

Review Report

# Capsize of the racing yacht, *Nexba*

23 July 2023



## The Royal Prince Alfred Yacht Club

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# 1. INTRODUCTION

## Summary

- 1.1 The racing yacht, *Nexba*, capsized in moderate wind and wave conditions near the Wollongong coast in the early hours of 2 July 2022 with two persons onboard. The skipper and co-skipper escaped from the capsized cockpit and cabin respectively into the sea and remained with the upturned yacht until rescued by HMAS *Brisbane's* rescue craft approximately 14 hours after the capsize. The yacht was found ashore on 3 July 2022 without its keel and mast.
- 1.2 *Nexba* commenced a return voyage from its home club, Royal Prince Alfred Yacht Club (RPAYC), to a waypoint near Wollongong on 1 July 2022. The reason was as an offshore qualifying passage of 100 nm for the two-handed division of the Sydney Gold Coast Yacht Race, scheduled for 30 July 2022. The yacht capsized at approximately 01:15 (last known position) on 2 July after the separation of the keel from the yacht. The two sailors were successfully rescued at approximately 15:30 on 2 July.

## This Review Report

- 1.3 Whilst the yacht was not at the time participating in an organised race, those involved, the RPAYC and Australian Sailing agreed that aspects of the incident may be relevant to increasing the safety in the sport. This is consistent with the bounds of the RPAYC Terms of Reference of 5 September 2022 for this review (refer [Appendix A](#)). For this reason, this report was written to be publicly available, to contribute to safety in the sailing community and industry.
- 1.4 However, this review does not investigate the potential cause(s) of the loss of *Nexba's* keel. The authors of this report are not aware of any specific findings on the keel loss or the details of any parallel reviews that may be underway by authorities, insurers, design and/or build parties.
- 1.5 The Review Working Party was selected by the RPAYC from volunteers of the club with a range of experience in offshore racing, two-handed racing, yachting industry and safety engineering, as expanded in [Appendix B](#). Whilst the timeline of the report preparation has been lengthy, it initially allowed for pre-existing commitments of those involved in the incident, and for access to authority records. Of note, the interviews began as soon as practicable after release of the terms of reference to ensure information was fresh in the minds of those involved.
- 1.6 This report aims to provide an account of the circumstances relating to the capsize of *Nexba* and the survival of the sailors. It includes lessons learned by those involved in the incident as a direct contribution to improved safety of the wider sailing community. It aligns with World Sailing's, *Guidelines for Independent Incident Reviews and Reporting* [1] as far as possible which notes:

*The review should not apportion blame on any person or organization.*
- 1.7 This report identifies several factors contributing to the survival of the sailors (skipper and co-skipper) and makes recommendations for two-handed sailors undertaking these types of voyages. Some recommendations may be relevant to larger racing crews and the cruising yacht communities and can be considered for their specific circumstances.

## 2. FACTUAL INFORMATION

### 2.1 Yacht Particulars

2.1.1 *Nexba* was the first of the 30 ft Farr X2 series (Hull #1), designed by Farr Yacht Design with the boat manufactured in Indonesia by XSP-Xtreme Sailing Projects. The Farr X2 series was designed with offshore racing in mind, including for short-handed sailing. Particulars are listed in *Table 1*.

2.1.2 The owner ordered *Nexba* in September 2020 from Vicsail. After building the hull, it was shipped to Australia for commissioning by Farr Yacht Sales Australasia on 30 March 2022. The owner was not onboard when it capsized, however the person in charge (skipper throughout this report) had periodically attended the vessel during the commissioning.

*Table 1: Farr X2 Particulars [Source [2] except where noted]*

<b>Designer</b>	Farr Yacht Design	
<b>Builder</b>	XSP-Xtreme Sailing Projects	
<b>Registration</b>	New South Wales	
<b>Home Port</b>	Royal Prince Alfred Yacht Club (RPAYC)	
<b>Length overall</b>	9.20 m (30.10 ft)	
<b>Beam</b>	3.20 m (10.50 ft)	
<b>Draft</b>	2.05 m (6.70 ft)	
<b>Displacement</b> <sup>1</sup>	2690 kg (Boat weight)	Source [3]
<b>Ballast</b>	876 kg (Bulb)	Source [3]
<b>Water Ballast</b>	256 L (x 2)	Source [3]



*Figure 1 High visibility appendages (rudders and keel) [Source: Skipper]*

<sup>1</sup> Different values for displacement and ballast are seen in the Farr X2 Specification [2] and World Sailing Certificate [5]





Figure 2 Nexba cockpit [Source: Sailors]



Figure 3 Nexba hull showing sail drive (propeller location) [4]

2.1.3 An Owner's Manual was not seen by the Working Party; however construction is described on the website [2]. Features relevant to the incident are:

- Water Ballast
- Propellor
- Rudders. A twin system arrangement with impact fuse allowing rudder to flip up if impacted.
- Tiller
- Liferaft stowage. Designed with a cockpit in-deck locker
- Auto-helm

2.1.4 **Certification.** Available for this review were:

- a. DNV, Job P33252-1, FarrX2 - World Sailing Plan Review of 25 May 2021 review against ISO 12215 lists 16 drawings (14 approved, remainder for information).
- b. World Sailing Offshore Special Regulations Certificate of Structural Plan Review Certificate: 000220-0098-S, Notified Body DNV.GL., 9 June 2021 [5], with Builder Declaration of 1 March 2022
- c. Australian Sailing, International Rating Certificate (IRC) Certificate, 47946 SHORT HANDED, of 9 June 2022 [3]
- d. AMSA Builder's Certificate, (in accordance with Shipping Registration Act), Ship's Name: Farr X2, of 1 March 2022
- e. Australian Sailing (AS) 2021-2024 Keel and Rudder Inspection Form of 27 April 2022

## 2.2 Equipment

2.2.1 The equipment carried was documented on *Nexba's* stowage chart, which is shown in Appendix C. Items relevant to the review are detailed in the analysis 4.8 as described in Australian Sailing's *Special Regulations: Part 1 for Racing Boats* [6] (Special Regs). Key safety equipment included:

- Liferaft – 4 person to ISO 9650 Type 1 Group A with Pack 2 (less than 24 hour)
- EPIRB (406 MHz) and grab bag
- 2 x Personal safety equipment (Lifejackets, PLBs, AIS personal crew overboard beacons (AIS PCOB))

2.2.2 A substantial portion of *Nexba's* hull was reported washed ashore at Austinmer beach [7] on 3 July 2022. The rigging and surrounding deck structure were not attached. The skipper's PLB was found ashore with the boat and boat's EPIRB was also found ashore.

2.2.3 The manufacturer's post-damage report of the skipper's PLB was included in records requested from AMSA under the Freedom of Information (FOI) Act [7].

## 2.3 Environmental Conditions

2.3.1 Wind observations were obtained from the Bureau of Meteorology's (BOM) wind records (half hourly averages) at several weather stations along the voyage [8]. Wave readings were obtained from the Department of Planning and Environment's (DPE) Sydney Waverider buoy [9]. Both wind and wave readings are overlaid on the timeline of Appendix D, with key points summarised below and their locations shown in Appendix E. Wind descriptions are given in knots (kn), and average wave heights in metres (m).

2.3.2 The sailors noted that the BOM forecast at the time of departure for Sat 2 July was for a Strong Wind Warning: *Winds averaging from 26 knots and up to 33 knots*. BOM records show less than 10 kn wind before sunset on 1 July. At Bellambi at the time of the capsize (01:00-01:30) 2 July, wind of between 11 and 13 kn was recorded. Wind speed did not increase until 05:00, through to a 26 kn average at 2 July 07:00. Winds then remained averaging 26 to 32 kn through until the rescue [8].

2.3.3 Wave records were not available from the Port Kembla wave buoy for the relevant dates due to damage, therefore Sydney wave buoy readings are used for context only<sup>2</sup>. The mean wave height built from approximately 1.5 m around sunset 1 July to 2 m around the time of capsize. It then rose to between 2.5 and 3 m by the time the rescue was undertaken [9].

2.3.4 The sailors were told the water temperature was 21 degrees.

2.3.5 Visibility is noted in the sequence of events as given by rescue organisations, including vessels and aircraft.

## 2.4 Records, Times and Locations

2.4.1 All times are given in local Australian Eastern Standard Time (AEST), in 24 hour format, hh:mm.

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<sup>2</sup> The approximate water depths at these buoy locations are Sydney 90 m and Port Kembla in 80 m.

- 2.4.2 Key timeline facts, locations and rescue asset involvement were obtained from AMSA under the FOI Act [7] which includes their *Response Centre Consolidated Incident Timeline*. This includes information in 3. *Sequence of Events* and the key times superimposed on the timeline of Appendix D.
- 2.4.3 *Nexba's* voyage track and the positions of ships in the vicinity of the capsize were established from Automatic Identification System (AIS) records held on AMSA's *Spatial@AMSA* website [10], and are displayed in Appendix E. AMSA remove the digital identification data from these records before publication. These are the only records that match the voyage of *Nexba* and show two ships in the vicinity at the time and considered to be relevant.
- 2.4.4 Select communication records have been included in the sequence of events from the sailors' and their supporters' phones, and from AMSA's timeline (noted above) [11] [12].
- 2.4.5 Documentation for the Noakes Sydney Gold Coast Yacht Race [13] as organised by the Cruising Yacht Club of Australia (CYCA) is included in the analysis 4.1 Races versus Qualifiers.

### 3. SEQUENCE OF EVENTS

This section describes the main events that occurred between the yacht's arrival in Australia through until the capsize and subsequent rescue. It was compiled through interviews with the owner, sailors (skipper and co-skipper) and shore-based contacts [11], [12], [14]; and AMSA's records [7].

#### 3.1 Lead Up to the Voyage

- 3.1.1 *Nexba* arrived in Australia on 30 March 2022 for commissioning. Key events prior to delivery were a waterline test on 6 April, the launch on 29 April and a test sail with owner on 11 May. The delivery passage (with owner and project manager) to RPAYC, Newport was sailed on 20 May in moderate seas.
- 3.1.2 During May and June 2022, commissioning work continued at RPAYC to get the boat seaworthy. Throughout the period the yacht was sailed by owner, skipper and co-skipper in various conditions, with no significant events. This had been 2 to 3 times weekly and included off Broken Bay in bumpy weather. Trials also included to Long Reef and to Terrigal in 20 and 30 kn winds respectively and 2 m seas. Certain issues addressed during the commissioning included: water ballast tank leaks, insecure stanchion and safety rail attachments, deck fitting attachment leaks, diesel engine coughing and blowing black smoke, cockpit pad eye for jackstay.
- 3.1.3 From Thu 23 to Tue 28 June the sailors arranged a full-time preparation period and focused on training and readying the boat for the 100 nm Gold Coast Race qualifier (details in 4.1.2). Their aim regarding safety equipment was to meet Category 1 requirements, which they considered essential for the qualifier and for two-handed sailing. Whilst they had hoped to do the qualifier that weekend (25 to 26 June), they were still waiting for the stanchion work and some safety equipment (although several items had already been received and fitted).
- 3.1.4 On Mon 27 June a safety auditor was informally consulted on the status of the boat's equipment against Category 1 requirements and various other emergency responses were discussed. A draft audit checklist was prepared, noting their Category 1 safety audit through RPAYC was booked for 8 July.
- 3.1.5 On Tue 28 June, the sailors trained in 2-3 m seas with wind up to 25 kn and noticed a significant amount of diesel in the bilge. They arranged for a qualified marine diesel mechanic to address the diesel engine.
- 3.1.6 During the week that led to the voyage, the skipper, with co-skipper input, assessed the route plan daily, which included navigation and weather forecasts. Predictions for 2 July for a strong wind warning from the south influenced their decision to sail south toward Wollongong rather than north. They considered this course to have better options to seek refuge (coastal shelter) if the weather arrived earlier than expected, and a more suitable return wind direction. On the morning of 1 July, routing outputs were calculated based on several wind and wave predictions. These suggested the planned route would not see more than 18 kn wind, with a Pittwater arrival time between 07:00 and 11:00 or 12:00 on 2 July. They agreed they would need to leave by 15:00 on 1 July.



- 3.1.7 On Wed 29 and Thu 30 June the final safety equipment arrived at RPAYC. The sailors met on the evening of 30 June and decided the safety equipment was ready for the qualifier and they were confident they could complete the passage before the weather front hit late Saturday afternoon.
- 3.1.8 At about 07:00 on Fri 1 July the sailors met at RPAYC and conducted a weather and safety brief, which included the forecast weather front and final equipment checks on the boat. They confirmed a 3 hourly watch schedule to start at 16:00 (this included 1 hour standby and 2 hours off). The planned on-watches included: 16:00-19:00 skipper; 19:00-22:00 co-skipper; 22:00-01:00 skipper; 01:00-04:00 co-skipper. A watch change checklist had already been prepared and was displayed onboard.
- 3.1.9 Also on the morning of 1 July, the marine diesel engine mechanic's inspection was completed with a fuel gauge attachment reseal (associated with the fuel leakage) and future investigation planned on the alternator. The mechanic recommended a service in coming weeks to reduce the black smoke from the engine. It was confirmed the boat's stanchions and safety rails had been secured, and jackstay and tether points fitted, whilst the water ballast leak remained outstanding. The jacklines were fitted in place and equipment stowed.
- 3.1.10 Outstanding boat works were assessed, including the diesel mechanic's input and the effectiveness of the bilge pumps (electric and manual) for managing the water ballast leaks. Pumping the bilges was included in the watch change-over routines. This had been tested during training sessions and was considered manageable for the qualifier. On the morning of Fri 1 July the project manager also notified the sailors of an out-of-water keel inspection from the previous morning, which had been triggered after a regular diver cleaning of the hull had noted some wear around the keel slot. The sailors were reassured by the project manager that the boat was seaworthy to undertake the qualifier.
- 3.1.11 The sailors confirmed that the safety equipment was onboard and accessible, and that the boat's Emergency Position Indicating Radio Beacon (EPIRB) and their Personal Locator Beacons (PLB) were registered. They had lunch at RPAYC and re-confirmed weather and routing. The BOM forecast for a Strong Wind Warning (refer 2.3) was double-checked and noted to be a common condition in ocean races. Training sessions had included the control and depowering of the boat in similar conditions. They changed into sailing clothing and stowed their own gear onboard.

## 3.2 Lead Up to the Incident

- 3.2.1 At about 13:45 *Nexba* left the dock of RPAYC. The co-skipper closed all watertight bulkhead caps and checked that the sea cocks were closed. The skipper registered the voyage details with the app *Marine Rescue NSW* (details in 4.1). While they motored north through Pittwater, Marine Rescue NSW called the skipper's mobile phone to confirm that the predicted strong wind warning was known to them, which they acknowledged. The skipper phoned a family member to confirm the diesel mechanic's inspection, the previous day's keel inspection and confirm that the safety equipment was in place. The skipper also spoke with the safety equipment supplier to confirm that the EPIRB was registered and that they had received all their safety gear. The co-skipper told family when they were going and what time they'd return. While they motored out of Pittwater, the sailors agreed to take it easy on the boat (noting it wasn't a race) and discussed their sailing approach. This included: sail options, weather checks (with Zeus, Expedition and a deck screen) for updates; and their turn around waypoint near Wollongong and timing.
- 3.2.2 The sailors left Pittwater and rounded Barrenjoey Head at about 15:30, with lifejackets, safety bum bags and headtorches worn, and VHF Channel 16 on. They sailed on starboard tack with the wind from the WSW around 10 to 15 kn at about 60° true wind angle (TWA). The wind angle tightened to 40° TWA as the wind shifted south. In about 12 kn wind, they sailed at about 5 to 6 kn and put a reef in the mainsail. The seaway was noted as 1 to 2 m from the ESE. They alternated between a full and reefed mainsail.
- 3.2.3 Once night fell, they agreed to leave the reef in and if the wind lightened, they would empty the water ballast. They regularly checked the weather data against what they saw on the water. The windiest conditions were encountered as they passed Sydney harbour, at about 20 kn for around 10 minutes. They stayed on the same starboard tack until the wind shifted further to the SE, when they tacked to port. Through the co-skipper's watch (20:30-22:30) they used the water ballast multiple times as wind strengths fluctuated.



- 3.2.4 During the skipper's watch, between 23:00 and 0:00, winds eased significantly and they alternated between sailing and motor sailing for comfort. The reef remained in, with no water ballast, as the wind shifted to NE around 10 to 15 kn, and they sailed at about 120° TWA. At about 0:40, about 20 minutes before the watch change, in about 10 kn wind and an easterly sea state of 1 to 2 m, the skipper noticed the boat motion had changed. It tended to round up in wind puffs of 12 kn, which was unusual in those conditions and sail set-up. The boat wouldn't bear away and the co-skipper was called on deck to try the helm. They noted the main wouldn't ease, and found the runners wrapped around the boom. Once clear, the boat appeared to behave normally.
- 3.2.5 Soon after, near their return waypoint, it was decided to prepare to turn for the return leg and to tack the boat. The skipper (on helm and main) attempted to tack the boat in 8 to 12 kn wind and moderate sea state with the co-skipper on the jib. After two or three attempts, unable to manoeuvre through head to wind with the bow head on to waves, they swapped helming roles and the co-skipper tried two more times. The skipper felt the rudders seemed to stall, but as it was not windy, they decided to do slow and gentle gybe to turn the boat and change course for the return, which was successful.
- 3.2.6 While the co-skipper was still on the helm, the skipper checked the navigation route to confirm their course. The boat was on starboard tack and felt normal again and the sailors believed their difficulty tacking to be the light wind combined with head-on waves. They considered themselves 6 nm offshore and could see the lights of ships off Wollongong.
- 3.2.7 The wind then lightened to an unsettled shifting breeze before the boat settled in the light wind and confused sea state. The skipper switched the engine on to motor-sail through a light patch.
- 3.2.8 The co-skipper noticed a little bit of water had come up through the floorboards. This was more water than had been seen previously, but not unexpected given the leaks from the water ballast and its use several times on the voyage. The electric bilge pump was run to clear the water, and some diesel in the bilge was noted.
- 3.2.9 The boat then gybed itself to port tack through shifty winds and was on the right course for the return leg. The wind settled to 10 to 12 kn, the skipper folded the propeller and turned the engine to neutral to charge batteries.

### 3.3 The Capsize

- 3.3.1 The co-skipper returned below to prepare to take the 01:00 watch and swap to warmer outer clothing. This involved the temporary removal of lifejacket, bum bag, hat and headtorch to change from a lighter to heavier weight smock. Within seconds of the removal of the safety equipment, an unexpected boat movement tossed the co-skipper from windward to leeward in the cabin below. Water rushed into the cabin and quickly filled to waist deep.
- 3.3.2 Meanwhile, on deck the skipper remained tethered to the jacklines by harness. A 12 to 13 kn wind puff loaded up the mainsail and the mainsheet was dumped as the boat continued to round up. As the boat broached to 90 degrees, the skipper also fell from windward to leeward, but remained attached with the harness tether. The boat remained knocked down longer than usual, and so the skipper reached forward to the liferaft locker, expecting the boat to right itself. During the broach the skipper warned the co-skipper about moving to avoid being hit or thrown around. The hull then quickly continued to roll toward capsize (invert), and with the liferaft in hand it was dropped to avoid the skipper being hit or trapped by the inverting hull. After being thrown across and outside of the boat's lifelines, the skipper remained tethered to the jackline, with automatically inflated lifejacket. The liferaft remained trapped under the hull.
- 3.3.3 The co-skipper faced rapid water ingress to the cabin and was unable to locate any air pockets to remain below. Running short of air and disoriented, attempts were made to release the boat EPIRB and grab bag from their locations adjacent to the companionway. With limited air remaining, and with no visible air pockets, the co-skipper swam from the underwater cabin. No air was found trapped in the cockpit, so the escape was a continued swim the length of the cockpit to surface near the transom and skipper.
- 3.3.4 With the hull inverted, the keel was seen to be missing. At 01:16, AIS records show *Nexba's* last known position (LKP) at 34.39767 S, 151.0515 E.

### 3.4 Survival

- 3.4.1 The co-skipper surfaced, grabbed the rudder and coughed up and was sick with the swallowed salt-water and diesel mixture. They secured themselves together using the skipper's double-tethered harness which remained attached to the bouncing boat. They looked for the liferaft and realised it was trapped under the boat. It was apparent too that the co-skipper's lifejacket and bum bag (with PLB and AIS PCOB) remained in the cabin.
- 3.4.2 The skipper, when accessing the PLB (in bum bag) to activate it, held the boat and co-skipper. The AIS PCOB, attached to the same line in the bum bag, became detached and floated away. While releasing the antenna, the green light flickered, but the antenna had not fully extended and as it extended further, it broke away. The co-skipper then held the PLB clear while they were tethered together and attached to the yacht. Eventually they tied the PLB to a rope to avoid losing it and later double-checked it had gone off, as indicated by its lights.
- 3.4.3 The co-skipper attempted to telephone support persons from a phone call-enabled smartwatch, however these calls did not connect.
- 3.4.4 The life sling on the aft guardrail had become loose, so the skipper accessed this and put it around the co-skipper, who was without a lifejacket. The life sling's floating rope was also used to harness the co-skipper to the boat and the skipper.
- 3.4.5 They remained together at the boat's transom and were later able to climb up using the aft guardrail to spend time on the rudders (cassettes) and held onto the rudder. As the sea state built, first one rudder fuse blew and the rudder came down. They then moved to the other side's rudder, which eventually blew. They aimed to get further out of the waves and onto the hull (near the propeller) to reduce their wave and in-water exposure, which proved difficult as it was dark, wavy and slippery. They attempted unsuccessfully to lasso the propeller with a weight (head-torch) on a rope to climb onto the hull. They were on one rudder each, with locked feet in the aft guardrails and the rudder bars. The skipper set a 15 minute schedule using a watch alarm to check their attachments to both each and the boat. During their time on the rudders, the co-skipper was repeatedly knocked off into the water and became fatigued, climbing back with each blow, about every 15 minutes, and continued to swallow water. The life sling foam part eventually snapped.
- 3.4.6 During the night hours, they were hopeful that they would be rescued in daylight. They saw ship lights but did not think they were moving toward them. After daybreak (approximately 07:00), the sailors saw a large ship approach, and whilst near the yacht rudders, they waved and shouted for help. The ship altered course away from *Nexba* and went past slowly. By 07:00, the wind conditions at Bellambi had doubled to about 26 kn (from 13 kn at 05:00), and the direction shifted at about 05:00 to SE (from SW until 03:00).
- 3.4.7 By about 11:00, after many hours near the transom, in worsening conditions the sailors became fatigued. They decided to make greater efforts to move to the hull high point at the folding propeller. In a break in the weather, the co-skipper was able to run up onto the hull, with a push from the skipper, and tied onto the sail drive. The skipper soon followed with the assistance of the rope. The co-skipper sat nearest the propeller (seen in Figure 3), with the skipper huddled around for warmth and protection.
- 3.4.8 They were hopeful that the PLB had gone off, which now floated at the back of the boat, tangled in lines. Earlier attempts to detangle it or cut it free were stopped due to the risk of losing the PLB. Later ideas to retrieve the PLB were considered too risky with the rudders now loose and moving around dangerously at the back of the boat. The rudders later fell off the boat. As they noted the amount of time since the PLB activation, the sailors presumed it didn't fully function and started to become desperate, as no rescuers had appeared. While they waited, and thought the boat may sink, they cut part of the skipper's life jacket hood to plug the keel bolt holes.



*Figure 4 Rudders shown in inverted orientation*

- 3.4.9 The co-skipper reconsidered the phone call enabled-smartwatch and it being worth another attempt. They dialled 112 with no effect, then dialled 000 and made a connection. The skipper was able communicate their situation and general location and give a mobile number for next of kin for follow-up. They were unable to hear the responses at the other end of the call. The skipper then read their co-ordinates off a GPS-enabled watch at the time the phone-watch went flat. Records relayed to AMSA show this call at 12:57.
- 3.4.10 As conditions deteriorated with waves increasing in size, the sailors believed they were moving out to sea. It had started to rain and visibility was reduced. They saw a couple of ships in the distance but were unable to get their attention by waving and shouting. At one point the skipper (in high visibility lifejacket) stood up on the upturned hull, held by the co-skipper.
- 3.4.11 In desperation, the co-skipper then made at least three attempts to dive under the boat to retrieve safety equipment such as the EPIRB (with a rope attached to wet-weather pants). The air needed, the degree of fatigue and the drag of seaboots prevented access to the cabin. The co-skipper returned to the propeller position using the rope and skipper’s aid to rest with the intent to try again later. They believe the rig and sails were intact throughout the survival period.
- 3.4.12 The sailors then saw a helicopter pass very close to them, then turned and flew away, which, despite missing them, gave them some reassurance there may be a search underway. Recollections have this as about an hour before they were finally sighted by the cargo ship, *Arietta Lily* at 15:02 as described in section 3.5. *Arietta Lily* passed within 50 metres and was close enough for the sailors to see their facial expressions. The ship sounded its horn and stood by, moving to a safer distance. They believe *Arietta Lily* was the ship they had seen earlier in the day. HMAS *Brisbane* was then seen on approach in the distance.

## 3.5 Rescue

- 3.5.1 This timeline overlaps with the survival period as recalled by the sailors (outlined above). It is presented in summary form due to the relevant details largely extracted from AMSA records [7]. It is supplemented with the sailors’ and supporters phone records and recollections [11] [12].

Timeline	Account	Source
<b>2 Jul 07:08</b> <b>2 Jul 10:13</b>	Marine Rescue called skipper at beginning and end of estimated arrival windows	[11]
<b>2 Jul 11:08</b>	Marine Rescue called skipper, now overdue	[11]
<b>2 Jul 11:28</b>	Marine Rescue called skipper’s next of kin	[11]
	Marine Rescue called RPAYC, who confirmed boat not back and contacted next of kin	[11]
	Skipper’s next of kin called boat’s satellite phone with no response	[11]
<b>2 Jul 11:36</b>	Next of kin called RPAYC to check whether <i>Nexba</i> back	[11]
<b>2 Jul 11:50</b>	Water Police contacted AMSA advising <i>Nexba</i> overdue	[7]
<b>2 Jul 11:57</b>	Marine Rescue called skipper	[11]
<b>2 Jul 11:59</b>	Water Police called skipper’s next of kin, noting search to start	[11]
	Co-skipper’s family searched online records for safety gear	[11]
	Skipper’s next of kin searched skipper’s car for safety gear details	
	Water Police confirmed no distress signals received from PLB records in skipper’s car	[11]
<b>2 Jul 12:04</b>	AMSA noted Search and Rescue co-ordination by Water Police	[7]
<b>2 Jul 12:49</b>	Marine Rescue called skipper	[11]
<b>2 Jul 12:57</b>	AMSA noted (at 13:58) the 000 call included: ... <i>job came in at 1257pm local today (020257UTC) OPTUS default line</i> [details removed]. <i>Informant - boat upside down informant says to call (phone number</i> [details removed] ) <i>asked to speak to</i> [details removed] <i>to help to locate</i> [details removed] <i>drifting from Wollongong for 12 hours. Capsized 2 am last night.</i> <sup>3</sup>	[7]
<b>2 Jul 13:09</b> <b>(&amp; 13:58)</b>	Water Police advised AMSA job relating to unknown caller (from 12:57) Last Known Position (LKP) 34 23.86S, 151 03.09E at 2 Jul 01:16	[7]
<b>2 Jul 13:13</b>	Marine Rescue called skipper	[11]

<sup>3</sup> Redacted information from AMSA file shown [details removed] for context.

<b>Timeline</b>	<b>Account</b>	<b>Source</b>
<b>2 Jul 13:20 or 13:22</b>	AMSA organised Distress Relay Message (Mayday) alert on HF/VHF through Charleville Radio NSW. AMSA requested Police SAR Coordinator to arrange Distress Relay Message (Mayday) alert through volunteer marine rescue bases, port authorities and fishing companies in area adjacent to incident location. AMSA noted message also broadcast on INMARSAT C SAFETYNET (Note: Message cancelled at 15:42)	[7]
<b>2 Jul 13:36 to 13:39</b>	HQJOC advised AMSA that HMAS <i>Brisbane</i> being contacted to assist. HMAS <i>Brisbane</i> advised via HQJOC best speed 45 mins to 1 hr to LKP	[7]
<b>2 Jul 13:39</b>	MV <i>Sirius Highway</i> contacted AMSA (10 nm from LKP). Reported weather conditions (SSE Force 7, Swell 5 m), visibility no more than 2 nm with 100% cloud coverage (low clouds). They could see closer ship on ECDIS.	[7]
<b>2 Jul 13:40 &amp; 14:13 and 14:33</b>	Marine Rescue called skipper	[11]
<b>2 Jul 13:40 to 13:44</b>	Search and Rescue jet Rescue 660 tasked by AMSA through to closing doors (signed off task at 15:54)	[7]
<b>2 Jul 13:43</b>	Water Police contacted AMSA regarding Lifesaver 21 including weather details similar to MV <i>Sirius Highway</i> (AMSA file note at 14:53 indicated Lifesaver 21 as police tasked helicopter) (Note: Cancelled at 15:37)	[11]
<b>2 Jul 14:08</b>	AMSA noted PLB details of co-skipper's PLB	[7] [11]
<b>2 Jul 14:13</b>	AMSA and Rapid Launch Trauma Coordinator, Ambulance Service NSW (RLTC) considered helicopter search availability (including RSCU207)	[7]
<b>2 Jul 14:43 to 14:47</b>	RLTC confirmed to AMSA RSCU204 available if required, then AMSA communication with Water Police regarding need for another helicopter	[7]
<b>2 Jul 14:56</b>	Water Police contacted AMSA regarding Lifesaver 23 and visual conditions on the scene and RSCU204 as good second aircraft	[11]
<b>2 Jul 15:02</b>	<i>Arietta Lily</i> advised HMAS <i>Brisbane</i> of sighting 2 personnel in water next to a buoy at 34 46S, 150 59E <i>Arietta Lily</i> acknowledges the sailors by sounding its horn and standing by.	[7]
<b>2 Jul 15:05</b>	HMAS <i>Brisbane</i> diverted to investigate upturned hull reported by merchant traffic (8 mins away)	[7]
<b>2 Jul 15:15 to 15:23</b>	<i>Brisbane</i> recovered 2 sailors to rescue (sea) boat at 34 2598s 15058/99e Sailors swam to rescue boat and recovered by the Navy personnel.	[7] [11]
<b>2 Jul 15:30</b>	<i>Brisbane</i> reported position of capsized yacht 34 25.85'S 150 58.90'E (reported at 17:00).	[7]
<b>2 Jul 15:35</b>	<i>Brisbane</i> sea boat transferred 2 sailors to ship	[7]
<b>2 Jul 15:37</b>	AMSA noted 2 persons recovered, undergoing medical assessment	[7]
<b>2 Jul 16:02</b>	Broadcast of upturned hull at 34 25.98S, 150 58.99E Sailors transferred to hospital	[7] [11]
<b>3 Jul 12:01</b>	The skipper's damaged PLB (washed ashore) had only transmitted one signal at approximately 12:01 h on 3 Jul	[7]

3.5.2 Under close supervision, the sailors were able to disembark the rescue boat and were monitored and assessed by HMAS *Brisbane* personnel during the time to return to Sydney. Medically, the sailors were assessed in similar condition, both with hypothermic body temperatures (approximately 32 degrees). Their blood was repeatedly tested with a chemical composition reflective of muscular overexertion (rhabdomyolysis) and monitored closely due to the risks of kidney damage. The co-skipper was later found to have a broken nose (most likely from later attempts to dive under yacht).



## 4. ANALYSIS

This section assesses the facts and events which relate to the Terms of Reference. It relies on the Special Regs [6] which addresses equipment, accommodation and training, and assumes the reader is familiar with these. It captures the considerations of the Working Party, which lead to the findings, conclusions and recommendations.

### 4.1 Races versus Qualifiers

4.1.1 Yacht racing categories define the conditions and support provided, with the two most relevant categories defined by Australian Sailing [6] as:

a. For the intended Gold Coast Race, Category 2 (Cat 2):

*2.01.3 Category 2: Offshore races of extended duration along or not far removed from shorelines or in large unprotected bays or lakes, where a high degree of self-sufficiency is required of the yachts.*

b. For future Sydney to Hobart Races, Category 1 (Cat 1):

*2.01.2 Category 1: Offshore races of long distance and well offshore, where boats must be self-sufficient for extended periods of time, capable of withstanding heavy storms and prepared to meet serious emergencies without the expectation of outside assistance.*

4.1.2 The CYCA's Gold Coast Notice of Race [13] requirements included the completion of a qualifying two-handed passage:

*3. Eligibility. A boat must satisfy the following requirements in order to have its entry accepted: ... 3.4 Crew ... 3.4.2 Two Handed boats ... (d) Both crew members shall have completed a minimum 100nm two-handed race or passage (including overnight experience) together in the boat entered.*

4.1.3 The qualifier requirements did not specifically mention:

- a. safety equipment
- b. communication monitoring support
- c. training and experience prerequisites
- d. effective rescue procedure

4.1.4 During races, the Special Regs [6] state:

a. For safety equipment that:

*2.02.1 A boat competing in category 1, 2 or 3 races shall ..., annually demonstrate to the organising authority compliance with these Special Regulations at an audit conducted by an Australian Sailing accredited Equipment Auditor.*

b. For communication that:

*2.02.4 A race committee shall arrange for constant radio monitoring of the nominated race frequency/ies while any race is in progress and for a reasonable period prior to and after the race.*

c. For training and experience in Category 2 racing that:

*2.04 CREW EXPERIENCE The number of crew specified below, including the skipper and/or person in charge shall have completed one race of the category entered or an equivalent passage. Evidence of such shall be provided if requested by the race committee. ... 2.04.1 At least half the crew.*

*3.25 MARINE RADIO ... 3.25.8 Licensed Operators: All marine radio users must be appropriately qualified. A certificate of proficiency or statement of attainment, as recognised by the Australian Communications and Media Authority (ACMA), or an internationally recognised equivalent, is required to be held by the operator for the equipment being operated in the given race category. ... (a) At least two operators for the radio equipment listed in the race category.*

*4.07.6 At least one member of the crew shall hold a current Senior First Aid (Apply First Aid/Provide First Aid) Certificate or equivalent*

*6.01 TRAINING ... 6.01.1 (b) At least 30% of the crew including the skipper or sailing master shall have undertaken training in both theoretical and practical sessions in accordance with the Australian Sailing Safety and Sea Survival Course (SSSC), or a course of no less a standard acceptable to the race committee ...*

- 4.1.5 Australian Sailing advises that best practice for clubs is the development of a risk management plan and recommends developing an incident management plan as part of this process.
- 4.1.6 For general sailing on open waters in NSW, Transport for NSW [15] have minimum equipment requirements which were compared against the Special Regs [6] requirements.

## 4.2 Planning and briefings

- 4.2.1 The sailors were aware of the forecast strong wind warning. This influenced their departure time and estimated time of arrival window which was entered into the Marine Rescue NSW app. The BOM forecast reported by the sailors aligned with the *Sydney Morning Herald's* Illawarra forecast of 1 July 2022 of: *Cloudy. Very high chance of rain, most likely in the afternoon and evening. The chance of a thunderstorm along the fringe. Winds SW 15 to 20 km/h turning S 15 to 25 km/h in the morning.* By 2 July 2002 the *Sydney Morning Herald's* Illawarra forecast was: *Cloudy. Very high (near 100%) chance of rain. Heavy falls possible. Winds S 20 to 30 km/h turning SE 25 to 35 km/h during the day.* Archival records of the BOM forecast were not purchased for this report.
- 4.2.2 For voyage monitoring the sailors chose to use the iPad app, *Marine Rescue NSW* (by Volunteer Marine Rescue), with an expectation that the boat was being monitored live using AIS.
- 4.2.3 Whilst their supporters had a general awareness of the voyage and expected return time, no regular two way communication schedule was in place to alert them to a failure to respond.
- 4.2.4 Distress beacons were not tested specifically as part of the pre-voyage checks. The PLB manufacturer's recommended tests that involve pulling out the antenna include:
  - a. Monthly beacon tests
  - b. Yearly GPS tests

## 4.3 Pre-capsize (keel damage) indicators

- 4.3.1 The sailors' descriptions of the boat handling (steering) in the time preceding the capsize may have indicated the lack of keel. However, noting the mixed wind and wave motions, it was not determined at which point the keel fell off.
- 4.3.2 The ongoing presence of water ballast leakage in the bilge may have disguised any potential water ingress around the keel area. Note that analysis of and familiarity with the keel detailing was beyond the scope of this review.
- 4.3.3 At the time of capsize the boat was close to empty of water ballast.

## 4.4 Post-capsize actions

- 4.4.1 The actual capsize happened so quickly the co-skipper lacked enough air for the time it would have taken to locate and release the safety equipment. "Spare air" supplies are commercially available and carried in some racing yachts.
- 4.4.2 Activation of the skipper's PLB was directly after the capsize while the sailors were closely attached and still in the water. The wave actions on their combined body weights may have affected the forces on the PLB's antenna while being deployed.
- 4.4.3 The PLB carried by the skipper was of miniaturised type with a winding retractable antenna (similar to a tape measure). It was designed and certified to ETSI EN 302 152-1 which includes:

*4.2 Functional requirements ... The satellite PLB shall be a single integral unit incorporating a primary battery and a permanently attached antenna. No part of it shall be detachable without the use of tools.*
- 4.4.4 It was noted readily available 406 MHz PLBs in Australia commonly have moving parts. Other transmission band distress beacons were noted of a more compact ruggedised design (no moving parts); however their transmission capability has not been compared in this review.
- 4.4.5 The skipper's PLB was noted to have several different indication modes in the manufacturer's user manual, using different lights and flashing sequences. This model did not include functionality to indicate a distress alert has been received.

4.4.6 The sailors themselves noted their high risk of breaking legs with the movement of rudders, and the way they locked on with feet. They also noted the high risk of entanglement when tied to a rope while diving under the boat. Diving was not risked until the chances of rescue were viewed as slim by the sailors. The difficulties in having enough air, swimming while fatigued and in sea boots led to unsuccessful attempts.

4.4.7 The sailors' phone call to 000 using a phone call-enabled smartwatch confirmed their need for search and rescue operations.

## 4.5 Two-handed considerations

4.5.1 Review of the Special Regs [6] showed minimal references to two-handed sailing.

## 4.6 Sailors' Qualifications and Experience

4.6.1 Both owner and skipper (person in charge) were aware of their responsibility to ensure the boat was seaworthy and crewed by suitably experienced, trained and fit crew.

4.6.2 Both sailors had competed in numerous Australian ocean races and were trained in first aid, marine radio and sea safety survival. The skipper was in the process of refreshing sea safety survival training at the time of the voyage. In addition, the skipper held navigation experience, and the co-skipper the Royal Yachting Association (RYA) Yachtmaster Offshore qualification.

## 4.7 Rescue aspects

4.7.1 The capsized yacht was not recognised from a large ship (assumed to be *Arietta Lily* by the sailors) or the rescue helicopter, both of which were seen by the sailors. The high-visibility colour of the underwater appendages (keel and rudders) can be seen in Figure 1. Whilst the keel colour became irrelevant after its loss, the rudders were still attached but not upright by daybreak when the sailors tried to gain the attention of a nearby ship. By 13:39 the visibility in the area was less than 2 nm in a ship's report, and by the time of the rescue, these rudders were missing. Review of World Sailing's, *2020-2021 Offshore Special Regulations: Governing Offshore Racing for Monohulls & Multihulls* [16] shows highly visible areas of pink, orange or yellow are required for multihulls (Category 1) when the boat is inverted.

4.7.2 AMSA AIS vessel tracking records [10] show two ships within a 5 nm radius of *Nexba's* last known position, since before nightfall on 1 July as displayed in Appendix E. The de-identified cargo ships were 180 m length with 30 m beam, and 229 m length with 33 m beam. The latter is the size of *Arietta Lily*; however, the review has not included contact with the ship. The sailor's accounts of large ships in the vicinity aligns with this data.

4.7.3 Input was sought from the Water Police regarding the facts and lessons learned, which has been reviewed [17]. Rescue activities need to be explicitly triggered with authorities such as NSW Water Police Marine Area Command (MAC) or AMSA Joint Rescue Coordination Centre (JRCC). These triggers include failure to respond to an arranged communication schedule (sched/sked) or failure to return from a planned voyage in the scheduled time window. The rescue operation increased in difficulty as weather conditions worsened.

## 4.8 Safety Equipment Stowage Locations

### 4.8.1 Cabin mounted or stowed

- a. **Boat's EPIRB** (mounted near companionway). This was stowed on the port side bulkhead adjacent the companionway, meeting both manufacturer's recommendations and Special Regs [6] requirements {4.18.3}<sup>4</sup>. It is assumed to have remained with the hull for some time until it was found nearby ashore.
- b. **Boat's grab bag**. This contained several critical items that could have initiated a distress alert (spare PLB) or given better visual communication (such as flashlights or laser lights) or sound signals (foghorn) to nearby ships and aircraft.<sup>5</sup> It contained:
  - Portable safety equipment generally: Emergency VHF antenna {3.25.5}, Foghorn {4.08}, Knife {4.15.3}, V sheet (distress) {4.27}
  - Portable safety equipment recommended for grab bag: Floating flashlight {4.06.1}, Handheld GPS

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<sup>4</sup> Items shown {#.#} reference the regulation identifiers in Special Regs [6]

<sup>5</sup> The boat's grab bag and the in-cabin portable items were missing when the boat was found ashore.

and batteries {4.11.2}

- Grab bag recommended contents: GPS capable 406 MHz PLB {4.20.2(d)}, Emergency water {4.20.2(e)}
- Additional safety equipment: 2 Laser lights

c. **Communications and Navigation Equipment.** This included:

- Satellite phone and satellite hotspot
- VHF transceiver (with AIS and DSC capability)
- Navigation and backup laptop systems including charts
- Backup navigation tablet in waterproof case

d. **Flares** (6 red parachute, 4 red hand, 2 white hand, 2 orange smoke)

#### 4.8.2 In-Cabin portable and personal items <sup>2</sup>

a. **Handheld VHF radio** (on charge in cabin at time of capsize)

b. **Co-skipper's personal items** (removed briefly from body while changing) contents:

- **Bum bag** containing co-skipper's PLB and AIS PCOB, and contents similar to skipper (refer below)
- **Lifejacket** automatically inflatable type with combined harness
- **Clothing layers** including outer jacket
- **Headtorch**

c. **First Aid Kit**

#### 4.8.3 Cockpit or locker

a. **Liferaft** including safety pack. The valise packaged liferaft was stowed in an integrated liferaft locker, recessed below the cockpit, aft of the companionway, accessible from a side hinged and latched cover. Its equipment pack was of ISO 9650 less than 24 hour type (Pack 2, <24 h) which requires the inclusion of at least: three red hand flares, two red parachute flares, two thermal protective aids, signalling mirror and drinking water.

#### 4.8.4 On Deck portable items

a. **Portable Equipment** fitted to aft guardrail, were stored in readily accessible cockpit locations.

- **Life Sling**
- **Lifebuoy** with Danbuoy (pole and flag)
- **Heaving line** (throw rope)

b. **Skipper's bum bag** (worn) contents

- Skipper's PLB
- Skipper's AIS PCOB
- Swimming cap, headtorch (worn), multitool, knife, strobe light, cyalume sticks

c. **Skipper's lifejacket and harness**

- automatically inflatable type
- combined harness type
- twin safety lines (tethers)

d. **Skipper's clothing and wearables**

- Thermals, fleeces, softshell jacket, offshore trousers and smock
- Sea boots
- GPS-enabled watch
- Headtorch

e. **Co-skipper's clothing and wearables** (after capsizing)

- Thermals, fleece mid-layer salopettes, softshell jacket, outer salopettes
- Sea boots
- Phone call-enabled smartwatch

4.8.5 Despite the suitable location of the EPIRB beside the companionway, disorientation caused by the inversion of the boat made quick-release of the EPIRB or grab bag difficult.

4.8.6 Considerations relevant to the choice of liferaft locations include:

- Whether the liferaft is available in rigid case (liferaft containers differ depending on the liferaft standard and capacity).
- The liferaft location requirements of the Special Regs [6] clause 4.19.3:



4.19.3 *Liferaft Packing and Stowage ... (a) Each liferaft shall be packed either in: (i) a rigid container securely stowed on the working deck, in the cockpit or in an open space; or (ii) a rigid container or valise securely stowed in a dedicated weather tight locker containing liferaft and abandon ship equipment only which is readily accessible and opens onto the cockpit or working deck, or transom*

- c. It was noted stowage location can affect boat trim and speed to some extent.
- d. Considerations in other incidents included liferafts being washed off in heavy seas and inaccessibility of liferafts in custom-built mounting boxes (despite transom-location).
- e. Factors other than the position that affect accessibility include: arranged to access from within cockpit for preparation; security of mountings; accessibility through lifelines or rails for inversions and ability to access after an inversion without further submergence.
- f. Whether a monohull boat uses movable ballast (not variable ballast) per Special Regs [6] clauses:

4.19.3 *Liferaft Packing and Stowage ... (c) On a multihull or on a monohull with moveable ballast the liferaft shall be readily deployable whether or not the boat is inverted*

1.01.3 **Movable Ballast.** *Lead or other material including water which has no practical function in the boat other than to increase weight and/or to influence stability and/or trim and which may be moved transversely but not varied in weight while a boat is racing.*

1.01.3 **Variable Ballast.** *Water carried for the sole purpose of influencing stability and/or trim and which may be varied in weight and/or moved while a boat is racing.*

4.8.7 Factors in determining the content of grab bags include:

- a. The grab bag's purpose in supplementing the liferaft equipment per clause 4.19.2(f) of Special Regs [6] means that its content needs tailoring to suit the chosen liferaft. In clause 4.20.1 it is noted that the grab bag is not intended to duplicate the requirements of other Special Regulations.
- b. For this voyage, a 4 person liferaft was carried with ISO 9650 (Pack 2, <24 h) provisions (refer 4.8.3a. for relevant content requirements)
- c. The recommended grab bag contents of the Special Regs [6] clause 4.20.2 overlap the requirements of several other regulations. It also introduces item terminology not found in the remaining regulations (such as Search and Rescue Transponders (SART) and white parachute flares). Inconsistencies are seen in Section 8 Appendix E Hypothermia of the Special Regs [6], which itemises separately the grab bag, visual distress signals (flares) and waterproof hand-held VHF.
- d. The recommended grab bag content contains multiple provisions of some items, which if split to another location, could be made accessible in an inversion.

4.8.8 Handheld marine VHF radios may have as little as 12 hours battery life and take as much as 7 hours to charge; therefore it is realistic that it may have been charging in the cabin during the capsize. The sailors were unable to make emergency two-way communication by fixed VHF or other Category 2 equipment.

4.8.9 The choice of lifejackets was not assessed (auto-inflating versus manual inflation), however it is noted that this involves an informed decision by all sailors, particularly when worn below-deck. In the case of this incident, the skipper's lifejacket inflated as needed when thrown into the sea. In the case of the co-skipper, had the auto-inflating lifejacket been worn as the cabin filled with water, the results can only be speculated.

4.8.10 The sailors' AIS PCOBs were stowed in personal bum-bags. By design, the AIS PCOB can be fitted within inflatable lifejackets using a mounting bracket and activation tape for automatic activation when the lifejacket inflates. If either of the AIS PCOBs were fitted into the lifejackets for automatic activation, they may have alerted the AIS equipment of nearby ships. It appears these were within a 5 nm radius (refer 4.7.2 for discussion).

4.8.11 If the AIS PCOB is not installed in a lifejacket, its location with the PLB (in a bum bag in this case), rules out its use as a back-up if they are both lost together. Separation in either the lifejacket installation option or in an on-body clothing pocket was considered preferable.

4.8.12 A recent report by the Ocean Racing Club of Victoria (ORCV), *Inadvertent Distress Beacon Activations*, [18] embeds a Personal Locator Beacon guide [19]. This includes guidance for stowing, carrying and operating PLBs. However, it is not tailored to the marine environment with limited guidance such as "Out on the water the conditions can be wide and varied".

4.8.13 The boat's EPIRB was internally located and of conventional type without float-free or automatic functionality. Float-free EPIRB arrangements are available but have specific installation requirements to both ensure functionality and avoid loss or accidental triggering. Mounting and potential stowage at the back of boat would require careful consideration due to the possibility of hydrostatic release or water activation in heavy weather conditions.

4.8.14 Whilst both the life sling and heaving line (throw rope) were used throughout the survival period, the sailors' attempts to retrieve the lifebuoy failed due to its location and buoyancy.

## 4.9 Other Incidents

4.9.1 The Working Party had general awareness of other keel loss incidents through publicly accessible reports or summaries such as:

- a. *Excalibur* on 16 Sep 2002 (Coroner's report of 16 Oct 05)
- b. *Rambler 100* on 15 Aug 2011 (reports of 25 Oct 11 and 19 Oct 12)
- c. *Cheeki Rafiki* on 16 May 2014 (report of Apr 15)
- d. *Finisterre* on 23 Feb 2018 (report of 16 Oct 18)
- e. *LCE Showtime* on 5 Jan 2020 (summary of Australian Sailing)

4.9.2 Also noted were incidents involving the loss of liferafts:

- a. *Inception* on 6 Apr 12 (reports of 14 Aug 12)
- b. *Essence* on 14 Oct 19 (report of 22 Jul 21)

## 5. FINDINGS

These findings are the opinion of the Working Party and based on the content discussed in 4. Analysis. They are grouped to address the Terms of Reference.

### 5.1 Preparation

#### 5.1.1 Sailors' Qualifications and Experience

- a. Both sailors held higher levels of experience, training and fitness than would be required to enter a Category 2 race event (detailed in 4.1.4c and 4.6).
- b. The skipper displayed the leadership expected of a person in charge during both preparation and survival periods. Both sailors satisfied themselves of the seaworthiness of the boat through consultation with specialists and seeking independent advice when needed.
- c. Both sailors were trained in and practiced valuable sea safety survival skills throughout their survival, such as: crew routines, weather forecasting, huddling for warmth and attempting to improve morale. They were prepared with full offshore clothing and relevant personal equipment as detailed in 4.8.4.

#### 5.1.2 Voyage Planning and Briefings

- a. The sailors took full account of the forecast weather (detailed in 4.2.1) and were rigorous in their planning, with updates through until time of and during the voyage. The reported BOM forecasts were more severe than newspaper forecasts show from that time.
- b. The sailors had an expectation that they were being monitored live using AIS by both Marine Rescue NSW (through the app) and their supporters.
- c. Their supporters who had noticed no movement assumed the AIS had functional issues.
- d. No regular communication schedule was in place with Marine Rescue NSW or supporters to trigger an emergency response earlier (before the arrival time window).
- e. The wind and wave conditions at the time of capsize were only moderate and within the design intent of the Farr X2. *Nexba* was planned to be sailed within conditions designed for in the FarrX2 specification [2].

#### 5.1.3 Boat Condition

- a. The sailors were aware that as the first hull of the Farr X2 class, small teething issues may be encountered in the boat commissioning. Any known issues were risk-assessed.

- b. The sailors demonstrated persistence when following through on diesel engine issues, and ensuring the stanchions were secure and the jacklines fitted before the voyage.

## 5.2 Safety Equipment – Stowage and Accessibility

- 5.2.1 The sailor's safety equipment locations are described in 4.8 *Safety Equipment Stowage Locations*, grouped into their accessibility during the incident.
  - a. The cabin mounted EPIRB and grab bag were in easily accessible locations, however in the inversion of the hull they were not able to be unclipped in time.
  - b. The portable and personal items in the cabin were similarly inaccessible (this included drinking water and food).
  - c. The liferaft was packaged in a valise, rather than rigid container, which influenced its location in the integrated locker. It was not readily deployable once the boat capsized.
  - d. Accessibility of cockpit mounted equipment was mixed from the critical use of the life sling and heaving line (throw rope), to the inaccessibility of the lifebuoy due to buoyancy.
- 5.2.2 The liferaft location was compliant with the Special Regs [6], and had no special requirement to be readily deployable in an inversion as compared with boats with movable ballast clause 4.19.3(c).
- 5.2.3 The sailors' safety equipment met or was close to meeting the Category 1 requirements of Special Regs [6]. The Category 2 audit was not completed at the time of the incident, due to the availability of Australian Sailing accredited equipment auditors.
- 5.2.4 The unfortunate timing of the capsize, while the co-skipper was getting changed, left critical personal safety items below deck during the survival period.
- 5.2.5 The speed of the capsize prevented access to critical boat safety items: the liferaft, the boat EPIRB, the boat grab bag, and the handheld VHF in the cabin charging.
- 5.2.6 The stowage together of both sailors' PLB and AIS POCB (in bum bags) contributed to the loss of one of the AIS POCBs. From a single point of failure viewpoint, separation in different pockets (or bum bag) or lifejacket installation of the AIS POCB is considered preferable.
- 5.2.7 In the case of two-handed sailing, often one person is on-deck (helming) while the other can rest. This gives little reaction time or people power in an emergency. The ability of two-handers to access and deploy the safety equipment was tested during this incident, specifically the liferaft, EPIRB and grab bag.
- 5.2.8 The content of grab bags is likely to vary depending on the interpretation of the Special Regs [6] relating to duplication. This is related to the stowage of flares (refer Special Regs 4.22.1 in a waterproof container) and the contents of the liferafts. It was noted the recommended content of regulation 4.20.2 overlaps with that of the Australian Sailing pack at Section 7 Appendix A *Equipment for USL Coastal Liferafts*.
- 5.2.9 The grab bag contained suitable emergency signalling devices (EPIRB (PLB), laser lights and foghorn) which would most likely have alerted either rescue authorities or nearby ships and rescue assets much earlier during the survival period. Despite its contents, a proportion of the grab bag contents could be split (or duplicated) into a location accessible when inverted.
- 5.2.10 The sailors' phone call to 000 using a smartwatch confirmed their need of rescue after the search had been initiated.

## 5.3 Safety Equipment – Operation and Functionality

The functionality of equipment used in the incident (listed in 4.8 *Safety Equipment Stowage Locations*) was found to have potential for improvement

- 5.3.1 EPIRBs mounted within the cabin have limited functionality in the event of a capsize, unless retrieved for manual activation. In comparison, a float-free EPIRB arrangement may be possible for two-handed sailing, however its installation would require special care.
- 5.3.2 PLB functionality indicators range between manufacturers, with individual lights' flashing sequences indicating different operations. These are complex to learn and recall in the event of an incident. After the incident the skipper learned of a PLB model with the ability to confirm distress alert receipt. The review

agreed that confirmation of their distress alert status would have been helpful in this situation, however developments in the features of communications and electronics will continue and will remain a matter for individual choice.

- 5.3.3 Boat's grab bags are recommended to contain certain safety items, taking the liferafts contents into account. The full recommendations of Special Regs [6] grab bag contents could be reviewed to ensure its total weight is still manageable by two-handed crew, considering:
- Whether SART (4.20.2(c)) is covered by EPIRB (4.20.2(d)). SART can be of type Search and Rescue Radar Transponders (SART) or AIS Search and Rescue Transmitters (AIS-SART)).
  - Whether a PLB covers the EPIRB (4.20.2(d)) requirement.
  - Whether a subset of the boat's flares (16 required for Category 1) should be packed in the bag or separately as described in Section 8 Appendix E Hypothermia of Special Regs [6].
  - Whether the boat's handheld VHF should be packed in the grab bag or separately as indicated in Section 8 Appendix E Hypothermia of the Special Regs [6].
- 5.3.4 For VHF handheld radios, noting battery life limitations, the need to recharge should be considered if they are used through the voyage, particularly when two-handed sailing. An example was found of commonly available models taking 7 hours to charge for a 12 hour battery life.
- 5.3.5 The skipper's PLB antenna did not extend smoothly and manufacturer's post-damage report shows it broke at a notch designed into the antenna. The antenna was not tested for deployment before the voyage due to the need for special tools to retract it into the housing. It is not known whether there was pre-existing damage before the voyage.
- 5.3.6 The skipper's lifejacket auto-inflated as intended and contributed to their survival.

## 5.4 Timeline of Events

Events both before and after the capsize (refer *Analysis 4.3* and *4.4*) have the potential for learnings:

- 5.4.1 The time of the keel separation was not determined based on the sailors' accounts. However, it is possible that some unusual boat handling in the time prior to the capsize may have indicated it had come off some time previous. An amount of water in the bilge cannot be specifically linked to the keel separation due to the water ballast leaks.
- 5.4.2 The boat inversion caused some disorientation hindering collection of the EPIRB and grab bag.
- 5.4.3 If "spare air" was carried, and the crew trained in its use, this may provide more time in an emergency to avoid the risk of drowning and potentially time to retrieve the safety equipment. Sailors could consider this as part of their equipment choice.
- 5.4.4 The importance of PLB activation was known and acted on as soon as possible after the capsize. The sea conditions and the sailors' close attachment may have required a model of more rugged design to be activated and function without damage.
- 5.4.5 The sailors took some calculated risks when in survival mode such as sitting on the rudders with feet amongst moving parts, and diving under the hull. However, over the course of over 14 hours their actions were a display of good seamanship and sea survival skills.
- 5.4.6 During the survival period, neither the white upturned hull nor the high visibility rudders before their detachment were visible to ships in proximity. Similarly, the skipper's lifejacket was undetectable when standing to wave in the afternoon. These were situations where the sailors could see ships but could not be seen themselves. AIS records [10] show at least two ships within 2 to 5 nm of *Nexba*'s position through hours of their survival.
- 5.4.7 Trigger points for Marine Rescue NSW involvement were the estimated time of arrival window. This aligns with follow-up communication to skipper (failed), their next of kin, and the RPAYC.



## 5.5 Safety Protocols for Qualifiers

- 5.5.1 As outlined in 4.1 *Races versus Qualifiers*, the qualifying passage required a two-handed overnight voyage of 100 nm. However, this passage requirement did not cover safety equipment, communication monitoring or training requirements. For this incident:
- The sailors were close to meeting Category 2 race requirements for safety equipment (refer 3.1.4 and 3.1.7), with the skipper in the midst of a refresher in sea safety and survival training.
  - Additional communication monitoring and incident management could have reduced the rescue period.
- 5.5.2 The yacht carried significantly more safety equipment than required by Transport for NSW [15].
- 5.5.3 The challenges of co-ordinating rescues in heavy weather were noted in Water Police input. Difficulties specifically included the increased sea state (for watercraft) and deteriorating visibility (for all rescue assets). In summary, the earlier authorities can be alerted the better; and communications schedules should take intended conditions into account.
- 5.5.4 Whilst the qualifier requirements are more onerous for two-handed boats, the Special Regs [6] show minimal tailored content for two-handed racing to address challenges described at 5.2.7.

## 6. CONCLUSIONS

### 6.1 Safety Issues Relating to the Incident

- 6.1.1 Qualifying passages are currently considered to be higher risk than similar length and category races due to lesser eligibility requirements and support provisions. In the case of *Nexba*, the sailors had met (or were close to), the Category 2 race requirements for equipment and training. Communication is discussed at 6.1.12.
- 6.1.2 The sailors' preparation, experience and qualifications all led to their survival through a period of over 14 hours in exposed and worsening sea conditions. The need for first aid, marine radio and sea safety and survival is as important for offshore (Category 1 and 2) qualifying passages as for races.
- 6.1.3 The sailors were active in monitoring the commissioning on the first of class Farr X2. Safety equipment was stored in accordance with Australian Sailing's Special Regulations [6]. This Category 2 race equipment is as important for corresponding qualifying passages as for races and substantially exceeds the Transport for NSW requirements.
- 6.1.4 Detection of the keel separation was not obvious. Some unusual boat handling may have indicated it, such as steering. Noting the darkness at the time, any lift in the boat's centre of gravity (resulting in floating higher) may have been difficult to detect in the sea state.
- 6.1.5 The speed of capsize limited the time available to escape and ability for the co-skipper to access safety equipment. The disorientation experienced also hampered the effort. Provision of spare air and training would be appropriate for two-handed crews. This could allow for the time taken to re-orient in an upturned hull.
- 6.1.6 Although the skipper's PLB functionality was in question after the antenna breakage, it was could have appeared functional due to the light indications. Memorising combinations of light indications is possible but difficult, so any design simplifications could benefit a sailor in distress. Distress beacon features (such as receipt confirmation of distress messages) develop at a pace which is difficult to regulate.
- 6.1.7 The robustness of PLBs should be considered in their selection. This notes their small size and inclusion of moving parts (covers and antennas) which potentially would be used in rough conditions. If activating, survivors should seek the steadiest positions possible to avoid damage.
- 6.1.8 The liferaft was not readily deployable with the boat inverted. Had the liferaft been accessible, its ISO 9650 pack of safety equipment would have provided extra distress signalling equipment including flares.

- 6.1.9 Valuable redundancy was lost by the stowage of the PLB and AIS PCOB together in bum bags. The automatic inflation of the sailors' lifejackets had the potential to trigger the AIS PCOB activation, which should have alerted ships in the vicinity (within 5 nm).
- 6.1.10 Access to a minimum of critical items in a grab bag accessed if a boat is inverted (such as near the transom) would provide an extra level of redundancy in unforeseen emergencies. This could be achieved by a split distribution of the grab bag contents or supplementary equipment.
- 6.1.11 Marine Rescue NSW's website and app may not have described the level of monitoring clearly enough for the sailors.
- 6.1.12 The triggers for rescue authority involvement are reliant on failures of the communication schedule (scheds/skeds) or to return as scheduled in a voyage plan.
- 6.1.13 The degradation in conditions over the 14 hours following the capsize included cloud cover, decreased visibility and increased wind and wave conditions creating challenges actioning the rescue effort. The rescue response was not triggered as early as may otherwise have been possible.
- 6.1.14 Several distress communications devices including beacons were either damaged or inaccessible, leading to delayed confirmation of their situation. The only recorded distress communication was from the co-skipper's phone call-enabled smartwatch (after the search has been commenced).
- 6.1.15 Noting the limited capacity of two-handed crews in an incident, a float-free EPIRB could be suitable, depending on the boat arrangement. Special consideration of float-free EPIRBs' functionality is needed to avoid accidental distress signal activation through hydrostatic release from the mounting/housing and water activation of the trigger.
- 6.1.16 Two-handed sailing presents extra challenges in rapidly accessing equipment in an emergency. No special requirements or recommendations for two-handed racing equipment were noted in the Special Regs [6]. This could benefit by further review by experienced two-handed sailors.

## 6.2 Actions Taken

- 6.2.1 Marine Rescue NSW has advised through Australian Sailing [20] that they have:
- Updated the Marine Rescue NSW App as published in Australian Sailing's NSW News the article *Log On and Off with Marine Rescue NSW* [21] attached at [Appendix F](#).
  - Updated the website to include scheds/skeds and clarification of AIS tracking functionality.
- 6.2.2 The Australian Maritime Safety Authority (AMSA) has:
- Supported the ORCV's *Inadvertent Distress Beacon Activations* report [18].
  - Recommended and received the manufacturer's investigation of the skipper's PLB.
- 6.2.3 The Water Police has:
- Conducted an initial debrief with the sailors.
  - Supported this review with input surrounding the rescue.

## 7. RECOMMENDATIONS

Based on the Conclusions outlined in the previous section it is recommended that:

- 7.1 Race organisers assess the risks of the inclusion of qualifiers in the Notice of Race. This should consider: the length (distance and time) of qualifier versus race; the equipment audit status; and the provision of communication and incident management support. This may include prescribing additional criteria in qualifiers or warning sailors of the added risks.
- 7.2 Sailors undertaking qualifying passages should:
  - a. Log a voyage plan with Marine Rescue NSW or an equivalent.
  - b. Arrange scheds/skeds with Marine Rescue NSW or a supporting contact.
  - c. Equip the boat to the comparable race category standard of equipment.
- 7.3 Support team members have a plan of action to notify appropriate search authorities if communication schedule not met or AIS stopped tracking.
- 7.4 Australian Sailing open the following Special Regs [6] content for review:
  - 7.4.1 Clause 4.19.3(c). Whether liferaft deployment when the boat is inverted (for movable ballast) should be expanded for variable ballast, and whether two-handed boats should be included.
  - 7.4.2 Clause 4.20. Whether a secondary grab bag location, accessible if a boat is inverted (such as near the transom), should be required to allow critical items to be including:
    - electronic communications (e.g. handheld VHF, EPIRB)
    - visual signalling (e.g. flares, laser light).
  - 7.4.3 Whether a float-free EPIRB should be recommended for use when two-handed racing.
- 7.5 Australian Sailing communicate with the sailing community regarding:
  - 7.5.1 The potential of loss of keel if experiencing unusual steering or boat behaviour through a Safety Information Notice or other method.
  - 7.5.2 An independent review of the Special Regs [6] for coverage of two-handed racing.
  - 7.5.3 The sailors' key contributors to survival, via education or awareness programmes:
    - experience in offshore sailing
    - fitness level
    - preparation and pre-voyage team agreements (roles and communication)
    - wearing of suitable offshore clothing
    - use of sea survival techniques as taught in accredited courses.
- 7.6 Australian and World Sailing ensure the Sea Safety Survival Course notes the disorientation experienced if escaping from a capsize, and related challenges in locating critical items.
- 7.7 World Sailing provide input to the relevant standards working groups (IEC and ETSI) regarding robustness of Personal Locator Beacons (PLBs) for use in the marine environment.
- 7.8 Sailors generally:
  - a. Carry each personal beacon (PLB and AIS PCOB) separately on their person.
  - b. For two-handers, carry personal beacons (PLB and AIS PCOB) at all times.
  - c. Test personal beacons (including moving parts/antennas) before sailing departure (potentially in a pre-departure briefing) in accordance with manufacturer's recommendations.
  - d. For distress communication devices, ensure that the manufacturer's signalling indication signs are understood before a voyage.
  - e. Continue to monitor developments in communication and electronics features (such as distress alert receipt confirmations), to inform choices in equipment.
  - f. For two-handers, consider having spare air available and being trained in its use.
  - g. When voyage planning, note that forecast weather and estimates of arrival will affect the rescue conditions (eg wind, sea state, visibility) and rescue asset deployment.

## List of Acronyms and Abbreviations

Term	Description	Ref [6]
AIS	Automatic Identification System	3.29
AIS PCOB	AIS personal crew overboard beacon	5.05
AMSA	Australian Maritime Safety Authority	
BOM	Bureau of Meteorology	
DSC	Digital Selective Calling	
ECDIS	Electronic Chart Display and Information System	
ETSI	European Telecommunications Standards Institute	
EPIRB	Emergency Position Indicating Radio Beacon	4.18
HQJOC	Headquarters Joint Operations Command (Australian Government, Defence)	
IEC	International Electrotechnical Commission	
ISO	International Organization for Standardization	
JRCC	AMSA Joint Rescue Coordination Centre	
kn	Knots	
LKP	Last Known Position	
MAC	NSW Marine Area Command	
nm	Nautical mile	
PLB	Personal Locator Beacon	5.05
RLTC	Rapid Launch Trauma Coordinator, Ambulance Service NSW	
TWA	True Wind Angle	

## Glossary

Term	Description	Source
Builder's Certificate	A Certificate specifying the information stated in Reg 15 of Shipping Registration Act	AMSA
Builder's Declaration	A declaration signed and dated by the builder to confirm the yacht is built in accordance with the reviewed plans	3.03.1(c)
Force 7	Beaufort Wind Scale 7: 28-33 kn average wind speed	<a href="#">BOM</a>
Moderate waves	WMO Sea State code 4: 1.25 – 2.5 m height, sea becoming furrowed	<a href="#">BOM</a>
Moderate winds	Beaufort Wind Scale 4: 11-16 kn average wind speed	<a href="#">BOM</a>
Owner's Manual		AS SR 3.02.4, Appendix C
Stowage Chart	A boat plan clearly marked with the location of the principal items of safety equipment	AS SR 3.02.4, Appendix C

## References

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- [3] Australian Sailing, "International Rating Certificate (IRC) Certificate, 47946 SHORT HANDED," 9 June 2022.
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- [7] Australian Maritime Safety Authority, "FOI request - Nexba Incident - ID 2022/4398," 15 December 2022.
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- [10] AMSA, "Spatial@AMSA, Vessel Tracking Data," July 2022. [Online]. Available: <https://www.operations.amsa.gov.au/Spatial/DataServices/DigitalData>. [Accessed 28 September 2022].
- [11] Nexba Skipper, Interviewee, [Interview]. 8 September 2022.
- [12] Nexba Co-Skipper, Interviewee, [Interview]. 19 September 2022.
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- [14] Nexba Owner, Interviewee, [Interview]. 10 October 2022.
- [15] Transport for NSW, "Safety Equipment Checklist," [Online]. Available: <https://www.nsw.gov.au/driving-boating-and-transport/waterways-safety-and-rules/lifejackets-and-safety-equipment/equipment-checklist#toc-related-information>. [Accessed 30 September 2022].
- [16] World Sailing, "2020-2021 Offshore Special Regulations: Governing Offshore Racing for Monohulls & Multihulls," [Online].
- [17] Water Police, "Nexba Independent Review," *Email response*, 28 October 2022.
- [18] Ocean Racing Club of Victoria (ORCV), "Inadvertent Distress Beacon Activations," September 2022. [Online]. Available: <https://cdn.revolutionise.com.au/site/nfs4ywlou4kvyvbp.pdf>.
- [19] ACR Electronics, "Personal Locator Beacon Guide: Do's and Don'ts," [Online]. Available: <https://www.acrartex.com/wp-content/uploads/2021/09/PLB-Tips-Guide.pdf>.
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## Appendices



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## Appendix A. Terms of Reference

### The Royal Prince Alfred Yacht Club – Independent Incident Review of the Nexba Capsize

Independent incident review and reporting of Nexba capsizing, 2<sup>nd</sup> July 2022, and subsequent rescue of the crew constituted by The Royal Prince Alfred Yacht Club.

#### Preamble

On Friday 1<sup>st</sup> July skipper [REDACTED] and [REDACTED] departed the Royal Prince Alfred Yacht Club marina to complete a 100 nautical mile passage as qualification for the Sydney to Southport offshore race in the vessel Nexba. At approximately 1am, 2<sup>nd</sup> July, the vessel capsized 5 nautical miles off the coast of Wollongong. The crew were subsequently rescued on Saturday afternoon 2<sup>nd</sup> July approximately 15 hours after the capsizing of the vessel.

#### Charter

It is understood Nexba capsized following the non-traumatic separation of the keel from the vessel. The review need not overlap insurance investigations taking place however may include these documents as addendums in its report.

The review is to understand the timeline of events leading up to the qualifying passage, during the passage through to capsizing and following capsizing through to rescue. If thought fit, provide recommendations within the report to improve safety for offshore sailors.

#### Powers & restrictions;

The Review may do all things necessary and convenient to comply with the Terms of Reference.

The Review has no power to require people to attend its sittings or answer the panel's questions and therefore will function on a voluntary basis.

People are invited to attend. If attending, they can determine what if anything they may wish to say. Written submissions are also encouraged and can be sent to [REDACTED]@rpayc.com.au

Subject to applicable law, confidential submissions may be made to the Review.

The purpose of the Review and subsequent report is for the prevention of incidents and casualties, and not to attribute blame or determine liability.

The review's report will follow World Sailing's guidelines for incident reporting and will be structured as follows;

- a) Introduction
- b) Deducted facts
- c) Analysis
- d) Recommendations
- e) Include administrative components such as a Table of Contents, List of Acronyms & appendices

Before finalising its report, the Review will give interested persons the opportunity to comment on any matter they may regard as adverse.

It is anticipated the review and any findings will be finalised by December 2022 with the report being made public.

#### Review working party;

Anne Simpson  
Chris Links  
Jan Scholten

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## Terms of Reference

- 1) Crew preparation and training for voyage
  - Inclusive of previous offshore & two-handed experience
- 2) Details of safety equipment carried inclusive of stowage & accessibility
  - Status of vessels attainment of offshore special regulations category 2
- 3) Operations & functionality of safety equipment at the time of and following the capsize
- 4) Timeline of events leading up to the qualifying passage, during the passage through to capsize and following capsize through to rescue
- 5) Review safety protocols for offshore qualifying passages

On completion of the review the WP to provide a report noting analysis, deducted facts and if thought fit recommendations relating, but not limited, to;

- Storage of safety equipment, related to catastrophic failures of the vessel
- Ability to check functionality of PLB
- Possible variations to safety procedures needed for shorthanded sailing
- Tell-tail signs of potential keel failure – to be added to existing knowledge

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## Appendix B. Members of the Working Party

The RPAYC appointed the following members to the Working Party:

- Chris Links (Chair)
- Jan Scholten
- Anne Simpson

### Biographies

#### Chris Links

A marine shipwright and professional sailor, Chris grew up through the dinghy ranks and started offshore sailing as a 14 year old. He has been a member of the Australian sailing team in the Soling Class and competed successfully in the Etchells, J24 and Melges 24 Classes.

Chris has competed in all the offshore events on the east coast of Australia, the Fastnet, Middle Sea and Maxi World Championships, in boats ranging from 30 ft to *Wild Oats XI*, 100 ft Maxi, currently. He was part of the 2006 crew that currently hold the record on *Geronimo* for the Transpacific West to East (Yokohama to San Francisco). In the 2007 Middle Sea race, Chris sailed on *Loki*, whose crew were airlifted to safety after rudder damage to the vessel. After this experience and with many years in sailing, Chris understands the importance of good preparation and supports a strong safety culture in the sport. He is a member of RPAYC.

#### Jan Scholten

Involved with the Australian sail making and rigging industry for 30 years, Jan has international exposure to the marine (sailing) industry, including regular liaison with sailmakers, riggers, shipwrights, yacht brokers and naval architects. As the Australian Distributor for the Contender Sailcloth and Selden Masts' product ranges, he is in constant communication with local and overseas suppliers.

Successful Australian East coast yacht races and deliveries span over 40 years and stretch from Port Philip Bay to the Great Barrier Reef.

His recent commitments have focused on two-handed sailing with Jules Hall on his J99 *Disco Trooper*, including winning the 2021 Sydney to Hobart two-handed division. This has included the CYCA 2021 / 2022 Blue Water Series, Short Offshore Series and most recently the Pittwater Coffs Harbour race.

Having competed in 19 Rolex Sydney to Hobart races gives him a good insight into the *Nexba* team's race preparation and understanding of their ordeal.

#### Anne Simpson

A former Safety Engineering and Assurance Specialist with naval ships and presently Senior Engineer in ship certification. She is a member of Australian Sailing's National Safety Committee. She has been a keen amateur sailor, completing several offshore ocean races (including Sydney to Gold Coast/Hobart) and is a member of RPAYC.

### Involvement

All Working Party members contributed on a voluntary basis as members of the RPAYC, on an unpaid basis.

No members of the Working Party were involved with the boat, its equipment or the incident being considered for review. Any perceived conflict of interest in their relationships with the persons involved in the incident was declared and managed appropriately.

All members of the Working Party agreed to the conclusions and recommendations of this report.

### Submissions

A draft of this report was provided to the sailors, owner and the Board of the RPAYC. Feedback obtained was considered and where appropriate, the report updated to suit.

## Appendix C. Equipment

### 'Nexba' FarrX2

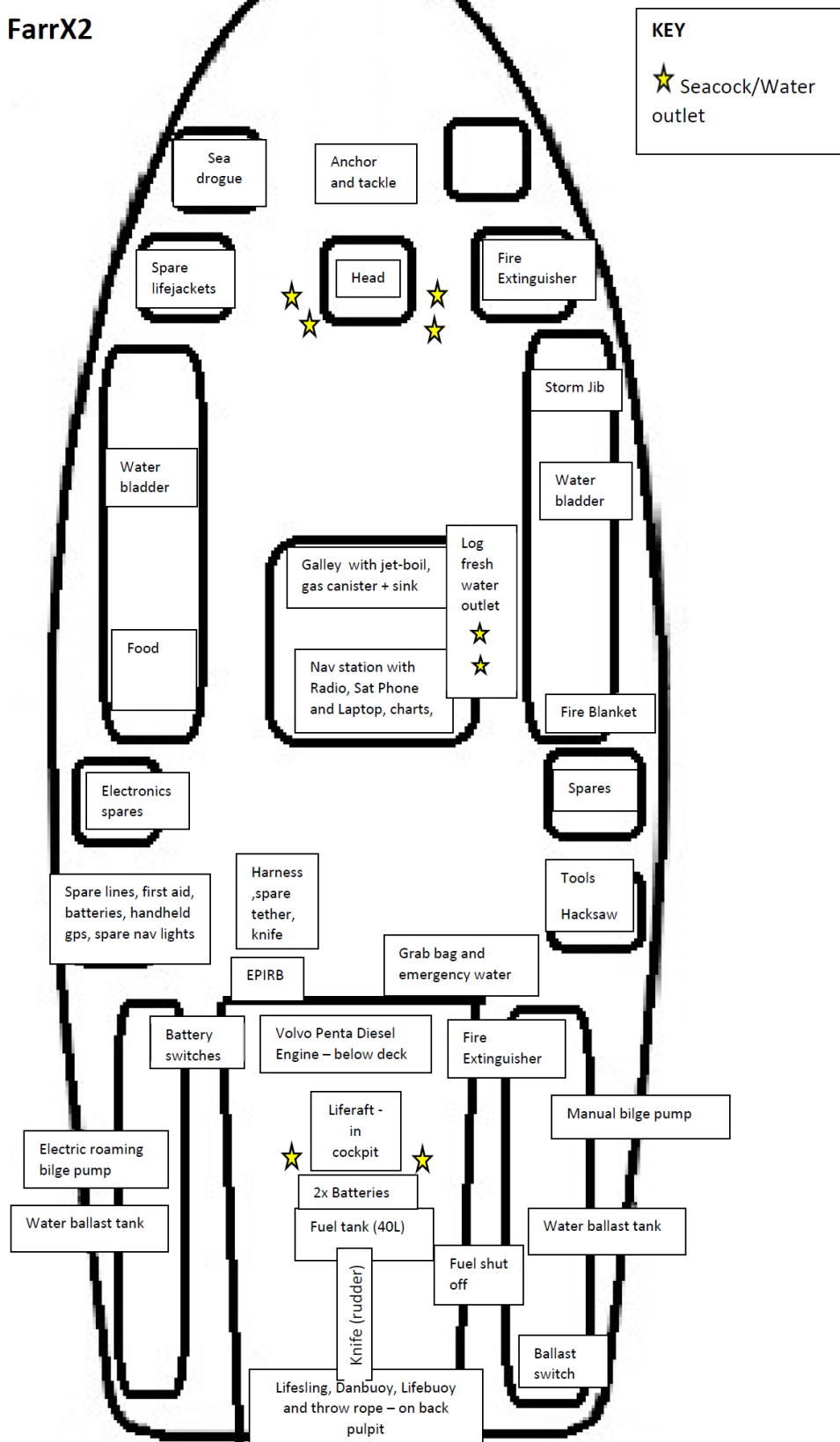
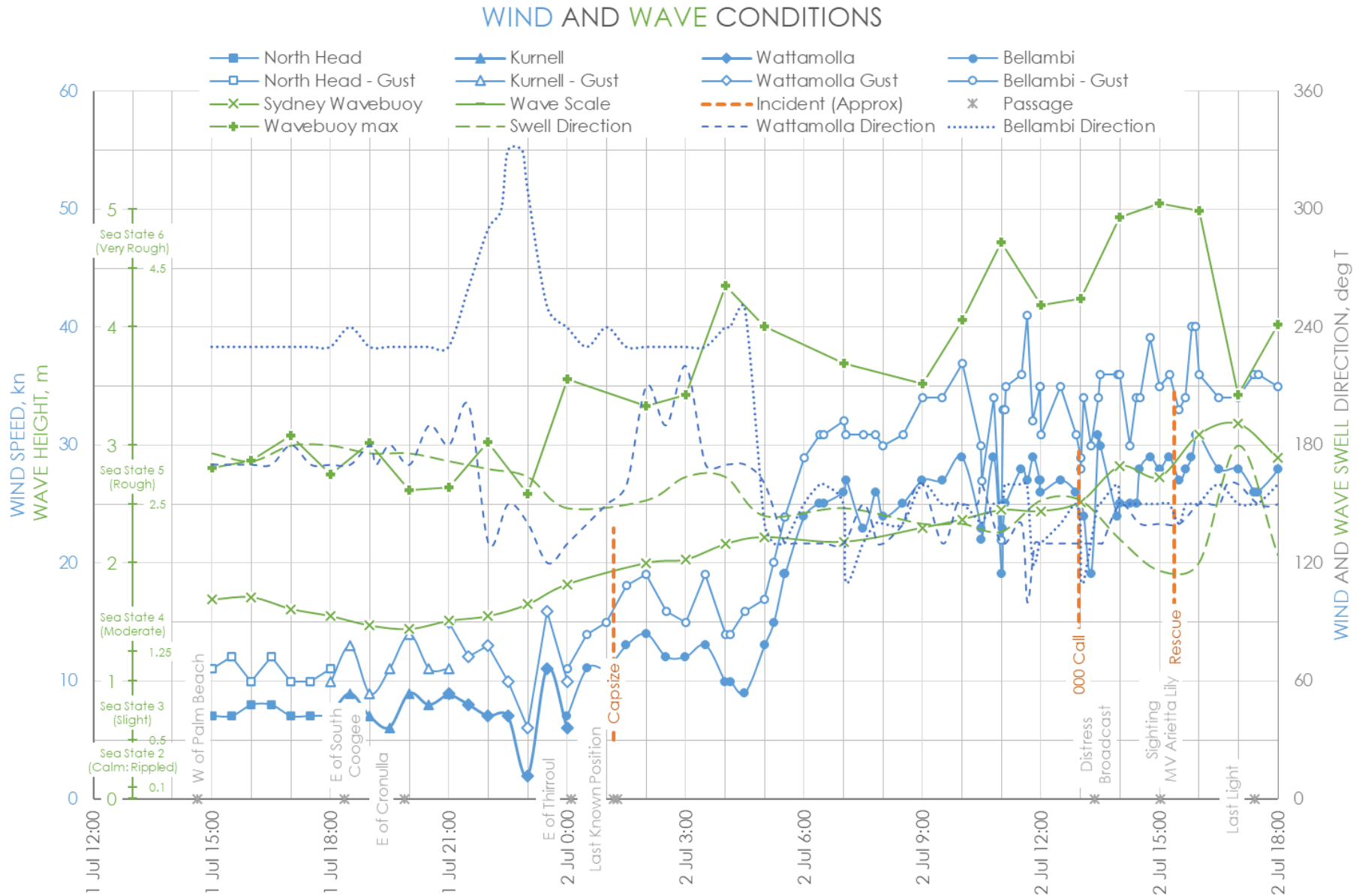


Figure 5 - Nexba Stowage Chart [Source: Sailors]

## Appendix D. Environmental Conditions

This summary of conditions and key events (referenced from sections 2.3 and 2.4) is compiled from Bureau of Meteorology [8] and Manly Hydraulics Laboratory [9] records.

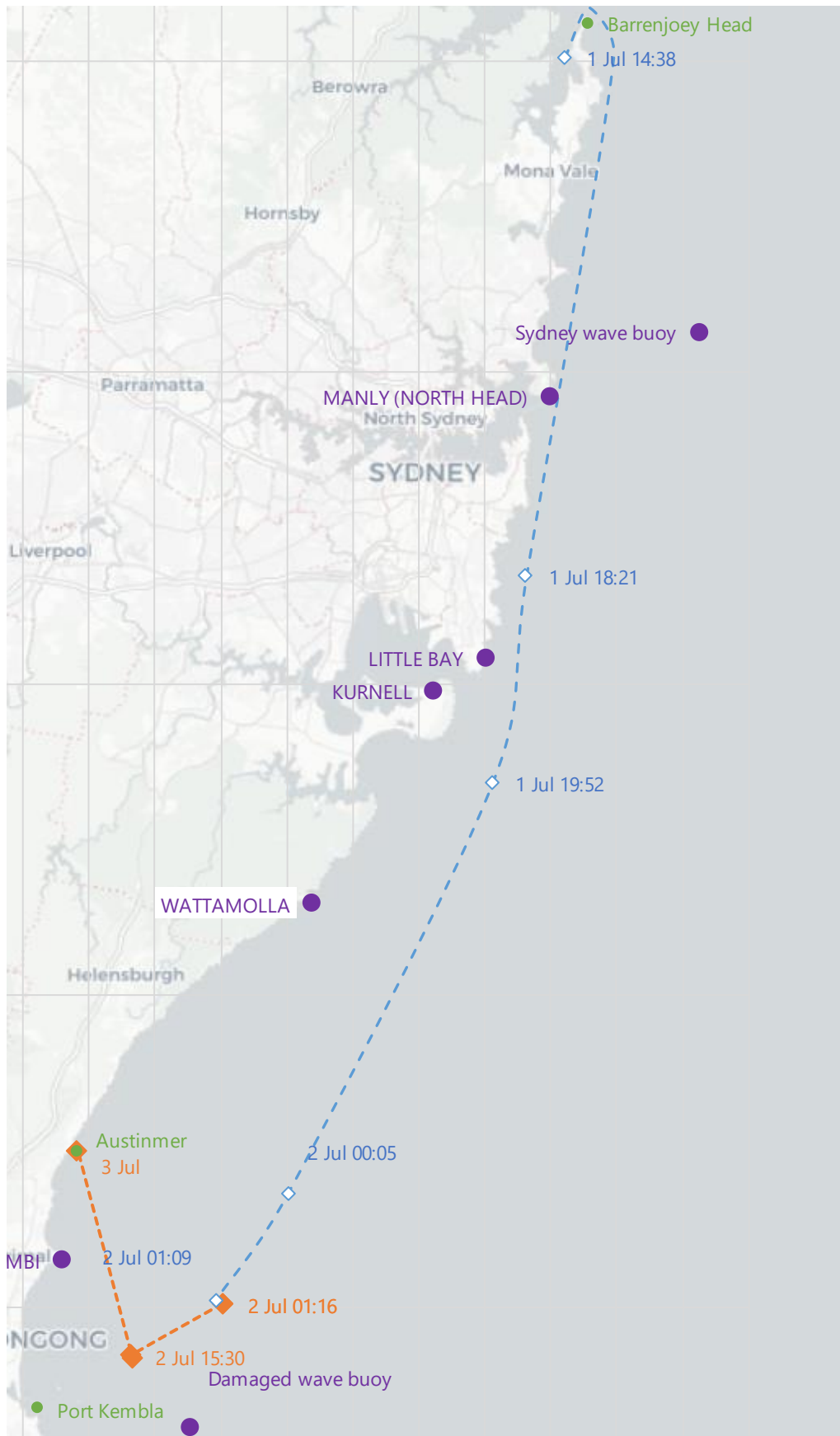




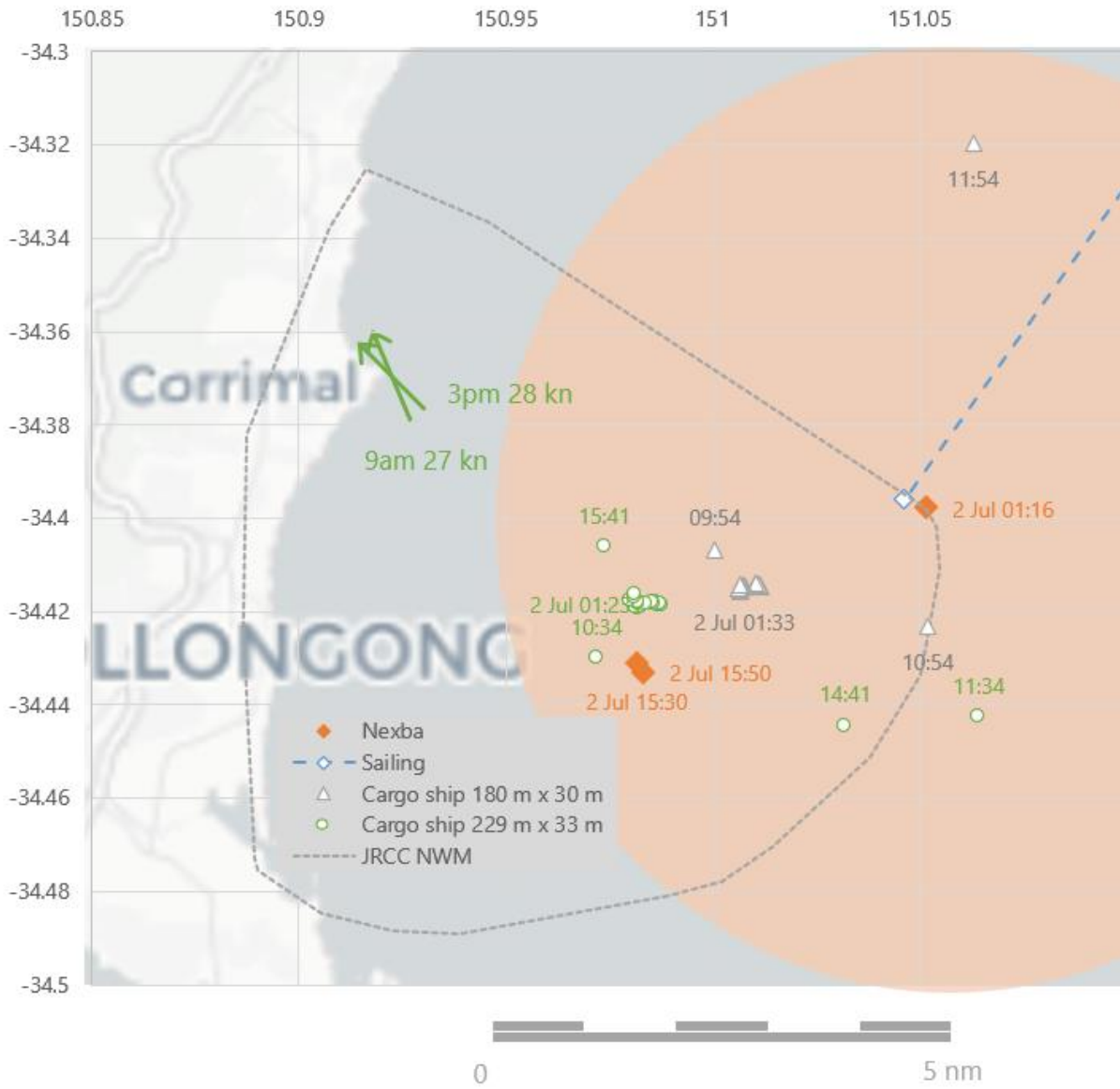
## Appendix E. Key Course Locations

### Key Voyage AIS Locations

A summary of key location records is compiled from AMSA's AIS vessel tracking records [10] as described in section 2.4. Dashed lines provided for continuity, but do not represent complete track.

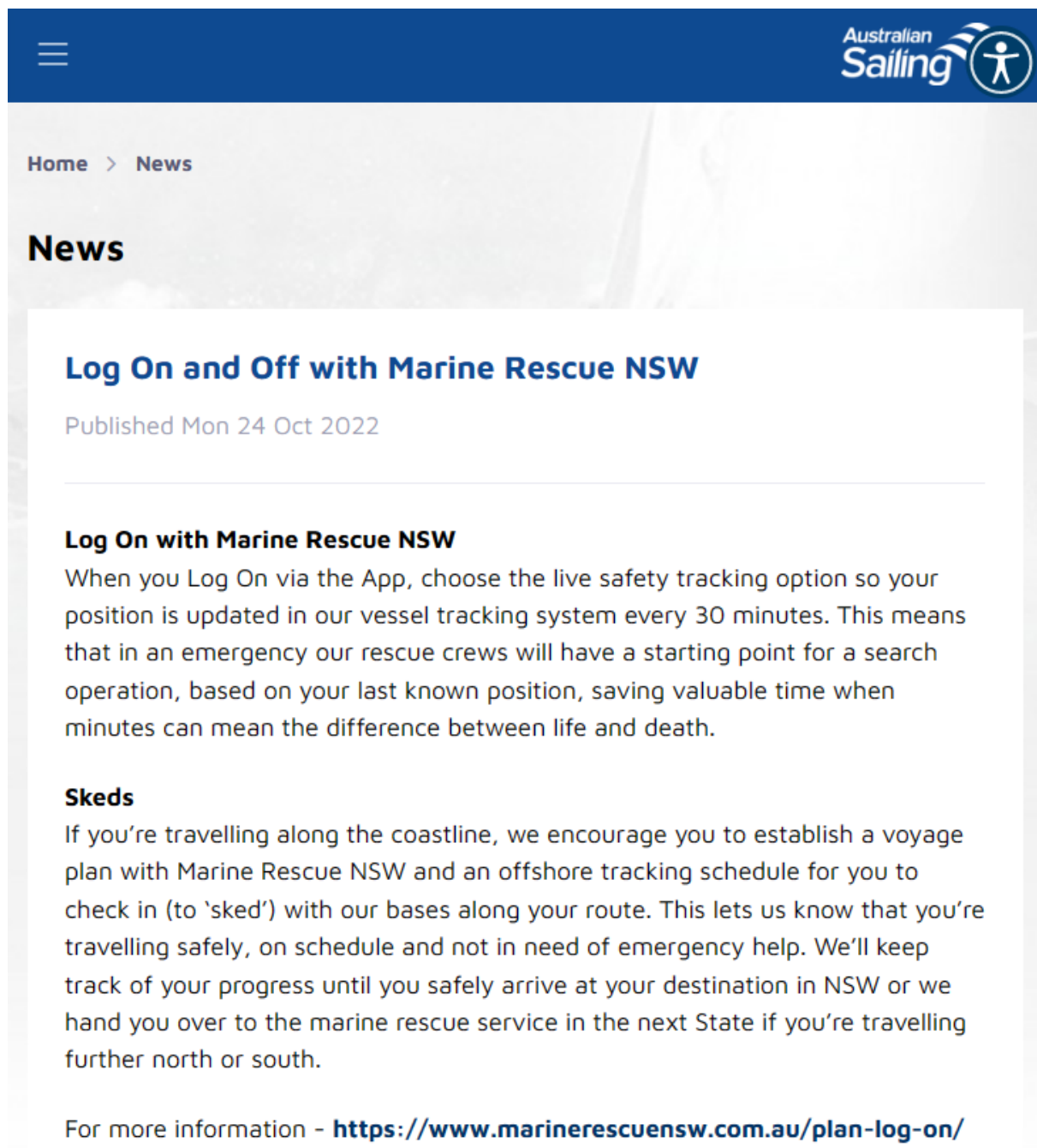


## Detailed AIS Locations in Vicinity of Capsize (2 July 2022)



## Appendix F. Australian Sailing (NSW) News Article

<https://www.sailing.org.au/news/log-on-and-off-with-marine-rescue-nsw/>



The screenshot shows the Australian Sailing website's news page. At the top, there is a blue header with a hamburger menu icon on the left and the 'Australian Sailing' logo on the right. Below the header, a breadcrumb trail reads 'Home > News'. The main heading is 'News'. The featured article is titled 'Log On and Off with Marine Rescue NSW' and is dated 'Published Mon 24 Oct 2022'. The article content includes a sub-heading 'Log On with Marine Rescue NSW' and a paragraph explaining the live safety tracking option in the app. It also includes a sub-heading 'Skeds' and a paragraph explaining the importance of voyage planning and check-ins. At the end of the article, there is a link for more information: <https://www.marinerescuensw.com.au/plan-log-on/>.

Home > News

### News

#### Log On and Off with Marine Rescue NSW

Published Mon 24 Oct 2022

##### Log On with Marine Rescue NSW

When you Log On via the App, choose the live safety tracking option so your position is updated in our vessel tracking system every 30 minutes. This means that in an emergency our rescue crews will have a starting point for a search operation, based on your last known position, saving valuable time when minutes can mean the difference between life and death.

##### Skeds

If you're travelling along the coastline, we encourage you to establish a voyage plan with Marine Rescue NSW and an offshore tracking schedule for you to check in (to 'sked') with our bases along your route. This lets us know that you're travelling safely, on schedule and not in need of emergency help. We'll keep track of your progress until you safely arrive at your destination in NSW or we hand you over to the marine rescue service in the next State if you're travelling further north or south.

For more information - <https://www.marinerescuensw.com.au/plan-log-on/>