2013 11:30:00

Search 25 Jun NZST

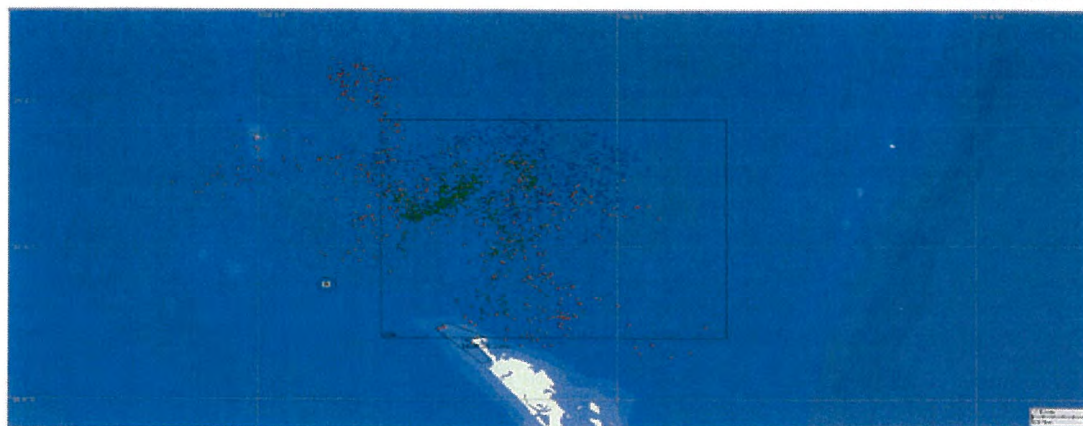
Incident	RCC0401_13_CH_1
Description	NINA
Onn Start Time	3/06/2013 23:30:00
Onn File	NZSRR SHP
Current File	RCC0401_13_DW_7_HYCOM_GLOBAL_1_NC
----- SEARCH OBJECTS -----	
Search Object1	Life Raft - NO BALLAST SYSTEMS - (Average)
Wind Factor	0.040
Leeway Divergence	28
Wind Adjustment	0.031
Search Object2	Sailing Vessel Mono hull, FULL Keel - DEEP Draft
Wind Factor	0.03
Leeway Divergence	48
Wind Adjustment	0
Search Object3	Boating Debris - F/V debris
Wind Factor	0.02
Leeway Divergence	10
Wind Adjustment	0
Drift Error	0.30
Safety Factor	1.10
Fix Error	10.00
***** SEARCH AREA *****	
Prediction Time	25/06/2013 11:30:00
Predicted SAR Area (NM)	169487.34
A	36 29.91 S, 170 19.1 E
B	27 53.04 S, 170 19.1 E
C	27 53.04 S, 177 54.14 E

Rescue Coordination Centre New Zealand
Fax: 04 5778038

Form: RCCOPS-018

APPENDIX 5 cont:

TELEPHONE: +64 4 577 8030
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28/06/2013 23:30:00

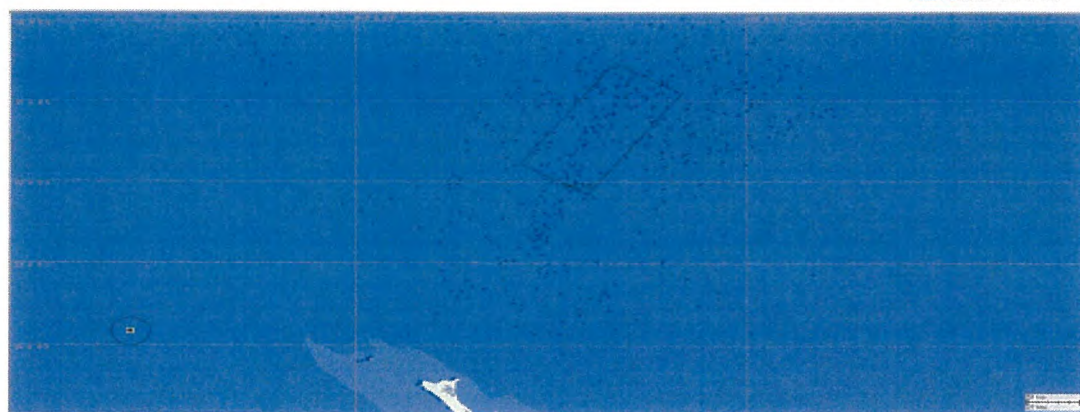
Incident	RCC0401_13_CH 2
Description	NINA
Onft Start Time	3/06/2013 23:30:00
Grid File	NZSRR.SHP
Current File	RCC0401_13_DW_7_HYCOM_GLOBAL1.NC
----- SEARCH OBJECTS -----	
Search Object1	Life Raft - NO BALLAST SYSTEMS - (Average)
Wind Factor	0.042
Leeway Divergence	28
Wind Adjustment	0.031
Search Object2	Sinking Vessel Mono hull, FULL Keel - DEEP Draft
Wind Factor	0.03
Leeway Divergence	48
Wind Adjustment	0
Search Object3	Boating Debris - F/V debris
Wind Factor	0.02
Leeway Divergence	10
Wind Adjustment	0
Onft Error	0.30
Safety Factor	1.10
Fix Error	10.00
----- SEARCH AREA -----	
Prediction Time	28/06/2013 23:30:00
Predicted SAR Area (NM)	284729.29
A	34 56.06 S, 166 6.36 E
B	26 50.07 S, 166 6.36 E
C	26 50.07 S, 176 0.03 E

Rescue Coordination Centre New Zealand
Fax: 04 5778038

Form: RCCOPS-018

APPENDIX 6:

TELEPHONE: +64 4 577 8030
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EMAIL: rccnz@maritimenz.govt.nz



30/06/2013 23:30:00 Search 31 Jun NZST

Incident	RCC0401_13_CH_5A
Description	SY Nina
Drift Start Time	3/06/2013 23:30:00
----- SEARCH OBJECTS -----	
Search Object1	Life Raft - NO BALLAST SYSTEMS - (Average)
Search Object2	Sailing Vessel Mono-hull, FULL Keel - DEEP Draft
Search Object3	Boating Debris - F/V debris
***** SEARCH AREA *****	
Prediction Time	30/06/2013 23:30:00
Predicted SAR Area (NM) - Defined	3780
A	30 31.3 S 174 38.7 E
B	30 54.3 S 175 20.0 E
C	32 09.7 S 174 21.8 E
D	31 46.4 S 173 40.8 E
***** SEARCH REGION *****	
Predicted SAR Area (NM) - Overall	128049.06
A	35 13 44 S, 170 34 43 E
B	28 24 54 S, 170 34 43 E
C	28 24 54 S, 176 57 37 E
D	35 13 44 S, 176 57 37 E
Centre point of Area	31 49 19 S, 173 46 10 E

Rescue Coordination Centre New Zealand
Fax: 04 5778038

Form: RCCOPS-018

APPENDIX 7:

TELEPHONE: +64 4 577 8030
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2/07/2013 0:30:00 Area 2 search 2 Jul NZST

Incident	RCC0401_13_V2_CH_CREW_LKP
Description	SY NINA
Drift Start Time	3/06/2013 21:30:00
----- SEARCH OBJECTS -----	
Search Object1	Life Raft - NO BALLAST SYSTEMS - (Average)
Wind Factor	0.042
Leeway Divergence	28
Wind Adjustment	0.031
Drift Error	0.30
Safety Factor	1.10
Fix Error	5.00
SEARCH AREA (SA1)	
Prediction Time	2/07/2013 0:30:00
Predicted SAR Area (NM)	4000
A	30 30.6 S 165 00.7 E
B	31 25.1 S 167 11.2 E
C	31 53.3 S 166 55.2 E
D	30 58.5 S 164 44.9 E
SEARCH AREA (SA2)	
Prediction Time	2/07/2013 0:30:00
Predicted SAR Area (NM)	1700
A	29 57.9 S 169 34.6 E
B	31 03.2 S 169 58.2 E
C	31 10.9 S 169 29.3 E
D	30 05.6 S 169 05.8 E

Rescue Coordination Centre New Zealand
 Fax: 04 5778038

Form: RCCOPS-018

15.7 Suspension SOP and Suspension Checklist

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 a SITREP or phone notifying all participating organisations, NoK, 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 Suspension of **Category II** Search: 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;
- (vi) on occasions there may be a need to seek a medical opinion or other expertise when determining the survival of casualties; and
- (vii) 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 following agreement, request approval from the appropriate Suspending Authority.

- (a) The completed Suspension of **Category II** Search: Mission 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.
- (b) 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.
- (c) 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. In such cases, 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.

8.1.7.2 The full suspension process will be followed if search activity undertaken following the reopening of a suspended search is not successful.

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

8.1.9 Ministerial Advice

8.1.9.1 The Suspending Authority (Director of Civil Aviation, Director Maritime New Zealand) may, at his or her discretion, refer the matter, to the Minister of Transport for final decision

8.1.10 Next of Kin (NoK)

8.1.10.1 Before a **Category II** 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.

8.1.10.2 Where possible, prior notification of the intention to suspend a search should be given to the Next of Kin (NoK) at least 24 hours before suspension is effected.

8.1.11 Notification of NoK 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. The Next-of-Kin (NoK) are to be fully briefed on the suspension before the suspension media release is issued.

8.2 Dealing with Relatives

8.2.1 Briefing Relatives during a Search

8.2.1.1 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 (NoK) of missing persons that the search has been suspended. An open, frank and transparent approach should be taken. 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.

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 prolonged search, however, it may be appropriate to enable relatives and/or NoK to see the RCCNZ Operations Room and be shown the Search Plans or for a RCCNZ staff member to travel to meet and personally brief the family. 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.

8.3 Private Searches

8.3.1 Should a private search be commenced during an official search, every endeavour should be made to integrate the private SRU tasking into the official search. This may be achieved by providing appropriate tasks and liaison with the private search organisation/s. SMC's are to note, however, that only suitably qualified and experienced personnel and resources should be deployed to search – not to do so poses danger to other participants in the search and to themselves.

8.3.2 Should a private search be conducted beyond the termination or suspension of the official search, RCCNZ should maintain a close liaison and sharing of the information that

becomes available. In the event that adequate information becomes available to warrant the continuation of the official search, a SMC is to resume the search.

- 8.3.3 In such cases where a private search is undertaken, it is imperative that a clear delineation is made between the private and official SRUs. This is to include the tasking of SRU's and their subsequent claims for the services provided.
- 8.3.4 In the event that private searchers request RCCNZ to coordinate their efforts, either during the official search, or afterwards, RCCNZ should make every effort to do so.

Suspension of Category II Search: Mission Checklist

1. Mission Designation _____		(✓ Tick Boxes)	Checked	Satisfactory
2.	Re-Evaluation	- Distress Position		
		- Drift Factors		
		- Intelligence		
		- Search Decisions		
		- Assumptions		
		- Scenarios		
3.	Review	- Search Areas/Plans		
		- Assigned Areas Searched		
			Insert Values	
	- Coverage Factor			
	- Probability of Detection			
	- Total Search Time (Aircraft)			
	(Vessel/s)			
	(Ground Teams)			
4.	Survivability Assessment	- Elapsed Time of Incident		
		- Environmental Conditions (Temps/Chill Factors)		
		- Physical Condition (Potential Survivors)		
		- Survival Times Ex Graphs		
5. Recommendation for Suspension (State Reasons)				

Signature _____ Date _____ Time _____				
(SMC)				
Signature _____ Date _____ Time _____				
(ROCNZ Duty Manager)				
6. Suspending Authority Briefed By _____ Date _____ Time _____				
(ROCNZ Duty Manager or SMC)				
7. Request Approved Not Approved Request Received By: Fax Phone Email				
(NAME OF SUSPENDING AUTHORITY)				
Signature _____ Date _____ Time _____				
(SUSPENDING AUTHORITY)				

15.8 Completed Suspension Authority document



Suspension of Category II Search: Mission Checklist

1.	Mission Designation	RCC0401/13 – Sailing Yacht NINA		
		(Tick Boxes)	Checked	Satisfactory
2.	Re-Evaluation	- Distress Position	✓	✓
		- Drift Factors	✓	✓
		- Intelligence	✓	✓
		- Search Decisions	✓	✓
		- Assumptions	✓	✓
		- Scenarios	✓	✓
3.	Review	- Search Areas/Plans	✓	✓
		- Assigned Areas Searched	✓	✓
		Insert Values		
		- Coverage Factor	1	
		- Probability of Detection	79%	
		- Total Search Time (Aircraft)	75.75 hrs (est)	
		(Vessel/s)	nil	
		(Ground Teams)	nil	
4.	Survivability Assessment	- Elapsed Time of Incident	754 hrs	
		- Environmental Conditions (Temps/Chill Factors)	17-21deg C	
		- Physical Condition (Potential Survivors)	Good	
		- Survival Times Ex Graphs	11.7-36+ hours	

5. Recommendation for Suspension (State Reasons)

RCCNZ was notified on 14 June 2013 of concerns for the 59 foot (70' with bowsprit) schooner NINA, which sailed from Opua (NZ) on 29 May 2013 for Newcastle (Australia) with seven crew. The NINA's skipper had advised he expected to arrive in Newcastle on 8 June 2013. RCCNZ commenced the first stage of SAR action by obtaining further information about the vessel and initiated broadcast action to ask shipping to watch for the NINA. RCCNZ also assessed that the NINA might be taking longer than anticipated on its voyage and that it may take another 10 to 11 days to get to Newcastle. This view was shared by RCC Australia.

No form of distress message had been received from the NINA but it was learned that the vessel had experienced a deep Low pressure weather system on and around 4 June 2013 with large seas and very strong winds. The last voice communication with the vessel occurred by Iridium satellite telephone on 03 2153 UTC Jun 2013.

Radio broadcasts continued to shipping over an area from the Australian coast almost to New Caledonia to east and south of NZ, covering the Tasman Sea. NINA did not arrive in Newcastle by 25 June, the date calculated by RCCNZ. A number of scenarios were considered, including a catastrophic event on or about 4 June, resulting in the crew having to use their liferaft or enter the water, through to the NINA being intact but compromised in some way in its ability to make way and to communicate.

Active searching was commenced on 25 June. The searches initially focused on finding the NINA intact, and then concentrated on finding the liferaft. No search for people in the water was mounted because, if there had been an event on or about 4 June, the Cold Water Exposure modelling shows the maximum survival time for a person in the water had long since passed.

Form: RCCOPS-014



The people could not have survived by the time RCCNZ was informed, ten days later, of concerns for the NINA.

The searches to date have covered an area totalling more than 736 870 square nautical miles, using a Royal New Zealand Air Force P3K2 Orion for the larger areas, plus a helicopter and commercial fixed wing aircraft for coastal searches and other smaller areas near the New Zealand coast.

The Orion searched an area to the north of Cape Reinga on the 25 June and the following day searched the yacht's intended track across the Tasman to Australia. On Friday 28 June a Piper Chieftain and a Squirrel helicopter from Phillips Search and Rescue Trust searched from Port Waikato to North Cape and coastal islands to the north of Cape Reinga. An additional shoreline search by helicopter was conducted on Saturday 29 June from Port Waikato south to New Plymouth.

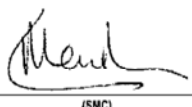
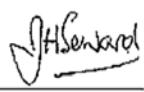
An RNZAF Orion then conducted a visual search of an area north-east of NZ on Sunday 30 June, looking for a liferaft or debris from the yacht. A further area to the north of this was searched on Monday 01 July. On Tuesday 02 July an Orion crew made a visual search looking for a liferaft in an area to the south east of Norfolk Island. The P3 Orion completed a radar search area of 120,745 square nautical miles on Thursday 04 July, extending to the north and west to encompass the Elizabeth and Middleton Reefs. While conducting all its searches, both radar and visual, the P3 Orion made regular VHF calls to the NINA. There was no radio contact with, or any sign of, NINA, a liferaft or debris attributed to the yacht.

RCCNZ believes that the P3K2 Orion radar equipment would have located the yacht if it had been in any of the search areas. The most probable areas, determined by RCCNZ's drift modelling software, of a drifting liferaft were visually searched by the Orion and Phillips Search and Rescue Trust aircraft with a high probability of detection (good visual searching conditions).

There has been no contact with or sightings of NINA since 11:50 am NZST on 4 June. No detections of the EPIRB have been received. The last position report from the SPOT satellite personal tracking device was received on the 2 June.

RCCNZ considers the highest probability is that a catastrophic event occurred to the yacht on or about the 4 June 2013. The ability of people to survive in a liferaft has decreased each day. There have also been five storms / large fronts through the area since the 4 June.

RCCNZ considers that further search effort for survivors would be to no avail, and recommend suspension of search operations pending receipt of any more information.

Signature		Date	5 July 2013	Time	1930 NZST
	(SMC)				
Signature		Date	5 July 2013	Time	1945 NZST
	(RCCNZ Duty Manager)				
6. Suspending Authority Briefed By		Date	5 July 2013	Time	2012 NZST
	(RCCNZ Duty Manager or SMC)				
7. Lindsay Sturt	Request Approved	Not-Approved	Request Received By:-Fax	Phone	Email
Acting Director Maritime New Zealand (NAME OF SUSPENDING AUTHORITY)					
Signature	(SUSPENDING AUTHORITY)	Date	5 July 2013	Time	2040 NZST

Form: RCCOPS-014

15.9 Outward NZ Customs Report

Form C2B



TE MANA ARAI O AOTEAROA

OUTWARD REPORT (SMALL CRAFT)

OFFICIAL USE ONLY

Rotation number

PART A: REGISTRATION DETAILS		
Name of small craft	NINA	Registration number 227714 Date of registration July 12
Country of registration	USA	Port of destination New Castle
Sail number	2	Home port Whilimington Delaware
Name of person in charge	David A. Dyche	Total number of persons on board 7
PART B: DEPARTURE DETAILS		
Port of departure	OPUA NZ	Date of departure 29-5-2013 Time of departure 10 AM
Next overseas port	New Castle, AU	Intended date of return to New Zealand None
Intended itinerary	1. Opuke to New Castle AU 2. 3. 4.	
COMMERCIAL CARGO (Please record on a separate sheet and attach if additional space is required.)		
List all goods carried in or on the craft, whether in the course of international trade or for sale or supply in those goods, but excluding the personal effects of crew and passengers and stores for craft. None		
FIREARMS (Specify makes, models, and serial numbers.)		
YES ☐ NO ☒		
CONTROLLED DRUGS/MEDICINES ON BOARD (Name and quantity.)		
YES ☐ NO ☒		
STORES ON BOARD		
Spirits	Quantity	
Beer	2 Bottles	
Wine	14 Bottles	
Cigarettes/tobacco	None	
SMALL CRAFT STATUS		
Tick box that applies:		
Visiting overseas craft Have you sold or otherwise disposed of any equipment from your craft while in New Zealand?	Departing New Zealand craft	Craft being permanently exported
YES ☐ Please provide details		
NO ☒		
OFFICIAL USE ONLY		
TIE number	New Zealand Safety Certificate number	Export Entry number

PART C: CREW AND PASSENGER DETAILS (Person in charge first)			
(Surname in block letters)		(Attach any additional details of crew members on a separate sheet)	
Surname	Dyche III	Surname	Dyche
First name(s)	David A. III	First name(s)	David N
Nationality	USA	Nationality	USA
Date of birth	1955	Date of birth	1995
Passport number	[REDACTED]	Passport number	[REDACTED]
Overseas contact	[REDACTED]	Overseas contact address	[REDACTED]
Next of kin, relationship	Cherie Martinez Sister	Next of kin, relationship	Cherie Martinez Aunt
Address/telephone of next of kin	[REDACTED]	Address/telephone of next of kin	[REDACTED]
Surname	Dyche Rosem	Surname	Wright
First name(s)	Rosemary	First name(s)	Danielle E
Nationality	USA	Nationality	USA
Date of birth	1952	Date of birth	1994
Passport number	[REDACTED]	Passport number	[REDACTED]
Overseas contact address	Cherie Martinez in	Overseas contact address	[REDACTED]
Next of kin, relationship	Sister in law	Next of kin, relationship	Parents
Address	[REDACTED]	[REDACTED]	[REDACTED]
Surname	Wootton	Surname	Jackson
First name(s)	Matthew	First name(s)	Kyle
Nationality	British	Nationality	USA
Date of birth	1978	Date of birth	86
Passport number	[REDACTED]	Passport number	[REDACTED]
Overseas contact address	[REDACTED]	Overseas contact address	Amy Jackson
Next of kin, relationship	IAN WOOTTON, FATHER	Next of kin, relationship	Amy Jackson, mother
Address/telephone of next of kin	As above	Address/telephone of next of kin	As above
Surname	Nemeth	Surname	
First name(s)	EVI	First name(s)	
Nationality	USA	Nationality	
Date of birth	1940	Date of birth	
Passport number	[REDACTED]	Passport number	
Overseas contact address	Laslo Nemeth	Overseas contact address	
Next of kin, relationship	Laslo Nemeth, son	Next of kin, relationship	
Address/telephone of next of kin	[REDACTED]	Address/telephone of next of kin	

PART D: CRAFT DETAILS			
Craft type Yacht ☒ Motor launch ☐ Other (specify)		Design <i>starling Barges</i>	
Yacht rig Cutter ☐ Sloop ☐ Ketch ☐ Yawl ☐ Schooner ☒ Other (Specify)		Mast construction Alloy ☐ Timber ☐ Composite ☒ Other (Specify)	
Hull construction Steel ☐ Alloy ☐ Ferro ☐ Cement ☐ Fibreglass ☐ Composite ☒ Other (Specify) <i>wood</i>			
Length <i>59</i> Metres ☐ Feet ☐	Beam <i>15</i> Metres ☐ Feet ☐	Draught <i>10</i> Metres ☐ Feet ☐	Gross tonnage <i>22</i>
COLOURS			
Mast <i>Tan</i>		Deckhouse/Superstructure (Tops) <i>Dark sh</i>	
Hull (Above waterline) <i>white</i>		Deckhouse/Superstructure (Sides) <i>NA</i>	
Hull (Below waterline) <i>green</i>		Decks <i>Tech</i>	
Dodgers/Sail covers <i>None</i>		Sails <i>Duckron</i>	
ENGINE			
Make <i>Cummins</i>		Model <i>4B</i>	
Power (HP/Kw) <i>150</i>		Passage speed under motor <i>6</i>	
Fuel capacity <i>100</i>		Fuel consumption <i>.7 gal</i>	
ELECTRONICS			
Radar 1	Make	Model	Range
Radar 2	Make	Model	Range
SSB	Make	Model	Call sign
VHF <i>2</i>	Make <i>Garmo</i>	Model	Call sign
HAM	Make	Model	Call sign <i>SW4920</i>
Cellphone <i>2</i>	Make	Model	Number
INMARSAT voice	Make	Model	MMSI numbers
INMARSAT fax	Make	Model	MMSI numbers
INMARSAT data	Make	Model	MMSI numbers
GPS 1 <i>1</i>	Make <i>Gar</i>	Model	
GPS 2 <i>1</i>	Make <i>Garman</i>	Model	
Radar detector (CARD)	Make	Model	
Radar reflector	Make	Model	
SART	Make	Model	
EPIRB 121.5/406 mHz <i>1</i>	Make <i>ACE</i>	Model	Serial number (if 121.5 beacon)
RADIO SCHEDULES MAINTAINED			
Frequencies	Times		Shore station

OTHER EQUIPMENT			
Life raft 1	Make 8 person	Model	Capacity 8 Per
Dinghy/Tender 1	Make	Model	Length 10 ft
	Type	Capacity	Colour
Outboard motor	Make	Model	Power (HP/Kw)
Flares Parachute ☒ Hand held ☐ Smoke ☐ Other (Specify)			
ANY OTHER IDENTIFYING FEATURES 			
PART E: OWNERSHIP DETAILS			
Name of owner David A Duche			
Owners address [REDACTED]			
[REDACTED]			
[REDACTED]	Telephone	Mobile phone	Facsimile [REDACTED]
DECLARATION I, <u>David A Duche</u> being the Person in Charge declare that all particulars stated in this Outward Report are true and correct. Signature of Person in Charge: <u>[Signature]</u> Date: <u>29 May 2013</u> You are hereby advised that the information on this form is collected for the purpose of Customs clearance, monitoring the movement of craft and persons and border security. You must provide all information requested on the form. Failure to do so is an offence. The information you provide will be held by the New Zealand Customs Service pursuant to the Customs and Excise Act 1996. The Privacy Act 1993 provides rights of access to and the correction of personal information. You may gain access to and correct this information at: New Zealand Customs Service, The Customhouse, 19 Whitmore Street, PO Box 2218, Wellington.			
NOTES			
1. Outward Report timeframe: You are required to deliver the Outward Report to Customs not less than 4 hours before the intended time of departure of the craft. 2. Cash Reporting—NZ\$10,000 or More: If you are carrying, whether on yourself or in your baggage, cash (being coins or paper money) of NZ\$10,000 or more (or the foreign currency equivalent), you are required by the Financial Transactions Reporting Act 1996 to complete a Border Cash report.			
WARNING			
There are heavy penalties under New Zealand law for illicit importation and exportation of drugs. DRUG TRAFFICKING IS NOT WORTH THE RISK			
OFFICIAL USE ONLY			Attached
Passenger and crew details list(s) attached			☐
Craft photo(s) (Electronic or attached)			☐
Departure card(s)			☐
New Zealand Safety Certificate (for New Zealand registered small craft only)			☐

15.10 SAD for satellite image of life raft

Search Area Determination

IMPORTANT INFORMATION FOR THIRD PARTY USERS OF SEARCH AREA DETERMINATIONS

PLEASE READ THESE NOTES BEFORE USING ANY SEARCH AREA DETERMINATION

Rescue Co-Ordination Centre New Zealand (RCCNZ) is part of Maritime New Zealand (MNZ). The functions of RCCNZ include using specialised software to prepare Search Area Determinations (SADs) to assist in search and rescue operations. SADs may be provided by RCCNZ for use by third parties, including Incident Controllers and Incident Management Teams within the New Zealand Police and The Royal New Zealand Coastguard. The accuracy of SADs depends on the quality of the information provided by third parties to RCCNZ and will, if the information provided is accurate, identify a general area in which a search might be undertaken.

This RCCNZ SAD is made available subject to the following understanding:

1. A SAD is only one tool among many available to an Incident Controller and Incident Management Team: it should not be relied on as the sole method of identifying a search area.
2. A SAD is not intended, nor should it be relied on, to provide anything more than an indication of where to search.
3. A SAD does not address how to search or what resources to use during a search: the deployment and tasking of these functions is the responsibility of the Incident Controller.
4. A SAD must be used in conjunction with all other available information, including observations at the local level, and input from specialist advisers who know the area in which the search is to be conducted.
5. Third party users of a SAD must ensure that, in addition to the general matters referred to above, they are fully conversant with the following specific limitations on the use of SADs:

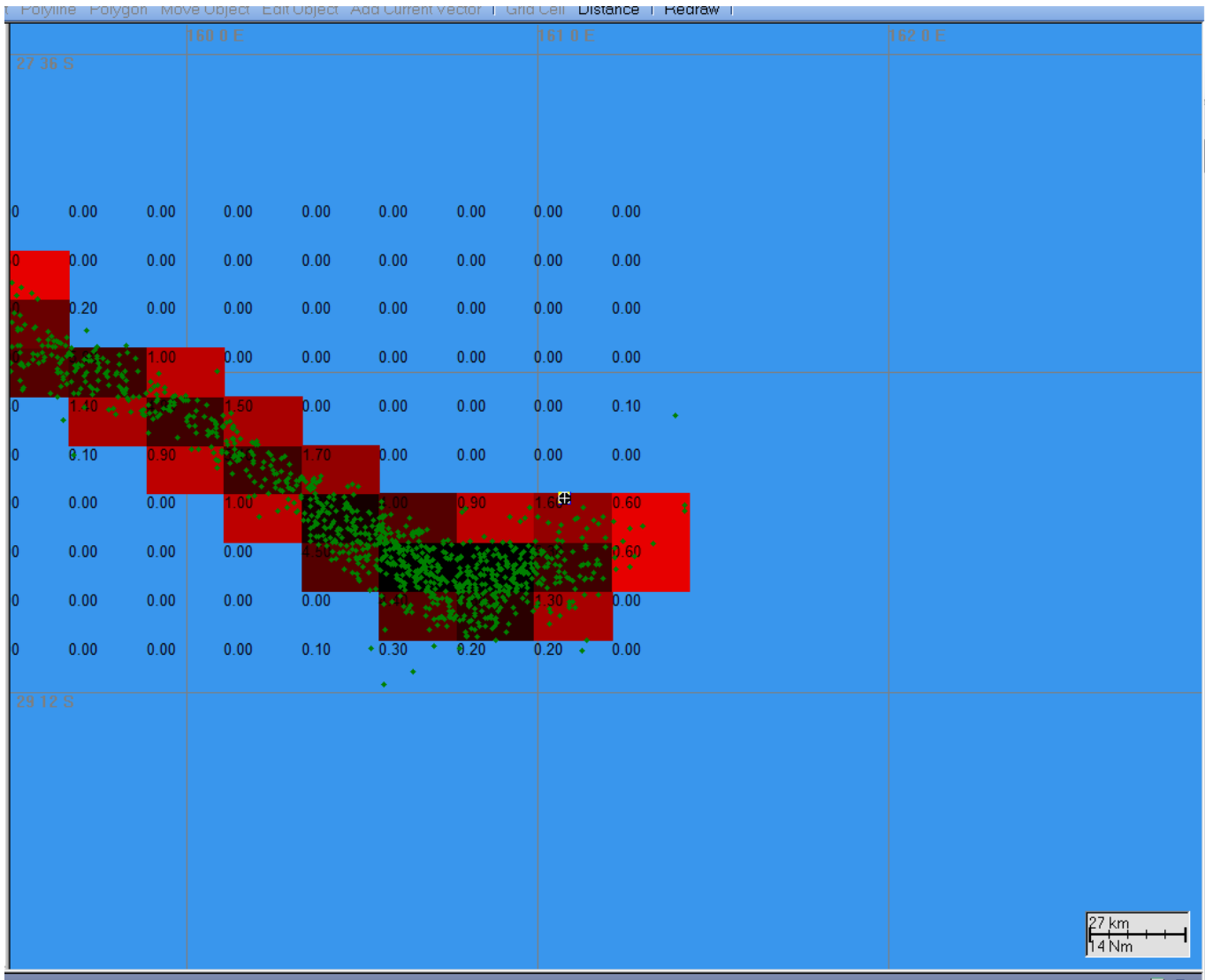
- a. **All times mentioned in SADs are given in Universal Coordinated Time (UTC)**, not New Zealand local time. To convert these times to New Zealand Standard Time (NZST), 12 hours must be added to the UTC: to convert to New Zealand Daylight Time (NZDT), 13 hours must be added to the UTC.
 - b. SADs are prepared using information provided to RCCNZ by third parties relating to the location and time the event is believed to have occurred. Errors in any of the information provided to RCCNZ will result in errors in the SAD and it must not be relied upon as definitive.
 - c. The SAD software draws on computerised wind data, which is shown in a report attached to the SAD. Third party users of the SAD must check the data in the report against the actual weather at the scene and provide any updated information to RCCNZ.
 - d. The SAD software draws on computer modelled water movement data, derived from satellite observations. Third party users should obtain local marine advice to confirm the SAD water movement data.
 - e. **Third parties must contact RCCNZ as soon as possible after becoming aware of any changes to any of the data provided for use in the preparation of a SAD. On receipt of that information, RCCNZ will, if requested, re-run the model to produce an updated SAD. Each SAD is based on the information and assumptions used to produce that particular SAD.**
6. If there is any doubt as to the use and limitations of the attached SAD, immediately contact RCCNZ for clarification.

Signature:
.....

Date:

Name:
.....

Time:



9/09/2013 23:52:00

Incident	RCC0401_13_OM_20130909_LR
Description	LIFERAFT - 8 person with ballast
Drift Start Time	2/09/2013 23:52:00
Grid File	NZSRR.SHP
Current File	RCC0401_13_RD_LR_HYCOM_GLOBAL1.NC
Wind Driven Currents	Off
Wind File	RCC0401_13_OM_20130909_LR_GFS.NC

Wind Values (at center of drifting search area)

Time	Speed (kts)	From
2/09/2013 23:52:00	23.71 kts	SSE
3/09/2013 0:52:00	24.16 kts	SSE
3/09/2013 1:52:00	24.02 kts	SSE
3/09/2013 2:52:00	23.87 kts	SE
3/09/2013 3:52:00	23.73 kts	SE
3/09/2013 4:52:00	23.96 kts	SE
3/09/2013 5:52:00	24.21 kts	SE
3/09/2013 6:52:00	24.52 kts	SE
3/09/2013 7:52:00	24.37 kts	SE
3/09/2013 8:52:00	24.23 kts	SE
3/09/2013 9:52:00	24.09 kts	SE
3/09/2013 10:52:00	23.67 kts	SE
3/09/2013 11:52:00	23.26 kts	SE
3/09/2013 12:52:00	22.85 kts	SE
3/09/2013 13:52:00	22.24 kts	SE
3/09/2013 14:52:00	21.62 kts	SE
3/09/2013 15:52:00	21 kts	SE
3/09/2013 16:52:00	20.9 kts	SE
3/09/2013 17:52:00	20.8 kts	SE
3/09/2013 18:52:00	20.7 kts	SE
3/09/2013 19:52:00	21.04 kts	SE
3/09/2013 20:52:00	21.37 kts	SE
3/09/2013 21:52:00	21.7 kts	SE
3/09/2013 22:52:00	21.65 kts	SE
3/09/2013 23:52:00	21.59 kts	SE

4/09/2013 0:52:00	23.15 kts	SE
4/09/2013 1:52:00	22.77 kts	SE
4/09/2013 2:52:00	22.38 kts	SE
4/09/2013 3:52:00	21.98 kts	SE
4/09/2013 4:52:00	21.92 kts	SSE
4/09/2013 5:52:00	21.87 kts	SSE
4/09/2013 6:52:00	21.83 kts	SSE
4/09/2013 7:52:00	21.51 kts	SSE
4/09/2013 8:52:00	21.16 kts	SSE
4/09/2013 9:52:00	20.81 kts	SSE
4/09/2013 10:52:00	19.68 kts	SSE
4/09/2013 11:52:00	18.56 kts	SSE
4/09/2013 12:52:00	17.45 kts	SSE
4/09/2013 13:52:00	17.56 kts	SSE
4/09/2013 14:52:00	17.71 kts	SSE
4/09/2013 15:52:00	17.89 kts	SSE
4/09/2013 16:52:00	18.27 kts	SSE
4/09/2013 17:52:00	18.65 kts	SSE
4/09/2013 18:52:00	19.02 kts	SSE
4/09/2013 19:52:00	18.56 kts	SSE
4/09/2013 20:52:00	18.11 kts	SSE
4/09/2013 21:52:00	17.67 kts	SSE
4/09/2013 22:52:00	17.23 kts	SSE
4/09/2013 23:52:00	16.81 kts	SSE
5/09/2013 0:52:00	18.15 kts	SSE
5/09/2013 1:52:00	17.95 kts	SSE
5/09/2013 2:52:00	17.74 kts	SSE

5/09/2013 3:52:00	17.52 kts	SSE
5/09/2013 4:52:00	17.72 kts	SSE
5/09/2013 5:52:00	17.93 kts	SSE
5/09/2013 6:52:00	18.15 kts	SSE
5/09/2013 7:52:00	17.64 kts	SSE
5/09/2013 8:52:00	17.17 kts	SSE
5/09/2013 9:52:00	16.73 kts	SSE
5/09/2013 10:52:00	16.44 kts	SSE
5/09/2013 11:52:00	16.15 kts	SSE
5/09/2013 12:52:00	15.87 kts	SSE
5/09/2013 13:52:00	16.05 kts	SSE
5/09/2013 14:52:00	16.24 kts	SSE
5/09/2013 15:52:00	16.37 kts	SSE
5/09/2013 16:52:00	15.83 kts	SSE
5/09/2013 17:52:00	15.42 kts	SE
5/09/2013 18:52:00	15.19 kts	SE
5/09/2013 19:52:00	14.6 kts	SE
5/09/2013 20:52:00	14 kts	SE
5/09/2013 21:52:00	13.41 kts	SE
5/09/2013 22:52:00	12.74 kts	SE
5/09/2013 23:52:00	12.09 kts	SE
6/09/2013 0:52:00	10.12 kts	SE
6/09/2013 1:52:00	10.06 kts	SE
6/09/2013 2:52:00	10.03 kts	SE
6/09/2013 3:52:00	10.06 kts	SE
6/09/2013 4:52:00	9.7 kts	SE
6/09/2013 5:52:00	9.39 kts	SE

6/09/2013 6:52:00	9.11 kts	SE
6/09/2013 7:52:00	8.76 kts	SE
6/09/2013 8:52:00	8.45 kts	SE
6/09/2013 9:52:00	8.17 kts	ESE
6/09/2013 10:52:00	7.82 kts	ESE
6/09/2013 11:52:00	7.55 kts	ESE
6/09/2013 12:52:00	7.37 kts	ESE
6/09/2013 13:52:00	6.47 kts	E
6/09/2013 14:52:00	5.62 kts	E
6/09/2013 15:52:00	4.86 kts	E
6/09/2013 16:52:00	4.85 kts	ENE
6/09/2013 17:52:00	5.06 kts	ENE
6/09/2013 18:52:00	5.45 kts	NE
6/09/2013 19:52:00	5.63 kts	NE
6/09/2013 20:52:00	5.88 kts	NE
6/09/2013 21:52:00	6.18 kts	NNE
6/09/2013 22:52:00	5.84 kts	NNE
6/09/2013 23:52:00	5.64 kts	NNE
7/09/2013 0:52:00	3.54 kts	NE
7/09/2013 1:52:00	3.3 kts	NE
7/09/2013 2:52:00	3.06 kts	NE
7/09/2013 3:52:00	2.82 kts	NE
7/09/2013 4:52:00	3.21 kts	NE
7/09/2013 5:52:00	3.61 kts	NE
7/09/2013 6:52:00	4 kts	NE
7/09/2013 7:52:00	4.26 kts	NE
7/09/2013 8:52:00	4.52 kts	NNE

7/09/2013 9:52:00	4.79 kts	NNE
7/09/2013 10:52:00	5.37 kts	NNE
7/09/2013 11:52:00	5.98 kts	NNE
7/09/2013 12:52:00	6.6 kts	NNE
7/09/2013 13:52:00	6.74 kts	NNE
7/09/2013 14:52:00	7.09 kts	N
7/09/2013 15:52:00	7.47 kts	N
7/09/2013 16:52:00	7.3 kts	N
7/09/2013 17:52:00	7.24 kts	NNW
7/09/2013 18:52:00	7.28 kts	NNW
7/09/2013 19:52:00	7.18 kts	NNW
7/09/2013 20:52:00	7.15 kts	NW
7/09/2013 21:52:00	7.21 kts	NW
7/09/2013 22:52:00	7.42 kts	NW
7/09/2013 23:52:00	7.66 kts	NW
8/09/2013 0:52:00	9.32 kts	NW
8/09/2013 1:52:00	8.75 kts	NW
8/09/2013 2:52:00	8.4 kts	WNW
8/09/2013 3:52:00	8.32 kts	WNW
8/09/2013 4:52:00	7.48 kts	W
8/09/2013 5:52:00	6.82 kts	W
8/09/2013 6:52:00	6.43 kts	WSW
8/09/2013 7:52:00	5.33 kts	W
8/09/2013 8:52:00	4.23 kts	W
8/09/2013 9:52:00	3.13 kts	W
8/09/2013 10:52:00	2.62 kts	W
8/09/2013 11:52:00	2.15 kts	W

8/09/2013 12:52:00	1.71 kts	W
8/09/2013 13:52:00	1.59 kts	W
8/09/2013 14:52:00	1.47 kts	W
8/09/2013 15:52:00	1.36 kts	WNW
8/09/2013 16:52:00	1.44 kts	WNW
8/09/2013 17:52:00	1.49 kts	WNW
8/09/2013 18:52:00	1.56 kts	WNW
8/09/2013 19:52:00	1.37 kts	WNW
8/09/2013 20:52:00	1.29 kts	W
8/09/2013 21:52:00	1.32 kts	WSW
8/09/2013 22:52:00	0.77 kts	WNW
8/09/2013 23:52:00	1.1 kts	N
9/09/2013 0:52:00	1.9 kts	NNE
9/09/2013 1:52:00	2 kts	N
9/09/2013 2:52:00	2.11 kts	N
9/09/2013 3:52:00	2.23 kts	N
9/09/2013 4:52:00	1.85 kts	NNE
9/09/2013 5:52:00	1.66 kts	NNE
9/09/2013 6:52:00	1.53 kts	NE
9/09/2013 7:52:00	2.57 kts	NE
9/09/2013 8:52:00	3.62 kts	NE
9/09/2013 9:52:00	4.67 kts	NE
9/09/2013 10:52:00	6.07 kts	NNE
9/09/2013 11:52:00	7.67 kts	NNE
9/09/2013 12:52:00	9.37 kts	NNE
9/09/2013 13:52:00	9.68 kts	NNE
9/09/2013 14:52:00	10.04 kts	N

9/09/2013 15:52:00	10.42 kts	N
9/09/2013 16:52:00	11.26 kts	N
9/09/2013 17:52:00	12.15 kts	N
9/09/2013 18:52:00	13.01 kts	N
9/09/2013 19:52:00	13.29 kts	N
9/09/2013 20:52:00	13.65 kts	N
9/09/2013 21:52:00	14.2 kts	N
9/09/2013 22:52:00	14.36 kts	N
9/09/2013 23:52:00	14.52 kts	N

----- SEARCH OBJECTS -----

Search Object1 Life Raft - Deep Ballast, Canopy, 4-6 MAN
(Average)

Wind Factor 0.029

Leeway Divergence 15

Wind Adjustment 0.039

Drift Error 0.30

Safety Factor 1.10

Fix Error 0.10

***** SEARCH AREA *****"

Prediction Time 9/09/2013 23:52:00

Predicted SAR Area (NM) 8469.45

A 29 11.49 S, 159 13.5 E

B 27 58.35 S, 159 13.5 E

C 27 58.35 S, 161 25.95 E

D	29 11.49 S, 161 25.95 E
Centre point of Area	28 34.92 S, 160 19.72 E

15.11 Object “C” pictures

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Object “C” pictures starts on next page.

RCC0401/13 SAR SITREP THIRTEEN, TES Object-C

Object C – Sailboat

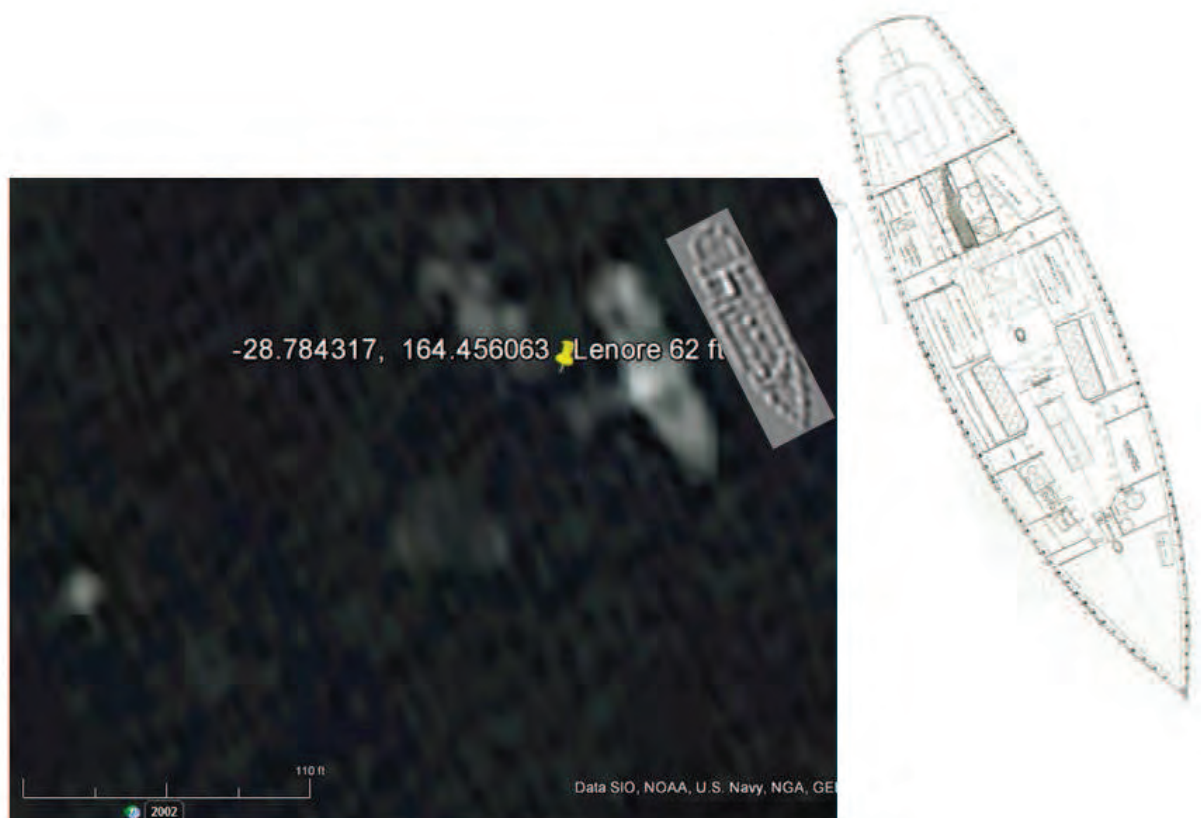
NZ Tasman Sea

Imaged 15 Sep 2013

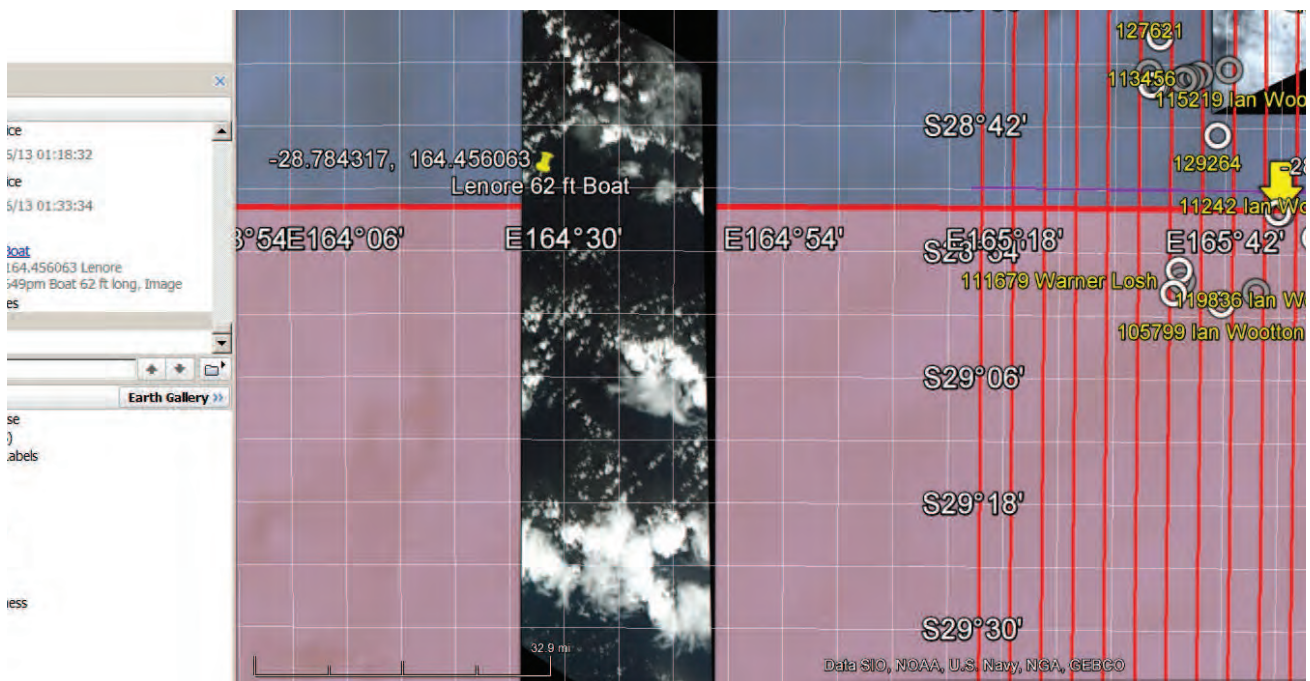
22 Sep 2013 J Borrer, R Baird



Object C: Sailing vessel; imaged 15 Sep 2013
28-47-03 S, 164-27-22 E



**Object C: Sailing vessel; imaged 15 Sep 2013; comparison to actual
engineering drawing of the schooner Nina
28-47-03 S, 164-27-22 E**



**Location Map of Object C: Sailing vessel; imaged 15 Sep 2013
28-47-03 S, 164-27-22 E**

15.12 Emails RCCNZ and TES during private search

TES correspondence is in italics – RCCNZ correspondence in standard script

First contact from TES to RCCNZ – 12 July 2013

12 July 2013

John Seward, Ops Manager

Rescue Coordination Centre New Zealand (RCCNZ)

Int'l: +64 4 5778030

Re: S/V Nina – first contact

We are 100% all volunteers with experience. On July 8, we have been contacted by the families of those members of the sailing crew of the S/V Nina for advice and possible assistance. Our organization is Texas EquuSearch Search and Recovery Team (TES) with 650 active members who participate in ground and water searches in complete collaboration with local agency command centres here in the US and in 4 countries. We have been doing this for 13 years and have access too US resources through experience and trust from our past work and relationships by our members, including search coordinators. Our Executive Director and Founder is Mr. Timothy Miller. REF: (www.TXEQ.org)

We formed a small advisory group here to update each other and to make plans to assist, if possible. My role is to collect information and recommend actions possible. My background is a marine geophysicist and have more than 40 years at this in my professional work, including several projects in your Taranaki Basin; we also have worked locally with your GNS, Lower Hutt. Several of our members have NZ experience or contacts through their law enforcement work and military training. REF: ()

We have received substantial interest by others to help and part of that is to provide funding for any further efforts by RCC NZ and the Royal Air Force (NZ). That part is on-going after being started last week. We feel this was an important commitment by those supporting the families. These funds are available only to NZ resources.

This is our weekend and we expect follow-through on requests we made in the week prior for additional leads/new information from US sources, some of which you at RCC NZ may have direct access (Iridium databases, NOAA and NASA and other satellite imaging and processing), and some maybe not; we are in a position to request special data currently 'classified' and were promised cooperation by agency officials here. This label may be removed from versions we can review and interpret. All that we access we would like to share with you at RCCNZ.

Consider this a first contact for us and we would like a contact person there to receive questions we have and to share any new information. Please advise. We are only here to help.

Respectfully,

Ralph Baird, Senior Advisor

TEXAS EQUUSEARCH

From: John Seward ()

Sent: Sunday, July 14, 2013 2:49 AM

To: 'ralph ()'

Subject: RE: RCC0401/13 SAR SITREP THIRTEEN

Good evening Ralph,

Thank you for your offer. Without knowing what information you have already obtained on the search for the NINA and its seven crew, it may be helpful for your understanding of the search effort if I attach an image that depicts the area covered, plus a copy of the text that recommends the

suspension of the search. Also attached is a copy of the last media statement issued by Maritime New Zealand.

This information of course does not cover all the nuances that are part of the planning and conduct of any search. It is significant that no information regarding NINA or its crew, that might justify considering recommencing the search, has been forthcoming since the search was suspended.

Kind regards

John

John Seward | Operations Manager RCCNZ

Maritime New Zealand | Rescue Coordination Centre New Zealand (RCCNZ) | Avalon

New Information from TES justifying that RCCNZ recommence search

From: Ralph Baird [REDACTED]

Sent: Sunday, 4 August 2013 7:16 p.m.

To: 'John Funnell'; Nigel Clifford; John Seward; OpsOfficerRCCNZ

Subject: New Information for Search for SV Nina RE: RCC0401/13 SAR SITREP THIRTEENRE: RCC0401/13 SAR SITREP THIRTEEN

New Information for Search for SV Nina

TES case #13-1371

John, Nigel, John,

The five families want your help, still. This link will take you to an UPDATES page that will show you that we have successfully repeated your work and added to the work previously conducted by RAFNZ and RCCNZ. There exist improvements to the software that you currently use that will soon be available to you and other marine SAR agencies and groups. This confirms and also forces the search area slightly to the north and we also see from the review and study that the NINA is a moving target and may have reentered the search area previously searched. We feel that this is adequate for you to resume the search and to cover these primary search areas for the families.

www.7-1-3.com/TES/NINA/UPDATES

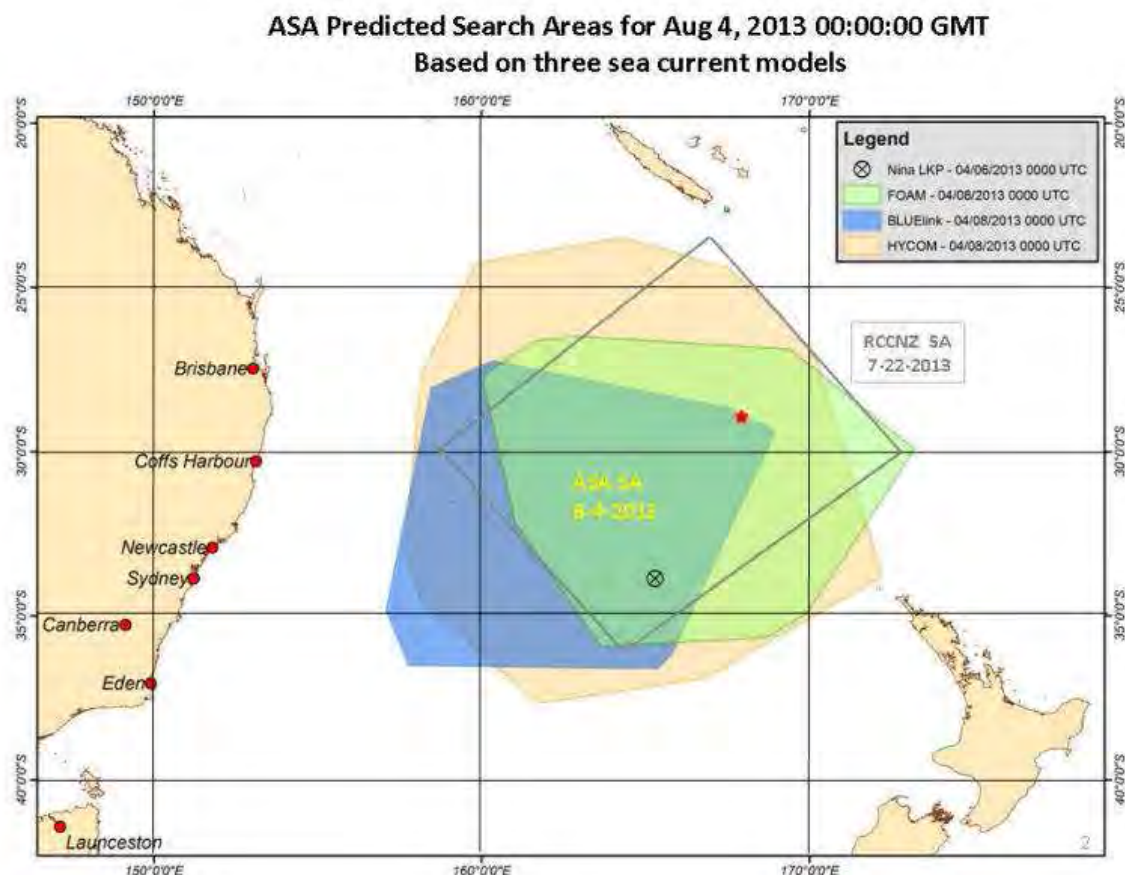
We want you to consider the merits of continuing the search for the SV Nina as an intact schooner without sails and adrift within the search area SA-701 as shown; if the crew survived day 5 after June 4, they most likely are alive and surviving today. We have found zero evidence that the ship has sunk. Our dedicated team here is providing a separate document to the US State Department to fulfill their promise to conduct an earth satellite search and analysis this week. We shall send you a copy.

We also have attracted the interest of a private satellite services corporation and we plan to meet with them at their European offices in Toulouse France on this Tuesday.

It is our intent to share with you all that we learn from these efforts by our professional volunteers and others who have assisted in this search for the 7 aboard the SV Nina.

Ralph Baird

TEXAS EQUUSEARCH



Ralph,

Thank you very much for your latest information. What you have provided is interesting, however, you mention improvements in the software (SARMAP). Can you provide detail of what this is? Before we can further consider the information you have sent please provide the following:

Detail of the improvements to the software we currently use;

What version of SARMAP was used for your modelling;

Who did the modelling for you?

The name and contact details of the person you were dealing with in ASA;

Details of the date, time (in UTC) and latitude and longitude of the LKP used for your latest modelling;

Information on the current and wind datasets used for your modelling. If these datasets differ from what we used we need to know the detail and source of this data.

Confirmation that you have run models for each of the SADs developed by RCCNZ and compared the results from each system, then overlaid the areas actually searched to determine if any areas that could have been searched were overlooked.

We would need to see the results of all of the above before we consider taking your request further.

You mention you have found zero evidence that NINA has sunk. While I understand the need to remain positive there is also the need to be realistic so I think you should also consider this from the other end. NINA was being subjected to a severe storm on 4 June 2013; NINA has not communicated by satellite telephone since just before mid-day on 4 June 2013 (NZ time), despite a text message (undelivered) that clearly stated an intention to provide an update six hours later; the SPOT satellite personal tracking device has not been used since before 4 June; NINA did not respond

to calls from searching aircraft on marine VHF channels; there have been no reports of sightings of NINA from vessels despite broadcasts being made many times daily since 14 June; and NINA's distress beacon has not been detected.

We look forward to hearing from you.

Kind regards

John

John Seward | Operations Manager RCCNZ

From: Ralph Baird [REDACTED]

Sent: Tuesday, 6 August 2013 1:15 p.m.

To: John Seward; OpsOfficerRCCNZ; Nigel Clifford; 'John Funnell'

Subject: FW: FW: New Information for Search for SV Nina RE: RCC0401/13 SAR SITREP THIRTEEN

John,

Good afternoon. Thank you for your response and questions.

Jerry Borrer answers the questions you asked below. Please let me know what more you need to approve the resumption of search by RAFNZ Orion aircraft radar and/or visual air search. Basically there is an area previously reached we wish to research and an area directly to the north of area previously reported search by RCCNZ.

If you were to recommend this what would be your search parameters? Lacking your assistance the families are planning slower and more complicated private visual air search across this primary search area.

Tomorrow we shall be meeting with Astrium HQ in Toulouse, France to confirm earth satellite imaging and analysis over the subject search areas. This imaging capture and pattern recognition process is a one to three day process of acquisition and analysis.

Thanks,

Ralph

-----From Jerry:

Ralph,

Here are the answers to John's questions:

I first corresponded with Brian King on July 25th, 2013. Mr. King is the Principal Oceanographer and Managing Director of Asia-Pacific Applied Science Associates (APASA) located in Queensland Australia. Mr. King passed my request to Ben Brushett who is the Coastal Engineer at APASA. Mr. Brushett has been doing research in the application of multiple sea current models with which to improve SARMAP's results. He has experience with SAR issues in the Tasman sea. Brushett has seen improvement in the SARMAP performance. His research is not completed yet and therefore has not been incorporated into SARMAP as a commercial package. He has found that when the drift model results from different currents overlap then the probability of locating the vessel improves.

Brushett used the BLUELINK, FOAM, and HYPO sea current models on the drift analysis he did for us on August 3rd. He used the GFS wind model. Mr Brushett provided his results in the following formats: png of the overlayed models, avi videos of each model and their combinations, and shapefiles.

All of these files are on your ftp site. Here is the information and parameters that I provided Mr. Brushett:

Burgess "Nina" Specifications:

*LOA: 70' 0" * LOD: 59' 0" * LWL: 50' 0" * Beam: 14' 10" * Draft: 9'*

*7" * Displacement: 44 Tons * Ballast: Rig: B-Schooner * Designer:*

*W. Starling Burgess Built by: Biggalow Ship Yard, Cape Cod, Mass * Original*

*Owner: Paul Hammond * Year Built: 1928 Restored By: * Boat Location: * Current Name: Nina **
Current Owner: Rosemary & David N. Dyche

Drift Case Parameters:

- * SV Nina adrift in an upright position.*
- o Please use a track line of 4 knots at 310 degrees which was reported in the last text message from the Nina.*
- * Storm sails were shredded during a storm on June 1st or 2nd, so assume no sails*
- * Start Date and time is June 3rd 23:50:00 UTC*
- * Last Known Position reported by the crew was 33° 53' S by 165° 18' E*

Here is the contact information for Ben Brushett:

Ben Amon Brushett BEng (Hons)

(address deleted by reviewer)

I think this answers most of John's questions. I have attached the png of the overlap from the three current models plus a comparison to the last model provided to us from John Seward.

Jerry Borrer

Search Coordinator

Texas Equusearch Search and Recovery

Good afternoon Ralph,

Thank you for all the information, and please thank Jerry for providing the answers to most of my questions. Unfortunately your work has not provided new information that would justify resumption of the search for NINA.

It is important to know that the SARMAP modelling done by APASA and RCCNZ used the same "engine" in SARMAP, the same HYCOM current data, the same GFS wind files and the same LKP. It should be no surprise that the end result is almost identical. APASA also ran the models with BLUELink and FOAM current data. The areas that these models produced fall within the area produced when using HYCOM so were covered by our modelling.

It is also important to understand that we have run the model from the "crew" LKP out to the date/time of the searches for NINA by the RNZAF P3K2 Orion on 26 June 2013 and 4 July 2013 and, in each case, the searches covered those areas predicted by the model run.

The accuracy of drift models decreases with time elapsed from the start date and time. To now pick where to search from a model that covers 65 days is a matter of guesswork and cannot be validated by the probability grid that can be applied with reasonable confidence to a model that is run over a shorter period. It is for that reason that I, unfortunately, cannot answer your question about where to look now.

Given that we have checked extensively with APASA the work that they did for you and that there is no new information to work with we cannot support your request to recommence the official search for NINA and its crew. I know we all would wish that my response could have been more encouraging.

Kind regards

John

John Seward | Operations Manager RCCNZ

John,

We want to make a formal request. This was our original plan. Let me know who the right contact is and the best way to present this request. We want to pay the fuel expenses and incremental operating costs of the NZ operated Orion P3K to acquire radar and visual flight data in the area just to the north of the LKP used by RCCNZ on its July 4 flight; and also extend the air search into the water covered areas between Lord Howe Island and Norfolk Island. I have figured the costs but need your advice to take the next step.

Thanks for your help and will look forward to hearing back from you.

Regards,

Ralph

Good evening Ralph,

I understand your desire to remain positive. Nevertheless, however you choose to progress your request it will come back to RCCNZ for professional operational input. To help us help you I need to know the following:

What are you searching for?

What is your rationale for doing so?

What specific area do you want searched?

On what basis have you developed this search area?

On the basis of the information currently available to RCCNZ I can not, on an operational basis, support a request to recommence the official search, or your latest request to provide New Zealand assets to support the private search. Your responses to my questions above are therefore very important to you in regard to trying to take your request forward.

Kind regards

John

John Seward | Operations Manager RCCNZ

15.13 GEOINT response

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GEOINT response starts on next page.



GEOINT NEW ZEALAND

PAGE 1 OF 1

GEOINT Report

21 October 2013

(U) Tasman Sea: Possible Indication of the Schooner Nina

(U) Executive Summary

1. (U) GEOINT New Zealand was able to analyse the original DigitalGlobe satellite image dated 15 Sept 2013. The poor resolution of the image makes it impossible to draw an unequivocal determination about the identified feature. However, after exhaustive analysis, GNZ believe that it is highly unlikely that the identified subject in the imagery dated 15 September 2013 is that of the schooner Nina.

(U) Analytical Methodology

2. (U) By comparing shadow and highlight detail of the subject reported, against known points on the Nina, analysis found there was little to no correlation between the subject in the imagery and the Nina's known dimensions.

(U) Assessment

3. (U) It is assessed that the subject reported within the imagery dated 15 September 2013 is unlikely to be that of the vessel Nina.

(U) Author/Contact Details

(U) GEOINT Team, NZDF GEOINT New Zealand (GNZ), Imagery Analyst.

(U) Release Authority

(U) NZDF GEOINT New Zealand (GNZ)
Director GNZ, DTelN: (397) 7001; DDI: +64 9 445 5001

Location	Tasman Sea
Coordinates	28°47'03"S 164°27'22"E

Further reuse or dissemination of this information requires written approval of GNZ

**NEW ZEALAND DEFENCE FORCE***Te Ope Kaatua o Aotearoa***GEOINT NEW ZEALAND**

Private Bag 32901, Devonport, Auckland 0744, New Zealand
Telephone: 64 (09) 445 5001, Facsimile: 64 (09) 445 5589, Email: [REDACTED]



GNZ 3235/1

03 February 2014

Mr. Nigel Clifford, General Manager Safety and Response Services
Maritime New Zealand (MNZ)
Level 10, Optimisation House
1 Grey Street
Wellington 6011

Nigel,

In response to your email message of 29 January 2014, please accept this response providing additional details about the analysis of the identified feature purported to be the schooner SV Niña as provided to MNZ in the accompanying Annex.

The identified feature, at 28° 47' 03"S, 164° 27' 22"E, appeared on a commercially-available satellite image from DigitalGlobe dated 15 September 2013. The full original image including the feature was captured by the Quickbird satellite and covers over 700 sq km of the Tasman Sea; such a wide capture area resulted in fairly low resolution. The sea state and wind speeds in the area at the time of capture also resulted in an extraordinarily high number of probable wavetops throughout the image.

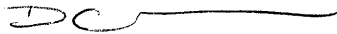
The low resolution of the original image equates to approximately 1.5 m pixel size and makes it impossible to make a definitive conclusion about the identified feature especially given its small size. Therefore any conclusion about the identified feature reached through analysis of an image at this low resolution can only be achieved through probability. As noted in the accompanying Annex, the identified feature on the original satellite image was compared with plans of the SV Niña. The light and dark patterns on the identified feature do not correspond with known points on the SV Niña. In addition, the processing undertaken to geo-rectify the satellite image for GIS applications (such as GoogleEarth and ArcGIS) caused a degree of distortion (or 'stretching') that affected the appearance of the identified feature. When viewing the unprocessed (or 'flat') image, the identified feature does not conform to the shape or dimensions of the SV Niña.

Based on extensive analysis undertaken by several experienced GNZ imagery experts, it was concluded in the Annex that it was highly unlikely that the identified feature at 28° 47' 03"S, 164° 27' 22"E on the 15 September satellite image was the SV Niña. Our analysis concluded:

The probability that the identified feature was the SV Niña = < 1%.
The probability that the identified feature was a wavetop = >90%.

If GNZ can be of any further assistance to MNZ please let us know.

Kind regards,



D. CROSSMAN
CDR, RNZN
Director GEOINT NZ

Annex: (Unclassified) GNZ GEOINT Report to MNZ, 21 October 2013 '(U)
Tasman Sea: Possible Indication of the Schooner Nina'