

ORCV Internal Inquiry

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This Report provides the results of an Inquiry commissioned by the ORCV into the 2012 Melbourne to Port Fairy Yacht Race. During the race storm force winds caused damage to yachts, injuries to several crewmembers and the loss of the yacht Inception.

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LIST OF ACRONYMS

AIS	Automatic Identification system
AMSA	Australian Maritime Safety Authority
BOM	Bureau of Meteorology
DSC	Digital Selective Calling radio system
EPIRB	Emergency Position Indicating Radio Beacon
GPS	Global Positioning system
HF	High Frequency radio transmissions –beyond line of sight
IMT	Incident Management Team
MOU	Memorandum of Understanding
NOK	Next of Kin
ORCV	Ocean Racing Club of Victoria
PFD	Personal Flotation Device
PLB	Personal Locator Beacon
RCC	Rescue Co-ordination centre –Canberra
SAR	Search and Rescue
SART	Search and Rescue Transponder
SSSC	Sea Survival and Safety Course
Vic Pol	Victoria Police
VHF	Very High Frequency radio transmission-line of sight
VMR	Volunteer Marine Rescue
YA	Yachting Australia

1 INTRODUCTION

1.1 Purpose and Terms of Reference

1.1.1 The purpose of the Inquiry was to assist the ORCV in improving its policies, practices, procedures and training. The Inquiry did not make findings of fact or determinations. Attendance and responses to questions was voluntary. This report has been prepared by the Inquiry Panel solely for publication to the Committee members of the ORCV and the Inquiry Panel takes no responsibility for its publication in whole or part to anyone else.

1.1.2 The full terms of reference are attached at Annex A.

1.2 Inquiry Members

1.2.1 The Inquiry Panel brought a range of skills to their task; all are experienced offshore yachtsmen. Short CVs for the Inquiry members are attached at Annex B.

1.3 Acknowledgements

1.3.1 The Inquiry Panel wishes to acknowledge the assistance of the Skippers and crew members of the competing yachts who contributed to the Inquiry Panel's understanding of the incident. For the members of Inception's crew this entailed revisiting a traumatic experience, we are particularly indebted to them and wish to recognize their fortitude and resolve.

1.3.2 The ORCV, AMSA and Victorian Police officials involved have greatly assisted our understanding, freely providing their insights into events.

1.3.3 Details of those interviewed are at Annex C.

1.3.4 The naval architects Professor Peter Joubert AM and Michael Rikard-Bell have assisted in our understanding of the naval architecture aspects of the inquiry and the possible forces acting on the life raft. Ray Shaw has also contributed significantly to the resolution of the forces acting on the life raft. Dr Lou Irving, Director Respiratory and Sleep Medicine and Director Clinical Training, Royal Melbourne Hospital, Associate Professor Department of Medicine and Physiology, Melbourne University has assisted us in understanding the implications of secondary drowning arising from the Inception incident.

1.3.5 Sally Williams has been a tireless supporter, facilitator and provided the secretarial and production effort to compile this Report.

2 EXECUTIVE SUMMARY

- 2.1 On Friday, 6 April 2012 whilst competing in the Ocean Racing Club of Victoria's Melbourne to Port Fairy Yacht Race, a category 2 race under the Yachting Australia grading system, the fleet was hit by a severe weather front shortly before sunset with storm force winds of 55-60 knots, very large seas averaging 6.1m and peaking at 10.7m. Conditions were significantly worse than the gale force winds of 40 Knots and seas of 6m that had been forecast. Of the 12 boats in the fleet, 10 retired, 1 completed the race and 1 yacht sank. There were a number of injuries to crewmembers reported and damage to yachts, including 1 dismasting.
- 2.2 The Beneteau 50 yacht, Inception, with a crew of 6 sank shortly before midnight. It appears that Inception took on water forward resulting in a bow down trim. It is believed that this initial flooding forward may have led to an escalating sequence of events, allowing more water to enter the yacht and overwhelm efforts to clear it. In the final phase of this sequence the flooding was very rapid, causing the boat to sink in approximately 20-25 minutes after water was noted flowing into the main cabin from forward.
- 2.3 Having lost their life raft overboard sometime earlier in the storm, Inception's crew was left with no option but to inflate their Personal Flotation Devices (PFDs) and step into the sea as the boat sank. Fortunately they were able to alert friends at the Port Fairy Yacht Club of their plight by mobile phone calls. Those at the Port Fairy Yacht Club in turn alerted the ORCV Race Director and local search and rescue authorities, the Port Fairy Maritime Rescue Services, who in turn alerted the Victorian Water Police. Prior to abandoning the boat the crew activated Inception's emergency beacon (EPIRB) and two Personal Locator Beacons (PLB) carried by crewmembers. The GPS positions from the latter were critical in locating and rescuing the crew from the water. The crew also assisted efforts to locate them by firing a distress flare.
- 2.4 The Rescue Coordination Centre in Canberra was alerted to the situation by the receipt of information from the distress beacons and quickly coordinated aviation and shipping responses, whilst coordinating with the Victorian Water Police. A rescue helicopter and specialized Search and Rescue (SAR) fixed wing aircraft were quickly dispatched to the scene. The ORCV Race Director and shore radio operator coordinated an immediate response at the scene, alerting the nearby yacht Trybooking.com, a competitor in the race and assisting her with positional and navigational information. After several attempts, Trybooking.com located the crew and conducted a successful rescue under very difficult conditions, demonstrating great resolve, courage and resourcefulness.

- 2.5 By and large the prior arrangements in the RCC, Victorian Police and ORCV to manage this type of incident worked satisfactorily. However, the extreme weather and sea conditions imposed limits on their ability to marshal search and rescue resources at the scene. The proximity to a hazardous lee shore imposed a tight time scale if rescuers were to succeed. It is fair to say that the ORCV's coordination at the scene was critical to the successful rescue against this tight time scale; there were a number of lucky breaks, of which those involved took full advantage. The incident has provided a number of valuable lessons in the management of yachts under such conditions. With the benefit of hindsight we have suggested a number of improvements to procedures and practices. These are set out in the Analysis and Recommendation section and Annexes of this report.

3 BACKGROUND

3.1 Race Organization

The race was organized and conducted in accordance with the Yachting Australia Special Instructions. The Chairman of the ORCV's Race Committee oversaw the preparations, which were validated by the appropriate ORCV officials.

3.2 Yachts Involved

A list of the yacht's involved and their disposition at the end of the race is at Annexure D.

4 CHRONOLOGY OF EVENTS

- 4.1 The 2012 Melbourne to Port Fairy yacht race began at midnight on Thursday, 5 April. Twelve yachts started and enjoyed fair winds for the passage to Cape Otway, which they rounded during the late morning/early afternoon of Friday, 6 April.

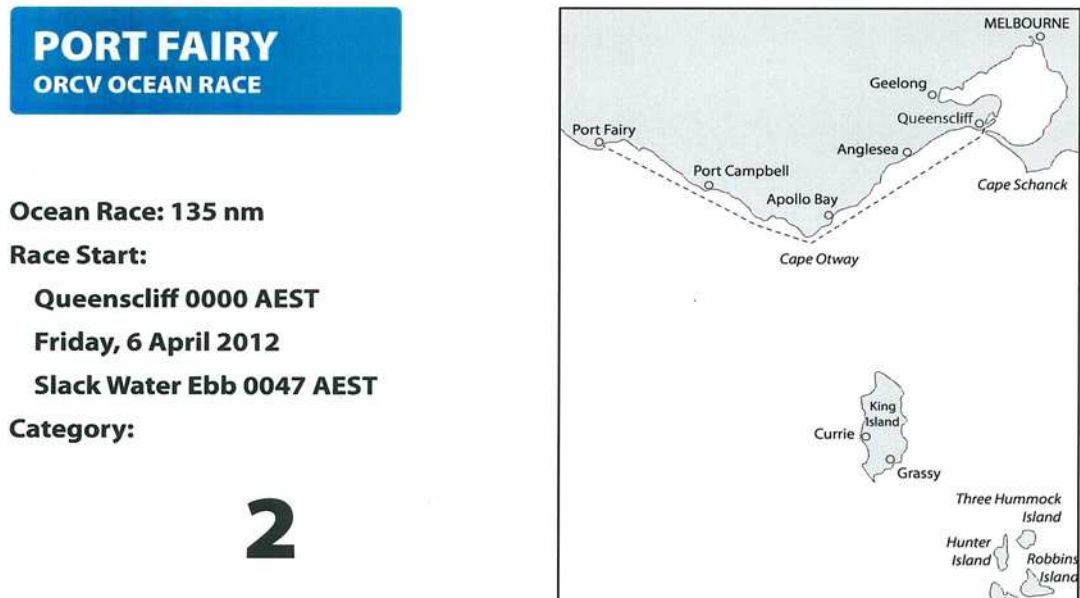


Figure 1 – Layout of The Melbourne to Port Fairy Yacht Race Course

- 4.2 The yacht Inception was a Beneteau 50 and said to be a 'heavy boat' at 16 tons. The particular model had a small cabin in the bow, termed a 'Skippers Cabin', with a bunk and head, accessed via a hatch on the foredeck; a non-watertight bulkhead isolated it from the remainder of the boat. The crew of 6 included 3 experienced offshore yachtsmen and 3 who had completed at least one offshore race in the boat.

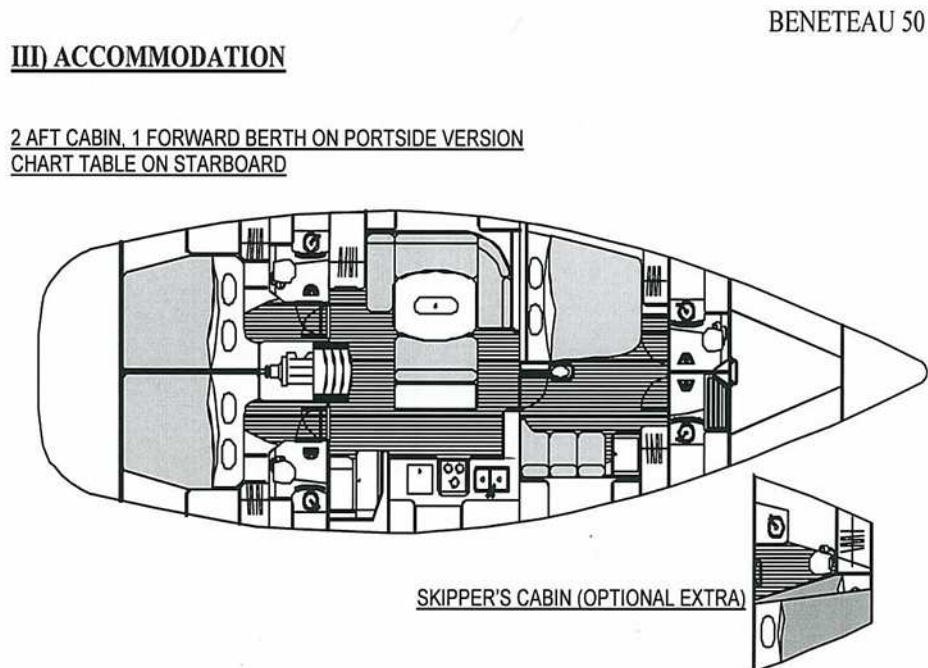


Figure 2 – Internal layout of Inception

- 4.3 After the fleet rounded Cape Otway, winds strengthened to the forecast gale force from the West as the front approached, providing a headwind for the yachts making their way along the rugged, 'shipwreck coast' en route to Port Fairy. The change reached Inception at approximately 1530 and they changed from a number 1 to number 3 jib with one reef in the mainsail. As the wind built the 2nd and then 3rd reefs were taken in and the jib furled to reduce its area. The wind dropped momentarily at about 1730 and they shook out the reefs and prepared to hoist the number 1 jib before the wind quickly built again to storm force at 1830 and they dropped the mainsail and secured it to the boom. Under much reduced sail the boat appeared to handle the conditions well and they started the engine to assist them as they tacked back and forth, waiting for the change to move through and the wind to go around to the South West, giving them a better lead to Port Fairy. At this point the fatigue level in the skipper and crew was high, limiting the number of people available to sail the boat and probably impacting on decision-making.
- 4.4 At the height of the storm, at approximately 2100, the life raft went overboard when a large sea washed over the boat as it tacked and carried away the life raft from its stowage on top of the coach house. The raft flew between the helmsman and a crewmember in the cockpit, passed over the after guard rails and disappeared into the night. The life raft's painter was not secured to the boat.
- 4.5 At about 2230 the wind dropped to 28 - 32 knots and the number 3 jib was unfurled slightly, the boat began to make 6-7 knots of headway. The skipper on the helm was tired and was relieved at approximately 2300, he then rested on the cockpit seats. At about 2325 he noticed water collecting at the forward end of the cockpit, the helmsman also noted that the boat was down by the bow.
- 4.6 The helmsman made a mobile phone call to a friend at the Port Fairy Yacht Club, alerting him to the problem. The Yacht Club in turn alerted the Race Director, who was nearby in the ORCV's mobile race van, manning the finishing line. The Race Director then rang the ORCV's shore radio operator in Melbourne alerting him to a possible problem with Inception. The radio operator recalls the time of this call as approximately 2335.
- 4.7 The skipper went below to check the bilges; the automatic bilge pump was running occasionally as the boat came upright and water collected in the sump, he sighted the bilges and there did not appear to be an unusual amount of water in them. He went back up to the cockpit but remained concerned by the pooling of water at the forward end of the cockpit – an unusual situation. Troubled by this he went below again to investigate. At the same time the helmsman reported that the boat was unresponsive; he could not bear away.

- 4.8 As the skipper came below he noticed water coming from forward, flowing over the doorsill from the forward cabin – there was a lot of water in the boat. The HF radio was on, he initiated a PAN call on HF and recalls the time as 2335. At the same time he woke the 3 crewmembers sleeping below with the chilling call ‘get up we’re sinking’. One of the crewmen reported that when he stood up in the aft cabin he was standing in calf deep water. Attempts were made to operate the hand bilge pumps and bail the water out of the boat with a bucket, but these were ineffective against the inflowing water. When the skipper endeavoured to send a Mayday call he noticed that the water was already over the navigation table seat. Mayday calls were made on HF and VHF. None of the PAN or MAYDAY calls appears to have been heard. The engine was stopped as it was spraying water about and shortly afterwards the boat lost all power.
- 4.9 In the cockpit the jib was fully furled and the boat lay a’hull. At the request of the Race Director, the friend at the Port Fairy Yacht Club rang the helmsman to obtain Inception’s current position. The helmsman advised that the boat was down by the bow, taking on water, the life raft had been lost overboard, the boat had lost power and could not provide a current position; the 6 people on board were taking to the water and had activated the EPIRB. This information was relayed to the Port Fairy Marine Rescue, Victorian Water Police and the Race Director. The Race Director again rang the ORCV radio operator who logged the advice of the second call from the Race Director at 2350.
- 4.10 On Inception the crew attempted to fire a parachute flare; the flares were different to those they had trained on and they had difficulty making out the instructions in the darkened cockpit. The first two attempts failed, the flares went into the sea; the third flare was launched successfully.
- 4.11 The crew members in the cockpit activated the boat’s EPIRB and two of their GPS capable PLBs. The satellite received signals from these at 0003 and consistent position fixes from both the PLBs were relayed to AMSA at 0006.
- 4.12 Five of the crew inflated their Personal Flotation Devices (PFD), clipped together using their safety harness tethers and entered the water. The last two stepped off as the boat sank beneath them shortly before midnight. The time of sinking is confirmed by the fact that Inception’s tracker did not update at midnight! One crew member had not inflated his PFD or clipped on and this was sorted out with some difficulties in the water. They endeavoured to form a ‘survival huddle’ as taught on Yachting Australia’s Safety and Sea Survival Course (SSSC) but this proved too difficult in the sea conditions as they were thrown against each other by the waves. Instead, they clipped together in a line, whilst endeavouring to keep their backs to the sea and hold the boat’s EPIRB and the 4 PLBs that had been activated above the water.

- 4.13 Several of the PFD crotch straps were not tight enough, causing difficulties for the wearers. None of the PFDs had spray hoods and the survivors swam as necessary to keep their back to the wind. The helmsman's foul weather jacket's hood was caught under his PFD. His lifejacket appeared unable to support his weight but this could have been a result of a loose crotch strap. This meant he had to tread water to try and keep his face clear of the water. This accelerated his loss of body heat and was very tiring. Since he'd been at the helm prior to the incident he was already cold. As time passed the combined effects began to weaken him.
- 4.14 The nearest boat was believed to be Trybooking.com. They were alerted to the situation by HF radio call from the ORCV radio operator at 2352. At 2358 Trybooking.com reported seeing a flare, they missed getting an accurate bearing and turned towards the sighting. At 0026 the ORCV radio operator advised Trybooking.com of the PLBs position obtained by AMSA at 0006 and relayed by the Race Director. This position was confirmed by AMSA at 0016. The ORCV radio operator had navigational software on his PC and was able to plot Trybooking.com and the PLB positions and advise Trybooking.com of a course to steer in order to close the position.
- 4.15 Trybooking.com entered the PLB position into the yacht's electronic chart plotter and steered for the point. On arrival there were no survivors seen. They turned downwind and were distracted by the lights of Port Campbell that they mistakenly identified as the survivors. An updated position, received from one of the PLBs activated in the water was detected at 0028 and relayed by AMSA at 0045. This position was also entered into Trybooking.com's chart plotter. The boat used the two positions to estimate the direction and rate of drift between the 2 positions, aimed off to allow for this and shaped course for a new position. They planned an expanding grid search around this position, but as they approached the projected drift line they sighted a lone light on the crest of a wave. As they headed towards it a line of lights was sighted above them on the crest of an approaching wave – Inception's crew had been found.

- 4.16 With a crew of 4, only 1 of whom had extensive offshore sailing experience, and given the high sea state (averaging 6.1m, maximum 10.7m), Trybooking.com could well have hesitated to attempt the rescue. Instead they tackled the task with determination and resourcefulness, developing a technique to approach to windward, stop the boat beam onto the sea and let it drift down onto the survivors, adjusting position so that the survivors arrived at the transom step where they could be assisted into the boat. In a series of such manoeuvres the 6 survivors were hauled to safety. By 0215 the last man, the Skipper of Inception had been recovered. This was none too soon, particularly for one crewman who was exhausted from the effort to stay afloat and in danger of succumbing. Once below all revived, initial plans to transfer the casualty to Far Fosna, an offshore support vessel with medical facilities was abandoned as it was too dangerous. Trybooking.com headed initially for Warrnambool, but once advised of the treacherous conditions at the entrance, diverted to Port Fairy where they arrived just prior to 1000.
- 4.17 At 0056 the Race Director alerted one of the ORCV's Incident Management Team (IMT) and requested that he contact Inception's Next Of Kin (NOK). There were a number of errors in the crew's NOK phone numbers provided to ORCV and the lateness of the hour meant that several people could not be contacted immediately, nevertheless efforts continued throughout the night until all had been advised of the successful rescue. The 3 Port Fairy crew members' NOK lived nearby to each other in Port Fairy and were alerted to the situation by the Port Fairy Yacht Club members who had received the mobile phone calls from Inception shortly before midnight. Incorrect phone numbers and incomplete NOK details delayed the IMT contacting these people. In the event they were better informed and more current than the IMT member! One of these NOK contacted the RCC directly for advice on the search situation and this was provided. At 0222 the Race Director advised the IMT member that Trybooking.com had safely rescued all 6 of Inception's crew. When the IMT member rang the Port Fairy NOK they were already aware of this happy outcome.
- 4.18 On receipt of the emergency beacon information in the Rescue Coordination Centre (RCC) in Canberra at 0006, the wearers of the PLBs were identified by AMSA from the data provided by ORCV and the registration information provided with the PLBs. The position relayed from one of the PLBs was approximately 7 nm south of Port Campbell. The RCC contacted the Victorian Water Police who advised that they were aware of the incident and had communications (with other yachts via the ORCV radio operator) and updated the RCC with the information relayed by the second phone call to the Port Fairy Yacht Club.

4.19 The RCC reacted by:

- Tasking a Dornier 328 aircraft based at Essendon, specifically configured for searching, coordinating a rescue and dropping survival equipment such as pumps and life rafts.
 - At night there are limitations imposed by Aviation Regulations which require the aircraft to not operate below the Lowest Safe Altitude (LSALT) for the area (2500feet) in this case. As such the aircraft is not able to conduct a precision drop of equipment at night.
- Tasking a SAR helicopter, 'HEMS 4', based at Warrnambool.
 - This aircraft was fitted with search equipment, including night vision goggles but was unable to winch at night due to the lack of an auto hover capability or a crew certified to conduct such operations.
- Issuing a distress broadcast to shipping at 0035 requesting advice from ships within 4 hours steaming. Two ships responded:
 - The MV Stolt Rindo, a product tanker 7 nm South was hove to due to the weather and unable to respond.
 - An offshore supply vessel, the MV Far Fosna was 12 nm South and able to respond, ETA 0245.

4.20 The helicopter HEMS 4 arrived halfway through Trybooking.com's rescue and the Dornier arrived at the scene shortly after the rescue. The helicopter assisted by dropping 2 flares to illuminate the area and the Dornier whilst enroute assisted with coordination and acted as a radio relay.

4.21 The RCC continued to liaise with the ORCV Race Director and Radio Operator, relaying an updated position report from a PLB activated after entering the water. This beacon was delayed in obtaining a fix due to environmental conditions in the water. (See paragraph 7.2.8 below for a discussion on this) In the event the later position provided an indication of the drift line, greatly assisting the search by Trybooking.com. In the meantime the RCC began preparing for a second phase response by calculating the likely drift and search areas for a search at first light at 0621. The RCC was conscious of the proximity to the hazardous lee shore and calculated that they only had until 0800-0900 to complete the rescue; six additional helicopters were potentially available for this effort.

4.22 At 0204 advice was received in the RCC that Trybooking.com had recovered the 6 survivors; 5 were OK, 1 required hospital transfer. Options to transfer this patient to the helicopter at first light or the offshore supply vessel Far Fosna were considered too dangerous given the weather and sea conditions and the RCC were relieved to learn that the patient's condition was improving.

- 4.23 The Victorian Water Police (Vicpol) headquarters in Williamstown were alerted at 2359 by a call from the Volunteer Marine Rescue at Port Fairy advising that Inception was taking on water, down by the bow and sinking was imminent. The police initiated an incident and began gathering intelligence on the event, including from the race sheet provided by the ORCV. Shortly after midnight they were advised by the RCC of the EPIRB activation and the yacht's position. It was agreed that Vicpol would look for surface assets and the RCC would coordinate the aviation response.
- 4.24 It was soon apparent that no suitable surface rescue assets were available; the VMR rescue boat at Port Fairy was too small and the larger boat at Warrnambool was unable to exit the port due to hazardous conditions. The police lacked HF communications with the scene and the ORCV shore radio operator and Race Director coordinated the immediate responses to the situation.
- 4.25 A Victoria Police Airwing helicopter was alerted; the helicopter refuelled at Ballarat and began to pre-position at Warrnambool. This aircraft also appears to have acted as a useful radio relay, informing Vicpol of the unfolding situation. This aircraft was not fitted with an auto hover capability or a certified crew and therefore unable to perform a night-time helicopter winching. There was no night time helicopter recovery capability available.
- 4.26 The Vicpol media unit issued a media release shortly after the recovery of the 6 crew members was confirmed. This was not coordinated with ORCV or RCC.
- 4.27 A summary of each of the yachts participating in the race and record of damage and injuries incurred is at Annex D.

5 RESCUE OPERATIONS

5.1 External Resources.

5.1.1 The RCC and Victoria Police provided overall coordination of the rescue. In the absence of any surface assets able to respond in a timely manner and the lack of a helicopter night hover/winch capability, the yacht Trybooking.com was the best-placed asset to respond. The Victorian Police did not have direct communications to contact the yachts and were unaware that Trybooking.com was the closest yacht. The ORCV Race Director, and shore radio operator, displayed commendable initiative by providing the necessary coordination and communications at the scene to alert Trybooking.com and position her to undertake the search.

5.2 Performance of EPIRB and PLBs

5.2.1 Two crewmen in the cockpit activated their PLBs shortly before midnight. Their GPS enabled positions were detected on the satellite at 0003 and by 0006 these had been relayed to the RCC.

5.2.2 Inception's EPIRB was not GPS enabled. It was activated at the same time as the two PLBs and the alert was relayed to the RCC at 0006, without a position. It was noted in the RCC's report that by the end of the rescue at approximately 0200 a fix on this beacon had not been achieved.

5.2.3 Two other crewmembers activated their GPS enabled PLBs after entering the water; one provided a GPS fix at 0028. The other did not achieve a fix prior to completion of the rescue. The two PLBs that had been activated in the cockpit and provided the initial GPS positions, had a designed update interval of 30 minutes, neither of these PLBs achieved an update fix whilst in the water. The failures of these PLBs to achieve fixes probably reflects the difficulty of obtaining a GPS fix from a PLB held close to the surface and being washed over.

5.2.4 One crewman held the Inception's EPIRB clear of the water and did not activate his PLB.

5.2.5 The 6th crewman's PLB was inaccessible in his clothing and not activated.

5.2.6 The registration details held by AMSA for the EPIRB and 5 of the PLB's was correct. The sixth PLB, one of the units not activated, was incorrect, the number held by AMSA referred to an old hire unit and was out of date. Two of the crew had nominated each other as the point of contact on the AMSA registration form and had not provided any alternate points of contact (the form has space for 3 contacts).

- 5.2.7 AMSA advises that under the Australian standard PLB's must float; however unlike an EPIRB, they are not designed to transmit correctly when in this position. As such if deployed in this manner the signal may not correctly radiate and therefore may fail to be detected by the satellite system or search and rescue assets.
- 5.2.8 The preparation of this Report prompted AMSA investigation of the GPS positional update interval for PLB's, as a result they advise that:
- The Cospas-Sarsat standard requires that a PLB provide an encoded (GPs) position within 10 minutes of activation and continue to radiate that GPs position for a further 4 hour period following the initial detection. If no update is received, once this time period has elapsed the beacon will no longer transmit the encoded position.
 - The PLBs that provided the initial GPS positions during the incident were both ACR models. These PLBs are designed under normal conditions to update their encoded position every 30 minutes. This exceeds the Cospas-Sarsat requirements that only require the beacons (as a minimum) to update their internal GPs position on activation only.
 - Other manufacturer's beacons may update at differing intervals.
 - After the initial position report these beacons did not update their position, probably due to the severe environmental conditions encountered and the nature of deployment of the beacons (i.e. held by survivors at surface level and likely being regularly submerged) leading to the degradation of the ability of the beacon to provide a lock onto the GPS satellites and obtain further positions subsequent to the initial detection.
 - It appears that the 0028 PLB position was the initial fix from a 3rd PLB, this beacon was delayed in obtaining a GPS fix by environmental conditions.
 - The time difference between the two sets of PLB positions was fortuitous as it enabled the drift line to be calculated, assisting Trybooking.com in locating the survivors.
- 5.2.9 The Inquiry recognise the excellent educational benefits offered by the ORCV in conducting the YA Safety and Sea Survival Course, this incident raises some important teaching points:
- Activating the EPIRB and PLB before you enter the water is a good idea if possible.
 - GPS enabled EPIRBs and PLBs are much more effective (and worth the money).
 - There is no need to hold an EPIRB in your hands; it is designed to float in the water and work in this position.

- PLBs need to be readily accessible when you are dressed in foul weather gear and a PFD.
- PLBs are not designed to operate whilst floating and should be held or stowed in a suitable pocket clear of the water.
- The update interval is an important feature to be considered in purchasing a PLB.
- Keep your registration details up to date and do provide 3 points of contact, preferably not people whom you are likely to sail with.
- Strongly encourage crew to purchase PFD with a spray hood .

Further investigation is being made into the occurrence and/or risk of Secondary drowning. If this investigation yields relevant information, the Inquiry Panel may issue a subsequent and additional recommendation in regard to spray hoods.

- A properly adjusted PFD harness, in particular, a tight crotch/thigh strap(s) is very important to prevent the PFD's riding up, placing the survivor's face close to or below the surface of the water.

6 PARTICULAR ISSUES

6.1 Race Organisation.

6.1.1 Arrangements for the race appear to have been well managed and in accordance with Yachting Australia Special Regulations 2009–2012. The Chairman of the Sailing Committee, a very experienced offshore sailor and well qualified for his position played a key role in assessing the experience levels of individual yachts, mentoring and preparing the Race Director. The Race Director was not at the start location, he had been involved – along with the Chairman of Sailing and two other committee members/flag officers in the decision to start and in the communications delivered to starters. This is consistent with standard ORCV practice.

6.1.2 We believe that the ORCV should avoid reliance on officials who are afloat as competitors in a race as this is vulnerable to communications delays/breakdowns or other factors affecting their ability to respond in a timely manner.

6.2 Race documentation.

Race documentation was generally comprehensive and correct; we noted errors in the NOK details provided by boats and there are a number of other improvements that we have suggested in our recommendations.

6.3 Support for Race Officials.

The ORCV is to be commended for its efforts to establish an Incident Management Team, set up procedures and train personnel in their use. The arrangements to support the Race Director, with a mobile van with communications facilities and a shore based radio are also commendable. These arrangements all paid dividends in managing the situation successfully. We believe there are some improvements to procedures, equipment, manning arrangements in the van and the shore radio station that can be made and we have detailed these in our recommendations.

6.4 Rescue of Inception's Crew.

The rescue was heavily dependent on the determination and resourcefulness of the Trybooking.com skipper and his crew. Although shorthanded and operating in a severe sea state, the crew were able to develop a working procedure for recovering personnel from the water that should serve as a model for future incidents. Briefing crews in the SSSC on the procedure and some minor equipment preparations should establish this as standard procedure for such circumstances.

6.5 Search and Rescue.

- 6.5.1 The 2 mobile phone calls between Inception's helmsman and the Port Fairy Yacht Club significantly assisted those involved in the SAR operation to understand the situation and respond appropriately. The crew's situation, drifting in the water in mountainous seas some 7 nautical miles off a very rugged lee shore was indeed perilous. The inability of nearby shipping to respond quickly in the weather conditions, the lack of any night hover/winch capability in the rescue helicopters and the very time critical situation facing the Inception crewmembers compounded the risk.
- 6.5.2 In the event there were no surface assets immediately available and as so often might be the case, the nearest rescue vessel was a fellow competitor.
- 6.5.3 The accurate GPS positions from the PLBs and effective coordination by the ORCV Race Director and radio operator in relaying these positions, allowed the timely and effective response by Trybooking.com and saved the day.
- 6.5.4 We consider the situation to be not untypical and have recommended that the ORCV continue and enhance its capability to provide the scene of action coordination for future incidents during ORCV races. We have included a number of recommendations on equipment and procedures to assist in this process.
- 6.5.5 The formal SAR distress procedures were triggered by AMSA's reception of the EPIRB and PLB signals. We believe that under the terms of the National SAR Manual ¹, the Race Director would have been justified to issue a distress alert message (PAN call) on HF/VHF and by phone to AMSA on receipt of the first phone call and a distress message (MAYDAY) on receipt of the second. This would have had the benefit of:
- Triggering the SAR system earlier and with a common, unambiguous understanding of the situation.
 - Alerting other vessels in the proximity, noting that merchant ships do not routinely monitor the HF voice distress frequencies as they utilize an automatic watch on HF DSC.
 - Avoiding reliance solely on the EPIRB/PLBs notification and overcome any failure or delay of those systems to operate correctly.

¹ http://natsar.amsa.gov.au/Manuals/Search_and_Rescue_Manual/Index.asp, paragraph 3.3.3.

- 6.5.6 We recommend that advice on this possibility be included in the briefing/training of the Race Director and included on any checklists prepared for his use. In the event the single-handed Race Director accepted assurances from the Port Fairy VMR member that the SAR authorities had been advised. Additionally he was heavily engaged by the unfolding situation, with little time to contemplate or act on this matter.
- 6.6 Emergency Management.
 - 6.6.1 The structured emergency management procedures worked as designed. The lack of real time information of the yachts positions, such as would be available from a comprehensive AIS shore infrastructure and the shore authorities' inability to communicate directly with the racing fleet, meant that significant responsibility for communications and coordination fell on the ORCV's organisation. We anticipate that this situation is likely to continue into the future and we have recommended some measures in recognition of the reality of this situation.
 - 6.6.2 We believe there is a need for a greater level of understanding of the ORCV's ability to assist the rescue authorities and we have recommended the inclusion of details on the IMT and its capabilities be included in the race briefing provided to these authorities.
- 6.7 Securing Arrangements for Life Rafts
 - 6.7.1 The incident has caused us to view Yachting Australia's Special Regulations and Sailing Instructions from a different perspective. It seems to us that the requirement to be able to get the raft over the side in 15 seconds may lead to storage arrangements that put the raft at risk in severe weather conditions. We believe that the overriding priority is to ensure the security of the life raft – clearly the ready access demanded by the 15 seconds criteria is of little use if the raft has already been washed away. Accordingly we believe the first priority should be a secure stowage that is not vulnerable to being washed away in severe sea conditions. The second priority is the ability to rapidly and safely deploy the raft.
 - 6.7.2 Figure 3 is a photograph of Inception's life raft stowage taken on the day of the incident, some hours before it was washed overboard. It met the 15 second safety requirement and passed the safety assessment – we suggest that it demonstratively failed the real world test on 6 April.



Figure 3 – Inception's Life Raft Stowage 6 April 2012

- 6.7.3 Accordingly, the stowage of the raft must be chosen with the possible worst case in mind. Calculations using data from a nearby wave riding buoy illustrate the quantum of forces involved in a wave driven by a 50 knot wind hitting a raft of the cross section of Inception's. The resultant 3,000 -4,000 Kg force is sensitive to the velocity of the wave at impact, however, the calculations serve to demonstrate the order of magnitude that could occur. In order to clear the guardrail as described by the crew, the raft was probably travelling at 70 ft/second (77 Km/hr) as it passed, airborne between the two crewmembers in the cockpit. . It was fortuitous that the raft did not hit anything or anybody; the result of a 53 Kg life raft hitting a crewmember at 77 Km/hr is unlikely to be a happy one.
- 6.7.4 The priority should therefore be to select a stowage that is not vulnerable to being struck by the full force of a sea coming on board. Having reviewed the loss of life rafts from deck stowage, Adlard Coles' Heavy Weather Sailing comes to the same conclusion:

*"On balance, it does seem best to stow life rafts in a dry dedicated cockpit storage or below."*²

And in a second observation following the loss of Berimilla's life raft in the South Atlantic after wave action physically bent the pelican hook securing the life raft, causing it to open:

"Regarding the loss of the life raft, it can only be said, once again, that life rafts stowed on the deck are tremendously vulnerable to major wave action. How water can bend steel is mystifying, but it does, and how deck-stowed life rafts continually carry away in heavy weather is equally mystifying but, as will be found in several places in previous editions of this book, they do."

^{2 2} Adlard Coles' Heavy Weather Sailing, Peter Bruce, 6th Edition, London, 2008, page 233, 254

- 6.7.5 We also believe there is a need to provide more comprehensive instructions on the securing arrangements for life rafts. Instructions should be included on the mounting arrangements. These should include shaped chocks and pad eyes for fitting securing straps to hold a raft firmly in position if it is on the upper deck – suitably sheltered from the full impact of a sea coming onboard. These fittings should be through bolted to the boat's superstructure (not screwed) and adequate to ensure that the raft can survive the impact and force of immersion in green water. Advice should also be provided on the type and strength of the securing straps and lashings. The straps and lashings should have a level of redundancy; ie there should be at least two, independent straps used to secure the raft so that failure of one securing strap/lashing should not lead to the failure of all securing arrangements.
- 6.7.6 We note that the ISAF offshore special regulations and the Yachting New Zealand equivalent include instructions on through bolting (paragraph 17.12.C).
- 6.7.7 Further, the regulations should require the raft lanyard/painter be secured to a strong anchor point, with sufficient strength to hold an inflated raft with crew embarked in severe wind and sea conditions. This fitting should also be through bolted.
- 6.7.8 All these points should be covered in the SSSC training and checked during the ORCV's safety audits.
- 6.8 Weather
- 6.8.1 We are satisfied that the Chairman of The Race Committee and other ORCV officials took all reasonable steps to inform themselves of the expected weather and that the decision to start the race was reasonable given the forecasts provided prior to the race.
- 6.8.2 It is apparent that the weather forecasts and wind models did not foresee the storm force winds that eventuated. To be fair to the forecasters, this could have been caused by a local phenomenon, a sudden intensification of the low pressure system driving the front, combined with the oceanography of this notorious strip of coastline, where the Great Southern Ocean meets the approaches to Bass Strait and Cape Otway. There was little indication of storm force winds at the BOM shore station at Cape Nelson, some 70 nautical miles westward of the incident. An extract of these observations is at Annex G Appendix 2.
- 6.8.3 The BOM coastal wind warning issued before the start at 2224 on Thursday 5 April 2012 and subsequent warnings issued thereafter at regular intervals during 6 April 2012 were fairly consistent in forecasts:

- Northerly wind up to 30 knots, tending West to North-westerly before a South-westerly change, increasing to 35-40 knots, with a combined sea and swell of up to 5-6 m.
- At 1616 on Friday, 6 April the forecast wind speed was increased to 45knots and sea state to 6m.
- At 1650 this was reduced to 40 knots and a sea state of 5m.
- The final coastal wind warning before the incident, issued at 2143 warned of 35-45 knots South-westerly winds and a combined sea and swell of 6m.

6.8.4 Summaries of the Bureau of Meteorology (BOM) weather forecasts for the area, BOM warnings, Cape Nelson coastal station observations and records from a nearby wave-riding buoy are at Annex G Appendix 1, 2 and 3 respectively.

6.8.5 Wave rider buoy data from the buoy off Port Campbell, very near the incident is attached at Annex G, Appendix 2. This show that the significant wave height in the area at the time of the incident was 6.1 metres, the top of the BOM's forecast range; this is an average height - the maximum height of waves was over 10 metres.

6.8.6 These real world observations tend to reinforce the well-earned notoriety of this stretch of coastline as a difficult and dangerous area – it is called the 'shipwreck coast' for good reason. The lesson learnt is the need for great care in negotiating the area in severe weather. Race Directors and skippers should be reminded of this advice in the years to come in preparing for this race.

7 ANALYSIS AND INDIVIDUAL RECOMMENDATIONS

7.1 Race Organisation

- 7.1.1 The race was organised in accordance with ORCV's procedures and these appear to have been generally adequate. This was the Race Director's first race, in this role. He is an experienced offshore sailor and was well supported and prepared by the Race Committee Chairman. It is understood that the Race Committee Chairman has an unwritten limit for conducting a race; it should not start or be continued if storm force conditions or a combined sea state greater than 8m are likely to be encountered.
- 7.1.2 This seems to us to be reasonable limitations and we recommend that the club promulgate these limitations in its procedures and documentation, for the benefit of competitors and the Race Director. Sailing Instructions should require a yacht experiencing storm force winds to promptly advise the Race Director, who will advise other competitors. Had competitors been aware of the limit and advised the Race Director of the conditions being experienced he may then have considered abandoning the race on the afternoon of 6 April, giving yachts some incentive to stop racing and head for shelter whilst it was still daylight.
- 7.1.3 It should be noted that it is not clear that this would have made any difference to the outcome for Inception; they had already ceased racing and were concentrating on keeping the boat and crew safe and intact and had decided that running before the wind was not an option they wished to pursue.
- 7.1.4 We regard the decision made by one yacht not-to-start and for some others that withdrew early in the event as a testament to good seamanship and the ORCV safety practices. The ORCV Race Director (through the pre-race radio briefing) ensured that all were dictated the BOM forecasts and had the YA RRS fundamental Rule 4 read to all boats to remind them that "The responsibility for a boat's decision to participate in a race or to continue racing is hers alone".

7.2 Rescue Arrangements

7.2.1 It is concluded that without the coordination exercised at the scene by the Race Director and ORCV radio operator, the outcome for Inception's crew may not have been a happy one. It appears to us that this situation could well occur again in the future and we recommend that the ORCV make the necessary arrangements in training, manning and equipping key personnel in order to be able to provide coordination at the scene of an incident. This will entail a significant shift in how the ORCV manages these events and views the role of the Race Director. These changes are reflected in recommendations in the paragraphs below.

7.2.2 We recommend the following measures:

- Setting up the ORCV's mobile van with the capability to act as a VHF DSC capable shore station.
- Fitting the van to be able to receive and display AIS information.
- Continuing the current practice with the van and shore radio station currently fitted with suitable electronic chart display information systems, loaded with electronic charts to enable them to coordinate an incident in any of the waters sailed in by the ORCV.
- Providing a soft copy of the National SAR Manual in the van and at the shore radio site.
- Ensuring that the Race Director and shore radio operator are familiar with the contents of the manual.
- Briefing the Race Director that in exceptional circumstances he may need to issue an alert or distress messages (either directly from the van or via the shore radio operator) where a yacht is unable to do so.
- Manning the van with at least 2 trained personnel and positioning it to provide the most effective communication coverage over the racing fleet.
- Separate arrangements should be made to manage the finishing line, recording of yachts finishing times etc.
- The incident management team should include a standby radio operator able to assist the shore radio operator if required.

7.3 Race Documentation

7.3.1 The race documentation complied with the ORCV's procedures and practices and was consistent with Yachting Australia's Special Regulations.

- 7.3.2 We consider that the exposed conditions often experienced in ORCV races in and around the Western end of Bass Strait and down the West coast of Tasmania warrant additional measures to be implemented by the ORCV, over and above the Yachting Australia requirements and these are encompassed in our individual recommendations.
- 7.4 Support for Race Officials
- 7.4.1 The two-man team controlling the race; the Race Director and the ORCV's shore radio operator were severely stretched in managing this incident. The primary focus of the Race Director should be the safe conduct of the race, not operating the finishing line.
- 7.4.2 The Race Director had no involvement in the start and first section of the race; this was managed by the Chairman of the Sailing Committee, crewing in one of the competing yachts. Whilst we are not critical of the decisions made on this occasion by this individual we feel that the focus of pre and post start decisions in this position renders the ORCV vulnerable to a future failure by a single decision maker. We recommend formalising and documenting the role and involvement of a Flag Officer or suitably experienced person in the processes leading up to the race. This person should also be available to assist in key decisions by the Race Director throughout the race.
- 7.4.3 By 2335 the Race Director had already had a long day, having driven down from Melbourne to Port Fairy in the early hours of Friday morning (0300-0730). In his lone position at the finishing line he was indeed a 'one man band' (another single decision maker) and had this incident continued for a longer period or become more complex, then fatigue and workload would have limited his effectiveness. The shore radio operator is better placed, operating in his own home, but may also require assistance in the event of a complex or long running incident. The additional manpower recommended above is intended to overcome this limitation.
- 7.4.4 Whilst the members of the incident management team are listed in the race documentation, a leader of the team is not nominated and it is left to the Race Director to contact one of the IMT members in order to activate the team. We recommend the following changes to the IMT arrangements:
- One of the members should be nominated as the team leader and carry an ORCV provided mobile telephone.
 - This number should be made available to the competing yachts. Crew members should be advised to inform their next of kin that this is the initial point of contact if they have any concerns or queries.
 - The number should also be provided to Victorian Police, AMSA and any other SAR authorities included in the advice about the race.

- Whenever there is the possibility of a casualty the IMT team Doctor should invariably and immediately be activated, as part of the ORCV's initial response to an incident.
- The IMT doctor should then be available to provide proactive medical support throughout an incident.
- The IMT should be the normal method for communicating with the NOK.
- Crews should be advised of the IMT contact number and be asked to inform their NOK accordingly – a fridge magnet may assist in keeping the details handy.
- The pre-race information provided to the search and rescue authorities should explain this arrangement and indicate that these resources are available to assist them in discharging their responsibilities.

7.5 Rescue of the Crew from Inception

- 7.5.1 Trybooking.com's crew displayed a great deal of resourcefulness, determination and courage to effect the rescue. We recommend that these efforts should be appropriately, publicly recognized.
- 7.5.2 The procedures they adopted to calculate the datum, allow for drift and manoeuvre the yacht to enable recovery over the transom step worked well and should be used as an example in SSSC in training for yachts with a similar stern configuration.
- 7.5.3 There is an important caveat to this recommendation. The need to manage the arrival of the survivor in time with the movement of the yacht, in order to avoid them being drawn under the transom and injured should be emphasized in any training.
- 7.5.4 Our next recommendation is targeted at a mindset change for all skippers and crew; to consider and pre-plan how they would undertake a rescue of personnel from the water or a life raft. Like all mindset changes this can be expected to be difficult to achieve and take time. The subject is taught on the SSSC, some additional emphasis on this may be appropriate. It should also be tackled across a range of media, newsletters and ORCV documentation; the message to get across – 'you could be the next Trybooking.com – ensure you are prepared'.
- 7.5.5 In line with this recommendation, we have several recommendations:
- We note that the rescue was made more difficult by the weight of people still in the water pulling on those being recovered since they remained tethered together. (Two crewmembers selflessly detached themselves to reduce the problem; this could have led to further complications had they drifted away.)

- We recommend investigation and trialling of a suitable arrangement to handle the retention of multiple survivors in the water whilst a rescue is effected. Any solution must balance a number of difficult factors; the priority should be to avoid survivors drifting off individually whilst the rescue is completed.
- A possible suggested arrangement could be:
 - A length of buoyant line (it is important that it floats, to keep it clear of the propeller), with a number of rescue quoit size loops (for ease of reference we have called it a 'daisy chain') be made up by each yacht and included in their safety gear.
 - The 'daisy chain' is intended to be streamed astern of the rescue yacht and provide a secure method for survivors to attach themselves to that yacht, prior to detaching from each other.
 - Once attached to the 'daisy chain' they should detach from each other.
 - A short line or the life sling can then be used to securely attach to each survivor before they detach from the 'daisy chain' to be brought over the transom or alongside for recovery by parbuckling over the side; depending on the layout of the rescuing yacht.
 - The rescue yacht would need to maintain sufficient steerage way to avoid the survivors acting as a drogue and causing the bow to drop off and head down wind.
- The need for gentle, HORIZONTAL handling of a hypothermic casualty should be emphasised in training and drills. We appreciate that this must be balanced by the need to effect the recovery and the circumstances in the yacht at the time, but consider it is a point worth emphasising in training because of the practical difficulties that it can pose. ³

7.5.6 We recommend that each yacht should nominate a 'swimmer of the watch' and carry the gear necessary to undertake the rescue of an incapacitated survivor using a swimmer. The ISAF Offshore Special regulations para 4.21.4 provide advice on the gear, which is required for a category 0 race. In our opinion it should be a requirement for all offshore races (Category 0-3); it seems to us that the chance of needing this capability is independent of the degree of race exposure. A wet suit suitable for the likely water temperature should be used.

³ Yachting Australia Special regulations Part 1 Appendix D, page 271

- 7.5.7 As discussed at paragraph 7.2 above, it was noted that all of the PLBs experienced difficulties in obtaining a GPS fix whilst in the water. One of the PLBs activated in the water took some time to register a GPS fix on the satellite and the fourth PLB never achieved a fix, whereas fixes from the two PLBs activated before the crew went into the water were quickly detected. There is a training lesson here; if circumstances allow, activation before entering the water is preferable.
- 7.5.8 It was noted that crew endeavoured to hold their PLB's above the water. This is tiring and potentially hazardous; it renders the PLB vulnerable to being dropped and it takes up a hand that could be better used, to hold on, protect the face, swim, etc. We recommend approaching the offshore equipment suppliers with a view to modifying PFDs to provide for pockets to hold a PLB, to obviate the need for holding PLBs or personal strobe lights by hand. We note that some PFD's may already provide this feature.⁴

⁴ <http://www.youtube.com/watch?v=FERCChjzSsM>



Figure 4 – Baltic Lifejacket's Kannad R-10 PLB with mesh pocket for a PLB on the left hand yoke developed for SAR personnel in Sweden (not currently available in Australia)

- 7.5.9 The fitting of an AIS Search And Rescue Transponder (SART) to PFDs would also appear to provide an effective method of tracking a survivor in real time by vessels or aircraft fitted with an AIS receiver and should be further investigated. These SARTs have a low power output, limiting the range of detection and should be regarded as a complement to a PLB, not a replacement. This appears to be a developing field, with a number of manufacturers offering suitable technology.⁵



Figure 5 - An example of an AIS SART the Kannad SRS R10 fitted to the right hand yoke, aerial deployed

⁵ Two <http://www.kannadmarine.com/us/safelink-r10>

<http://www.secumar.com/secumar/php/main.php?mnid=131&lang=e&group=php&seite=news&id=613>

- 7.5.10 Ensuring up to date NOK details relies on an accurate input from the crews. We suggest that competitors should be electronically provided with a copy of their data set held by ORCV for verification a day or so prior to the start and be reminded of the need for up to date NOK details at the pre start sign on schedule.
- 7.6 Support for crew involved in the Race.
- 7.6.1 The Inquiry Panel recognises the ongoing support given to crews involved in the Race by the ORCV, including the debrief for all crews on all yachts who participated, at RBYC on 19 April 2012, peer review session for the crew of Inception, IMT liaison with professionals specialised in the area of post-traumatic stress and dissemination of this information and regular follow-up with members of the Inception crew.
- 7.6.2 The Inquiry team had neither the capability nor the time to investigate these aspects adequately and we recommend an additional review of the post-traumatic stress aspects of the Incident Management Plan and actions undertaken on this occasion, by suitably qualified personnel to determine the need for changes and any further assistance that can be given.
- 7.7 Communications
- 7.7.1 We have a number of communications related recommendations, some of these are within the remit of the ORCV; many will require action by other authorities. In these cases we suggest the ORCV should be proactive in seeking the necessary changes:
- All yachts should be encouraged to fit a Type B AIS transponder to assist in collision avoidance and incident management.
 - The ORCV should promote adoption of DSC VHF radios for all yachts competing in ORCV races. There are several resulting benefits that are relevant to this incident:
 - One button distress signalling with the yacht's identity, position and an option to include the nature of the distress – freeing personnel for more urgent tasks on board.
 - This facility has a 25% longer range than a voice distress call.
 - The distress message is automatically re-transmitted until acknowledged.
 - The alarm generated in a receiving DSC radio will attract the attention of nearby competitors and shipping – i.e. the closest source of rescue.
 - The ability for the ORCV to send group messages and position poll all competitors. On this occasion this capability could have facilitated issuing an alert about severe weather.

- As we have noted earlier, the ORCV van should be fitted as a DSC capable VHF shore station to exploit the full benefit of these changes.

- 7.7.2 To gain maximum advantage from this technology we recommend that the ORCV require the fitting of sets with a Class D DSC capability, ie a capability for single button distress call and full selective messaging, group calls, position polling etc. Since most modern marine VHF sets have the DSC facility fitted, many sets will be able to achieve this requirement with the correct installation, operator training and set registration. We understand that there can be problems involving compatibility between the electronic systems on board and the DSC VHF radio's need for GPS positioning data, so this installation needs to be correctly performed.
- 7.7.3 The ORCV should assist with training and information on its use, give an adequate lead-time and then mandate its use. This recommendation is supported by the findings of the Flinders Island yacht race incident.⁶
- 7.7.4 We recommend the ORCV lobby for improvements in utilisation of the benefits of VHF DSC in Victoria and Tasmania.
- 7.7.5 Yachts and shipping within VHF range provide the closest options for assistance. Yachts competing in all ORCV races should forthwith be required to keep a listening watch on VHF Channel 16 and the race management frequency where a dual channel capability is available. Yachts should be encouraged to fit a cockpit loudspeaker for this purpose.
- 7.7.6 Mobile phones played a key role in managing this incident. Their use should be made more effective by providing all competitors with a number for the Race Director and IMT leader's mobile phones as a point of contact:
- The van arrangements should include aerial installation to ensure the best possible coverage for the Race Director's mobile phones.
 - We commend the current practice of providing the Race Director with a second phone whose number is only known to ORCV officials to ensure he can be contacted in moments of high activity.
 - Yachts should be encouraged to fit masthead antennae and subscribe to the network providing the best coverage in race areas.
 - Yachts should be advised of the standing mobile phone numbers for the Race director and IMT leader and advised to contact the Race Director early during any incident.
- 7.7.7 Yacht tracker information should be automatically routed to AMSA and Vicpol.

⁶ Flinders Islet Yacht Race Inquiry, Cruising Yacht Club of Australia, *Oxenbould, Kellet and Brooks*, January 2010, paragraph 154.

- 7.7.8 We recommend encouraging yachts to carry a satellite telephone, **programmed with the key numbers for the race, to provide an** additional line of communications, particularly for longer distance races.
- 7.7.9 Choosing the best HF frequency for broadcasting an urgency/ distress message was an issue raised during the inquiry. After considering the issues we believe that on balance, yachts should be advised to make any initial urgency or distress call on the race frequency. This has the benefit of alerting those perhaps best positioned to assist them; ie the Race Director, ORCV shore radio operator and any fellow competitors listening on the race frequency. These authorities can then relay the urgency or distress call, leaving the boat free to deal with the problem. In the event that the call is not acknowledged then repeating the message on one of the distress calling frequencies is appropriate. It follows that yachts choosing to keep a listening watch on HF should be encouraged to listen to the race frequency.
- 7.7.10 We recommend encouraging yachts to store a waterproof VHF set in the grab bag. It should not be used as a day-to-day radio, in order to ensure that it is fully charged should it be required. Its' state of charge and serviceability should be checked before the race (the checklist at Annex E Appendix 2 refers).
- 7.8 Emergency Management
- 7.8.1 We accept AMSA and Victoria Police's response to our initial suggestion of an MOU between AMSA, Vicpol and the ORCV as being impractical on a national scale and agree AMSA's suggestion for a 'Guidance Document', negotiated between Yachting Australia, States and Territories SAR Authorities and AMSA setting out agreed delineation of responsibilities for the management of SAR incidents arising during yacht races.
- 7.8.2 The 'Guidance Document' approach would allow for a comprehensive approach to be developed and provide information relating to the SAR System, points of contact in States and Territories and include details of what information is expected to be prepared prior to a race and disseminated to SAR Authorities involved and also what is required to be held by the yacht race organisers, including information relating to yacht tracking and also their responsibilities pertaining to the race.
- 7.9 Special Regulations and Sailing Instructions
- 7.9.1 Safety instructions and audits to check compliance should be amended as follows:
- Instructions on the securing arrangements for life rafts.
 - This is discussed above at paragraphs 6.7.3– 6.7.8 above.
- 7.10 Yacht Management

- 7.10.1 Watch Keeping Routine. In discussion with crews from several boats it was apparent that some yachts did not establish a regular watch keeping and meals routine. This rendered the crews more vulnerable to fatigue, injury and poor decision making as the race progressed, exacerbated by the deteriorating weather. The subject is taught on the SSSC, some additional emphasis on this, including the rolling changeover of watches and heavy weather watch keeping routines may be appropriate.
- 7.10.2 Preparations for Heavy Weather. An organised approach to preparing for heavy weather is required. The RYA Sea Survival Handbook Chapter 3 provides some useful discussion. It was apparent from discussions with some crews that such a process was not followed. We advocate a publicly declared decision by the Skipper to 'stop racing' and focus on preserving the boat and crew to impress upon all that the priorities have changed. This does not necessarily mean abandoning the race; racing can resume when the weather abates.
- 7.10.3 Checklists. The use of checklists to ensure the boat is properly prepared and for pre-planned emergency responses is highly recommended. These need to be adapted for each yacht; we have attached a sample of some checklists, including a heavy weather sailing checklist at Annex E as an example. We recommend that these be made available to all ORCV skippers.
- 7.10.4 Use of Parachute Sea Anchors. The use of a properly rigged, suitably sized parachute sea anchor to allow the yacht to lie head to sea and control leeway adds a valuable option for yacht's experiencing such conditions, particularly if they have experienced damage affecting their mobility (ie dismasted, engine failure etc). There is a useful discussion on these devices in Adlard Coles' Heavy Weather Sailing ⁷ which also includes some real world examples of their successful employment. The SSSC course mentions parachute sea anchors; ⁸ it would appear that the advice is in need of updating and emphasis.
- 7.10.5 Sea Cocks.
- 7.10.5.1 Management. Sea cocks are a potentially dangerous source of flooding. It is recommended that the SSSC emphasise the care required in managing them. Skippers should be encouraged to:
- Shut sea cocks when not in use.
 - Include them on the heavy weather checklist to ensure they are shut.

⁷ Adlard Coles' Heavy Weather Sailing 6th edition, *Peter Bruce*, London 2008

⁸ ORCV Safety & Sea Survival Course Handbook, Part A, page 75

- Allocate a high priority to checking they are shut in the event of water being found in the boat.
- Regularly visually inspect them and undertake a professional technical survey if there is any doubt about their integrity and fitness for purpose.

7.10.5.2 Incorrect Material. The possible use of brass in sea cocks is an issue reported from UK following a change in the European standard. This is a potentially hazardous situation, since brass is subject to electrolysis action and may fail after a period of exposure to seawater. We are not aware of the extent of this problem in Australian production boats manufactured in Europe.

7.10.6 Handling A Lee Shore In Heavy Weather

7.10.6.1 As they rounded Cape Otway yachts were aware that they could expect a gale force North Westerly - South Westerly change. Each yacht's risk calculation should have included the contingency of losing the rig off such a treacherous lee shore. As the wind built beyond gale to storm force a fresh risk calculation would have been appropriate. The risk calculation might have gone along the following lines:

- It will take 40-60 minutes to clear away the rig after dismasting (now might be the time to get the necessary tools to hand, with lanyards attached).
- During this time with the rig as a sea anchor the yacht will drift at about 6 knots, (we will be unable to use the engine due to lines in the water).
- I wish to stay out of the confused seas close in off the cliffs and provide a safety buffer, so no closer than say 5 nautical miles.
- So I need to be at least 6+5, say at least 12 nm offshore, preferably more.

7.10.6.2 Given this worst-case risk calculation, a prudent approach at the start of the gale would have been to settle on the starboard tack and move out to the west/south-west until at least 12 nm offshore. This tactic would have the additional advantages of a longer, more stable sea state in the deeper water and also positioning the yacht to take advantage of the South Westerly shift allowing a tack onto Port tack to obtain a favourable lead for Port Fairy.

7.10.6.3 It was apparent from discussions with the two skippers most involved in this incident that their calculation and risk management mindset was not as stark, e.g. one boat had selected 5 nm as the closest point of approach to the coast.

7.10.6.4 The incident provides some useful training points for skippers on conducting this type of risk calculation and the realities of trying to clear away the rig after a dismasting in such circumstances. In this case such a calculation may also have influenced the decision for two relatively inexperienced, short-handed crews on whether to abandon the race and retreat to Apollo Bay, the nearest accessible shelter.

7.10.7 Heavy Weather Routine

7.10.7.1 We have provided some advice on heavy weather routine by way of a Checklist at Annex E Appendix 5.

7.10.8 Safety & Sea Survival Course (SSSC)

7.10.8.1 The ORCV is to be commended for its conduct of Yachting Australia's SSSC; the handbook and the RYA Sea Survival Handbook issued to all graduates of the course is an impressive collection of wise advice. There are a number of areas where this can be improved and a review of the SSSC handbook by an appropriately experienced panel is recommended. Some suggestions are briefly set out below. We appreciate that some of these may be beyond the remit of the ORCV and encourage the ORCV to start the process of seeking amendment by Yachting Australia.

7.10.8.2 The course is now very busy and intense. We heard some suggestions that it is now at risk of information overload. Some suggestions for improvement that we suggest are worth considering:

- Providing a separate course for Skippers and watch leaders – i.e. the 3 key decision makers per boat, over and above the content of the SSSC on risk management and decision making.
- Making it mandatory that 3 people on each yacht, or both crew members of a two handed yacht have completed this course before undertaking any Category ORCV 2 or higher race.
- Skippers and watch leaders should be required to undertake both courses.

7.10.8.3 Areas for specific improvement arising from consideration of this incident include the following, (this examination is by no means exhaustive):

- *Page 96. Flooding.* The suggested priorities are:
 - Find and stem the leak.
Action to do so needs to be aggressive and urgent
 - Prepare for the worst.
 - See the Checklist at Annex E Appendix 3.

- *Page 92. Loss of Mast.* Shrouds are not easy to cut, particularly with the boat and rig moving around in heavy seas. In this author's (happily limited) experience, by far the quickest way is to:
 - Leave the halyards until last, they are easily cut and may serve to keep the weight off the shrouds.
 - Remove the shrouds, forestay and any standing backstay first.
 - Do this by removing shackles or in the case of shrouds/forestay, the split pins and knock out the clevis pin attaching them to the chain plate.
 - A pair of large pliers and pair of side cutters (each with securing lanyards on their handles) is required.

7.10.8.4 We recommend that advice on this matter be included in the SSSC delivered to skippers and watch leaders.

7.10.9 Bilges

7.10.9.1 Skippers and crew should be familiar with the bilge arrangements of their boat. This is important to be able to trace leaks and to check that limber holes in bulkheads are free to run.

7.10.9.2 Dependent on the head of water at the hull fitting, a breech in the pipe/seacock or a submerged head/shower/basin could quickly exceed the capacity of the typical electric bilge pump. For example, a 1" opening with associated pipe work⁹ and open ball valve will allow 51 litres/minute at a 2m depth and a 1.5" opening (this size pipe work is typically used on a head) will admit 144 litres/minute. In this case Inception's electric bilge pump had a theoretical capacity of 17 litre/minute, this would be reduced by the associated pipe work and valves,¹⁰ say a practical capacity of 12 litre/minute. The bilge pump is also limited by its sump position on the centerline; in a heeled yacht the water collects in the leeward bilge and is inaccessible to the pump. It is important therefore that:

- Finding and stopping the source of the leak is the first and overwhelming priority.
- Skippers should seriously consider fitting additional bilge pumping capacity to provide additional capacity and redundancy in the event of a pump becoming blocked.
- An engine driven bilge pump has significantly more pumping capacity than a typical electrical pump. A suitable pump, fitted with suction arrangements to reach either (leeward) bilge or centreline sumps is probably the only practical countermeasure to a sea cock that has failed and cannot be plugged.

7.10.9.3 Unmanned compartments such as Inception's 'Skippers Cabin' require special arrangements, such as a separate bilge pump and /or a bilge alarm to alert the skipper to the presence of water since:

- This compartment would be very difficult to access in a heavy sea.
- Very difficult to pump out if the limber holes become blocked. In this case the number 1 jib would have first to be removed before gaining access to manually bail out the cabin.
- A quantity of water would have a major impact on the handling of the boat given its position at the bow of the boat, shifting the centre of buoyancy and pivot point forward and reducing the effectiveness of the rudder.

7.10.9.4 A compartment that can only be accessed by an exposed upper deck hatch, such as this, poses particular hazards in the event it becomes flooded. An emergency access from below decks would be useful in mitigating these risks.

⁹ The calculation allows for 2m of pipe, 2 medium radius elbows and 1 full bore ball valve in each case.

¹⁰ Naval architect estimate of -30% has been used.

7.10.9.5 Once the forward cabin was flooded Inception's skipper faced no easy options and a very difficult decision to overcome the situation. This is discussed further in Annex F.

7.10.10 Personal Gear

7.10.10.1 The need for all crewmembers to carry a waterproof personal torch (a small, waterproof head torch with a red filter is particularly useful for working around the cockpit and upper deck and leaves your hands free to work with), knife, strobe and PLB in an accessible spot when they are wearing safety harness and PFD was reinforced by this incident.

7.10.10.2 Several injuries occurred in the fleet when people were thrown to the limit of their safety harness tether. The use of tethers with a mid-point clip to avoid this should be emphasised in training.

7.10.10.3 Spray and water inhalation was an issue for the survivors and they swam to face down sea to reduce the risk of water inhalation, expending significant energy to do so. There can be no doubt that spray hoods would have been beneficial and it is strongly recommended that the SSSC should emphasize the benefits of a PFD fitted with a spray hood to reduce the risk of secondary drowning from the inhalation of sea spray.

8 WHY DID INCEPTION SINK?

- 8.1 A sequence of the possible events leading to the sinking based on knowledgeable supposition, using the accounts given by the crew of Inception, a review of the Beneteau 50 Owner's handbook and discussion with two naval architects with experience in yacht design is at Annex F. Understanding the likely reasons is a useful input to the lessons learnt process and underpins some of the recommendations made above.
- 8.2 We do not believe there was a catastrophic impact with a submerged object leading to flooding – none of the witnesses noted such an event. Instead the process probably proceeded in 3 phases as a sequence of events unfolded and combined to result in the sinking.
- 8.3 We believe that adoption of the procedures and management practices we have recommended above would have done much to avoid or prevent the initial flooding or detected its occurrence much earlier, enabling action to break the sequence of events that probably led to the sinking.

9 CONCLUSIONS

- 9.1 We conclude that examination of the 2012 Melbourne to Port Fairy yacht race, including the incident surrounding the loss of the yacht Inception does not expose any substantial failures in the ORCV's procedures or practice. On the contrary the management of the race, sea survival training, and preparation of the Incident Management team were largely vindicated by the incident. We recommend that the ORCV make changes to the role, training and support arrangements for the Race Director as set out above, in order to ensure that it is well placed to handle any future incidents.
- 9.2 There are a number of procedural and equipment improvements that the ORCV can make to benefit from this examination of the race and improve any responses to a future incident, we have set these out above.
- 9.3 We have also recommended changes to national regulations and external coordination arrangements with SAR authorities to improve the handling of any future incident. These are discussed above and summarized in Annex H below.
- 9.4 Anyone who considers this incident will conclude that the crew of Inception was very lucky to have survived this event unscathed. This brings us to our final conclusion and what is in our opinion, the most important conclusion; that there is the need for the key decision-makers on-board racing yachts to take a methodical and logical approach to assessing and acting to reduce risks. This will entail a broad based campaign and changes in their training and education to assist them to learn from this loss and avoid a recurrence.

- 9.5 There are two issues that we did not have the opportunity to pursue:
- 9.5.1 The possible use of brass in the sea cocks of some European production yachts. Given the incidence of this problem in the UK we recommend that the matter be further investigated.
- 9.5.2 The management of the critical incident stress response for the crews of Inception and Trybooking.com. We recommend that a suitably qualified and experienced person examine this issue to draw out any areas for improvement.

10 RECOMMENDATIONS

A summary of recommendations made in this Report is provided at Annex H.

Peter Briggs

Peter Little

David Ellis

Adam Manders

Annexes:

- A. Terms of Reference
- B. Inquiry Panel CVs
- C. List of Interviews
- D. List of Yachts Competing In The 2012 Melbourne – Port Fairy Yacht Race and Their final Disposition On Completion
- E. Sample Checklists
- F. Possible Flooding Sequence.
- G. Summary of Weather Forecasts, Coastal Stations Observations and Wave Rider Buoys Data
- H. Summary of Recommendations.
- I. Force Of Wave Impact On Life Raft

Annex A

Terms of Reference

ORCV Internal Inquiry into the Port Fairy Yacht Race Incident

- A. At 00:00 hours at Queenscliff on Friday, 6 April 2012, the ORCV started its annual Port Fairy Yacht Race. There were 14 yachts that arrived registered. 12 started and one finished.
- B. During this race the weather deteriorated and the wind increased to storm levels and almost all of the yachts experienced equipment loss or damage and/or crew injuries including the yacht that finished.
- C. Around mid-night on Saturday, 7 April 2012, the yacht, 'Inception' with a crew of 6 foundered some distance off Port Campbell and the crew 'abandoned ship' into the sea.
- D. A little after midnight on Saturday, 7 April 2012, ORCV requested the yacht 'Try Booking.com', who was competing in the race, to provide assistance to the crew from Inception and succeeded in rescuing all 6 crew of Inception within about 2.5 hours in trying circumstances. When rescued only one crewman was affected by the time in the water but recovered before arriving at Port Fairy. The crew suffered no other injuries.
- E. The ORCV Committee resolved to hold an Inquiry, and invited Rear Admiral P D Briggs AO CSC RAN (Retired), Mr Adam Manders, Mr David Ellis and Mr Peter Little to conduct an enquiry into the race on the basis of these Terms of Reference ("the Inquiry").
- F. We are not aware that the ORCV is obliged to provide any reports on this event to any authorities.
- G. The ORCV is not aware of any other bodies conducting enquiries.

1. The purpose of the Inquiry is to assist the ORCV in improving its policies, practices, procedures and training. There is to be no findings of fact or determinations.
2. Rear Admiral Peter Briggs is to be the Chair of the Inquiry, assisted by three panel members.
3. ORCV, through its office, is to provide the Secretariat to the Inquiry. The cost and expense of the Inquiry will be borne by the ORCV.
4. This Inquiry has no power to require people to attend its sittings or answer the panel's questions. The Inquiry is to function on a voluntary basis. People are invited to attend. She or he can attend or not and determine what, if anything, he or she may want to say. The panel or anyone else will be testing the veracity as to the truth of the information provided by anyone involved in the 2012 M2PF Yacht Race. The panel has no power to make findings of facts or make any determinations including any alleged breaches of any rules or regulations by a person or a yacht.
5. The Inquiry and any report produced by it, is not to attribute blame or alleged any breaches of any rule or regulation against any person or yacht involved in the race.
6. The Inquiry Panel will meet to hear the information from those involved at such times, in such places and in such numbers as the Chair shall determine.
7. By 1 June 2012, the Inquiry is to provide an interim report for consideration by the ORCV Committee. The Inquiry Panel will provide a list of further issues that will require considerable information and/or research. It is for the ORCV Committee to consider and provide by way of comment to the Inquiry Panel what if any of the list the ORCV would like the Inquiry to further examine in order to provide a final report.
8. The Inquiry may seek input from:
 - (a) Any member of the ORCV Race Committee and any other ORCV officials involved in the organisation or administration of the race from ORCV;
 - (b) Any crew member from any yacht that competed in the race;
 - (c) Any person involved in the rescue of the crew of Inception; and
 - (d) Any person from the Port Fairy Yacht Club and the Port Fairy Marine Rescue Service;
 - (e) Any person from the Bureau of Meteorology;
 - (f) Any other persons as the Inquiry sees fit.

9. The Inquiry may receive written submissions from any person identified in paragraph 8 above.
10. The ORCV Committee may from time to time provide additional terms of reference to the Inquiry.

The Terms of Reference

11. The Inquiry Panel is to examine all necessary surrounding circumstances pertaining to the 2012 Melbourne to Port Fairy Yacht Race (“the 2012 M2PF Yacht Race”). In particular, the Inquiry Panel is to:
 - (a) Identify, examine and review the ORCV’s policies and procedures:
 - (i) To plan, prepare and co-ordinate ocean races; and
 - (ii) In relation to an emergency during an ocean race.
 - (b) Give its view as to the adequacy and/or deficiencies of the procedures in sub-paragraph 11(a) above;
 - (c) Compare sub-paragraph 11(a) to what the ORCV officials did for the 2012 M2PF Yacht Race; and ascertain if the ORCV followed its own procedures, and, where relevant, identify differences and improvements; and
 - (d) Provide any recommendations for any changes the Inquiry Panel sees fit.
 - (e) Further, identify relevant issues and discuss them. Where possible make recommendations in relation to:
 - (i) The safety requirements and the deployment of safety gear on yachts;
 - (ii) Search and rescue procedures;
 - (iii) Emergency management procedures;
 - (iv) The requirements for eligibility of boats and crew, and the rules and regulations applicable to boats in Category 2 races conducted by ORCV, as specified in the Notice of Race and Sailing Instructions;
 - (v) The training of crews; and
 - (f) Consider such other matters that may arise as a result of the Inquiry’s investigation.

Annex B

ORCV Inquiry Panel Members Details

Rear Admiral Peter Briggs AO CSC RAN Retired

Peter retired from the RAN in 2001 after a 40 year career with extensive command experience, including two submarine commands. He is a qualified Yachmaster Ocean. During an offshore sailing career spanning 46 years Peter has competed in CYCA, ORCV and RORC offshore racing series including several Sydney-Hobart Races, Melbourne-Hobart ('Westcoaster') Races and two Fastnet Races. He has a long-term interest in offshore sailing safety, having campaigned in the 1990s for changes in procedures and equipments that are now standard for offshore races. He maintains an abiding interest in submarine matters, wilderness walking and more recently, has been active as a Field Officer with Bushwalking Search and Rescue in Victoria.

David Ellis

David started sailing in one design dinghies and small keelboats as a seven year old in Sydney's southern suburbs. A career at sea on oil tankers owned by the major companies began in 1985 with command being reached in 2001. A change of career took place with acceptance into the Port Phillip Sea Pilots which resulted in a shift of home base from Hobart to Melbourne. The past nine years has seen a re-activation of David's sailing interests with many top regatta placings in A Class Catamarans and the wider keelboat fleet as the owner of Surprise and Penfold Audi Sport, both based out of the Royal Yacht Club of Victoria in Williamstown.

Peter Little

Peter is a Barrister at the Victorian Bar and has worked and lectured in the law for close to 20 years. Peter has participated in numerous offshore races including three Melbourne to Hobart Yacht Races, one Melbourne to Vanuatu Yacht Race, two Melbourne to Launceston Yacht Races and numerous shorter ORCV offshore races. He sits on the Yachting Victoria Rules Committee and is a member of the Royal Yacht Club of Victoria and the Ocean Racing Club of Victoria. He started sailing just over fifteen years ago.

Adam Manders

After fifteen years working at sea in the Merchant Navy as a Deck Officer, Adam stepped ashore the day before his daughter was born. He currently holds the position of Ship's Manager for Toll Shipping. Adam has grown up around the sea, living and cruising on the family yacht as a child, racing dinghies in his younger years and then progressing to both inshore and offshore racing and sailing. Adam has competed in several Sydney to Hobart's, one Melbourne to Osaka and many more ocean races and regattas over the years. Adam is a member of the National Safety Committee for Yachting Australia..

Annex C**List of Interviews**

J. Table 1 below lists the people who were interviewed by members of the Inquiry Panel.

K. Given the voluntary nature of these discussions it is not intended to provide a record of these interviews.

Serial	First Name	Last Name	Role/Comment
1	Grant	Dunoon	Trybooking.com skipper. Twice, including a visit to TryBooking
2	Ross	Fisher	Trybooking.com crew
3	Kim	Walker	Trybooking.com crew
4	Peter	Fecht	Trybooking.com crew
5	Jeff	Dusting	Inception Skipper. Twice.
7	Ken	Dusting	Inception crew
8	Greg	Cameron	Inception crew
9	Doug	Abbott	Inception crew
10	Glenn	Armitstead	Inception crew
11	Justin	Brenan	Alien
12	Ashley	Trebilcock	Bandit
14	Simon	Dryden	ORCV Vice Commodore, Chair Race Committee, crew member Dry White
15	John	Rimmer	Fantasy of Man
16	Nicholas	McGuigan	Magazan 53
18	Eric	Marsh	Slinky Malinky
19	Lawrence	Ford	Spirit of Downunder
20	George	Shaw	The Secretary
21	Robin	Hewitt	Yoko
23	Don	Fraser	ORCV Commodore, skipper Dry White

24	Neville	Rose	ORCV Rear Commodore, crew Dry White
25	Craig	Longmuir	AMSA
26	Ray	Shaw	ORCV Race Director for Port Fairy Race
27	Peter	Clancy	ORCV Radio Operator
29	Bob	Tanner	ORCV Incident Response Team member
32	Russell	Lemke	Port Fairy Marine Rescue Services
33	Hugh	Parker	Port Fairy Yacht Club Commodore
34	Darryl	Cairns	Port Fairy Yacht Club Club Captain
35	Nathan	Gardiner	Acting Sergeant Victorian Water Police

Annex D**List of Yachts Competing In The 2012 Melbourne – Port Fairy Yacht Race and Their final Disposition On Completion**

Table 1 below provides details on the yachts competing in the Port Fairy Yacht Race and one boat that accompanied the race but was not an official starter. The table gives brief details of each yacht's experience, injuries, damage and disposition at the end of the Race.

Serial	Name	Skipper	Experience	Injuries and Damage
1	Alien	Justin Brenan	At about 7:45 PM on Friday, 6 April 2012 Alien was well placed inshore, when it broke its mast and retired. After clearing the decks, Alien headed for Port Fairy under motor.	Dismasted. D1 shroud attachment pulled through side wall of mast.

Serial	Name	Skipper	Experience	Injuries and Damage
2	Bandit	Ashley Trebilcock	At a time after 8 PM on Friday, 6 April 2012 when Bandit was out in front and a clear leader in many divisions and not many contenders left in the race, the skipper decided to "pull the plug" on the race as the conditions declined even further and made it extremely difficult to continue the race. Slow progress forward, 10-15 nm from finish under storm jib, with engine assistance to manoeuvre the boat. Motored the rest of the way to Port Fairy.	Helmsman injured, stanchions damaged. Lost life rings.
3	Dekadence	Ken Simpson	At 7:28 PM on Friday, 6 April 2012, Dekadence was forced to retire with broken main halyard in difficult conditions. Returned to Melbourne.	Broken main halyard.
4	Dry White	Donald Fraser	It was the only boat to finish.	Mainsail damaged, 3 injured; a fractured wrist, twisted ankle and badly bruised ribs. Bent steering wheel. Lost Jon buoy and life rings.
5	Fantasy of Man	John Rimmer	Retired 10.00am, Friday, 6 April 2012 when the winds were starting to be 25 knots West north-westerly. They retired because of a jammed jib furler. The boat was back in its pen when the storm hit. Mainsail jammed, leading to a fast trip back to Melbourne.	Sailing two handed. Jammed jib furler. Broke several equipments; mainsail traveller, windex lost, lost dan buoy and mainsail luff slides.

Serial	Name	Skipper	Experience	Injuries and Damage
6	Inception	Jeff Dusting	Inception sank early in the morning of Saturday, 7 April 2012.	Foundered.
7	Magazan 53	Nicholas McGuigan	At about 6:28 PM on Friday, 6 April 2012 Magazan retired when the skipper decided the conditions were too rough to continue and in company with The Secretary both made their way back to Melbourne.	No damage or injuries. Sheltered in Apollo Bay after retiring on their return to Melbourne.
8	Slinky Malinky	Eric Marsh	Retired and made its way to the Port Fairy River.	Sailing two handed. Blew out mainsail and # 3 jib
9	Spirit of Downunder	Lawrence Ford	At 7:50 PM on Friday, 6 April 2012 Spirit of Downunder retired with a ripped jib forcing their retirement in very strong winds. They returned to Melbourne.	Heavyweight jib damaged, sea sickness an issue.

Serial	Name	Skipper	Experience	Injuries and Damage
10	The Secretary	George Shaw	Retired at about 4:00PM on Friday, 6 April 2012 due to a hydraulic failure on the backstay. Initially they continued to Port Fairy under motor and then change their minds when wind conditions continued to decline and altered course to motor back to the heads. The Secretary was down to 3 reefs in the main and had a headsail furled when the hydraulic back stay failed. This put enormous pressure on the mast and rig. The batten cars jammed in the main track, as they were further reducing sail and they were forced to cut the main free with a knife and ditch it in a heavy sea. There was a tense moment when they struggled to release the huge flogging main which were still held by a wire outhaul until a crew member cut it free with a hacksaw.	Lost main sail. Backstay hydraulics failed.
11	Trybooking.com	Grant Dunoon	TryBooking rescued the six crew members from Inception and brought them to Port Fairy River safely.	Sea sickness and fatigue an issue.
12	Yoko	Robin Hewitt	Retired at approximately 5.30 AM on Friday, 6 April. It was back in its berth when the storm hit Melbourne.	

Annex E

Sample Checklists

- 1. Pre-sailing Crew Briefing.** The pre sailing crew brief at Appendix 1 is intended for inducting new crew members and make sure that even the old hands are all on the same page.
- 2. Pre-Sail Gear Checklist.** The pre sail gear checklist at Appendix 2 is designed to ensure everything is onboard, in its correct stowage and working:
- L. Each page of this task should be farmed out to a crewmember to run through it. Each crewman should complete a different section of the list on each occasion.
 - M. In this fashion it should be possible to guarantee the state of the boat and gear in about 30' and also familiarize crewmembers with the gear and its stowage.
 - N. This is particularly important if other crews regularly use the boat. The problem is reduced when there is one regular crew, nonetheless it is suggested that the benefits warrant the time involved.
- 3. Emergencies Brief/Checklist.** The emergencies brief/checklist is at Appendix 3. Whether a practice or the real thing it is useful to have one person run the checklist to ensure steps were not overlooked.
- 4. Securing The Boat Checklist.** A checklist used to secure the boat at the end of the sail is at Appendix 4.
- O. This checklist needs to be adapted for each boat's layout/gear.
 - P. The practice of securing all sea cocks (apart from the automatic bilge pump discharge) before securing the boat is highly recommended.
- 5. Heavy Weather Checklist.** Appendix 5 is a checklist to assist in preparing and managing the boat during heavy weather, defined for this purpose as gale force winds or greater. The RYA Sea Survival Handbook and Heavy Weather Sailing by Adlard Coles are both useful reference books on the subject.
6. These checklists should be adapted to suit the boat where necessary.

Appendices:

- 1. Pre-sailing Crew Briefing.
- 2. Pre-Sail Gear Checklist.
- 3. Emergencies Checklist.

4. Securing The Boat Checklist.
5. Heavy Weather Checklist

Appendix 1 - Pre Sail Briefing Points

Introduction

Names

Experience in sailing, this type of boat.

First Aid Competence.

Advise me of any medical problems I should be aware of afterwards.

Safety

Cruising or Racing - safety first.

Bare headed headsail changes for cruising.

Harnesses/lifejackets at night +

Harnesses lower washboard and long/short strop whenever main reefed or as conditions require.

Location of key equipments

Harnesses, wet weather gear.

Life jackets.

Fire extinguishers.

Emergency knife.

First aid kit.

Ready use sun screen and sea sick medicines.

Moving around the boat.

Gas stove, gas off when not required foul weather trousers and boots on for cooking.

Emergencies

Separate brief sheet

Navigation Plan

Destination.

Weather and expected conditions.

Watch keeping arrangements.

Victualling

List.

Snacks.

Fruit.

Muesli bars.

Biscuits/bread, jam, cheese, cold meats.

Coffee, tea, soup, poppers.

Watches

Composition:

Skipper + 1 out of watchbill -> 5 for all major evolutions
Victualler.

Priority VMG

No distractions to helmsman, relieve for food etc
Racing - seconds count, listen for the priorities

Record Keeping

Hourly Log, distance run, course made good and GPS posn:

- Sail/engine on/off.
- Major events.
- Legal document, compile carefully.
- One in each watch as the record keeper.

Food

Watch on provide hot drink/snack/meal for watch coming on
Watch going off clean up

Rounds

Check upper deck and below (including bilges) at least hourly, electric pump on auto, check if it is running.

Check battery voltage, 12v = charge

Keep the boat squared away, no loose gear, put everything back in its stowage, if you don't know where it goes ASK

Know your boat

Watch below

Sleep to windward.

Port quarter berths skipper, Stbd/watch leader.

Avoid making a racket to disturb those asleep.

Call me if in doubt, call me early, call not shake.

Clothing/Personal Gear

Warm gear required.

Beanie/balaclava.

Gloves, sox.

Thermal underwear, long johns.

Avoid cotton, wool is warm when it gets wet, synthetics best of all.

Soft waterproof bag.

2 full changes.

Face towels.

Pocket torch, knife and strobe – accessible in foul weather gear and PFD.

Do's & Don't's

Do think ahead, stay alert, question to understand, question unusual situations, check it out don't ignore it.

Do keep dry.

Do look after each other, this is a team event.
Do take anti sea sick precautions in good time if you are vulnerable
Do keep working if you are sick
Do get plenty of rest off watch, get into the watch keeping routine as soon as possible
Do maintain the defect list/lessons learnt folder.
Do know your way around the check Lists for Emergencies.

Don't leave for someone else
Don't have a heavy night out the night before, the drink and drive rule applies
Don't sleep/doze in the cockpit, if you can't stay awake sit on the windward rail

Appendix 2 - Pre Sail Check List (adapt for each yacht)

Forepeak

Sails

Jibs No 1 light & Hvy - 4 #
 Storm Sails, storm jib and trysail - check sheets attached to storm jib, strop on
 Trysail tack, luff ties on storm jib
 Spinnakers - Heavy, light, asymmetrical and masthead (4) #

Safety Gear

Life jackets + strops - 9
 Bosuns Chair, with shackle for attaching to halyard #
 Fire extinguisher #
 Heads operable, with toilet paper

 Seacocks (2) + basin discharge sea cock (1) - SHUT #
 Wooden bungs lashed to hull fittings
 Log/Echo Sounder
 Log probe clean and secure in down position, bung attached to hull fitting
 Echo sounder secured #
 Foul Weather Gear set for each crew member, strobe, mirror and whistle in
 pocket of each jacket #
 Boat Hook #
 Whisker pole #
 Cabin Lights all work?

Main Cabin

Personal Gear

Sleeping Bags for each occupied bunk + 2 spare

Personal clothing securely stowed #

Spinnaker lowering route, check for burrs around midship hatch and mast foot
#

Water

Water tanks contents by tapping, set up for one tank only

Try pump, taste it.

Anchor

2xanchors + 2 warps, 1 anchor & warp ready for use #

Warps shackled on, shackle moused and taped #

Bilges

Bilge clear from gash, free of water #

Hand bilge pump operable, handle attached by light line #

Engine sea water cooling cock open, wooden bung attached #

Sink cock open, wooden bung attached #

Galley

Food checked against list and stowed #

Matches, spare box stowed in dry spot #

Stove serviceable, test all burners #

Detergent, washing up mop, tea towels, drying cloths

Chux, gash bags, paper towelling #

Cutlery, crockery, tin opener

Adequate gas, bottle off after testing

Fire blanket in stowage, clear for use

Soups and small eats #

Tool Kit

Range of shifters, pliers #

Bolt cutters #

Engine hand starting crank

Large/medium/small screwdrivers - Phillip's and standard #

Multi grips #

Hacksaw and spare blades

Bosun's Bag

Shackles #

Snap hooks #

Bull dog grips for rigging splicing

spare headsail and main feeders

After cabin

Safety Equipment

Life raft stowed behind ladder

2 Dolphin Torches (working), 2 spare batteries

EPIRB tested and secure #

Fog horn #

First Aid Kit #

Ready Use

Main

Panic Bag stowed under Nav seat #

Waterproof portable VHF, when were the batteries charged?

8xspace blankets

8x woollen sox

Signalling mirror

Life raft heaving line+quoit

Hand torch, spare batteries

Knife, seaman's

Barley sugar

Life jackets, 1 for each crew + 1 spare (stowed under quarter berths P&S)

#

Batteries

Batteries connected, clean terminals

Securely fastened down

SG of each battery bank

Safety Gear

Ready use First Aid #

Sun screen, sea sick patches/pills, lip salve, band aids, butterfly clips, betadin

antiseptic, aspirin, panadol

Spotlight serviceable + spare bulb

Fire extinguisher #

Orange distress sheet

Signalling mirror

Emergency knife by companionway #

Emergency water

Engine #

Engine oil level, spare engine oil

Check Gear Box oil level

Fuel filter glass clear of water

Cooling water opened up, fuel opened up

Save-all free of oil and water

Set throttle and start engine

Gear

Personal gear and food stowed #
Companionway washboards stowed under quarter berth
Emergency rudder - Stbd lower after locker top with U Bolts in tool kit

Electrical Bag

Spare bulbs, chart table light, binnacle, nav lights, spot light, spreader light,
Spare torch D cell batteries
Fuses for main panel
Side cutters
Insulation tape
3m general purpose twin flex

Navigation

Charts & Publications

For area and diversions

Corrected

NTMs

Tide Tables, Almanac, List of Lights, First Aid, Flags & Signals, Collision

Regulations, AYF Rule Book (racing only)

Ship's Captain Medical Guide

Radio Weather Schedules/Coastal Radio Frequencies

Handbooks for Yacht, Engine, GPS, Instruments, Radios (2)

Sailing directions for area

Instruments

Dividers, Pencils, eraser, parallel ruler #

Sextant

Star identifier or computer

Navigation Lights

Test anchor light

Test bow and stern lights

Test steaming and fore deck light

Test battery operated emergency bow and stern lights (3)

Battery charge status (1 house battery, 2 engine battery - leave breaker at 1 house battery on)

Radios

Test VHF Ch 16, 67, 72, 73 plus race freq and HF radio 2182, 2524, 4125, 6215, 8215 plus race freq #

Sight emergency whip HF aerial

Instruments

GPS:

Switch on GPS, Check initialisation OK

Switch on sailing instruments, check echo sounder OK #

Hand bearing compass working

binoculars cleaned and serviceable #

chart table light works

Portable GPS, with spare batteries

Foredeck

Rigging

Spinnaker poles stowed, free to operate	#
Rig spinnaker and headsail sheets	#
Guardrails tight and secured	
Headsail and spinnaker halyards, spinnaker and main topping lifts cleared for use	
Stopper knot in all halyards	
Standing rigging taut, lock nuts on turnbuckles, taped to avoid sharp edges	#
Headsail sheet cars (2 per side), free for use	#
Sails	
Main rigged on boom, cover off, halyard attached	#
Cabin top jam cleats ready for use	#

Cockpit/Upper Deck

Rigging

Mainsheets lead correctly, traveller free to operate and midships, pins secured in traveller	#
Main on topping lift ready for hoisting	#
3x winch handles in pockets	#
Headsail and spinnaker sheets and braces rigged, with figure of eight knots as stoppers	#
Adjustable backstay tension minimum, stopping knot at lowest tension	#
Lines clear of the water	#
Sail ties available on binnacle	#
Halyard sheaves at foot of mast split pins in, check for snags	

Cockpit Locker

3 headsail sheets	
3 Fenders	#

Flares carried, in date, in water proof container lanyard to tie rail #

Safety Gear

Cockpit bilge pump serviceable, handle secured by strop	#
Buckets with strops in after locker	#
Cockpit drain sea cocks open, wooden bungs attached by strops	
Engine exhaust wooden bung in place	
2 life rings, Man Overboard Dan buoy stowed, clear for use, strobe on Dan buoy works, strobe on single life ring works	#
Fire extinguisher after locker	#
Short safety strop for helmsman	
Long safety strop for cockpit entry	#

Navigation

Helm free to operate #

Binnacle compass OK, check compass against distant object, check light

Emergency tiller

= checks for day sail/race

Appendix 3 - EMERGENCY PROCEDURES

Man Overboard

Priorities

Flotation Support for the man in the water.
Mark his position.
Return to the position.
Recover him.

Actions

Cockpit

Throw Stbd life ring as close to man as possible, (drill or actual)
Night time, switch on and throw a torch to him (not for a drill)
Night time or rough weather, release Jon Buoy, life ring and strobe (not for a drill)

Below

Press MOB button on chart plotter for 2"
Note GPS position, time, log reading
Prepare to start engine
When advised by cockpit no lines in the water – start engine

Follow Up Actions

If sailing recovery required, quickest reach until ready to go about then tack onto other reach to return
Lookout (height of eye (boom/crosstree - at night with dolphin torch)), listen
Rig spotlight at night – care to avoid blinding cockpit!
square search around datum,
Engine.initial leg nearest cardinal down wind, 30" legs at 6 Knots (100 yd),
add 30" each square, adjust for visibility
Sail. Wind + 225 deg, add 90 for next 3 legs
Establish contact VHF/HF with nearby ships/shore authorities
Rig MOB recovery cradle, use spinnaker halyard for lifting
heaving line, Lifesling and boat hook ready

FLOODING

Priorities

Float
- Find and stop leak(s)
- Remove water
Prepare For The Worst

Actions

Raise the alarm 'Flooding'
Tack if on the wind and there has been a collision - get hole out of the water.
Search below and topsides for damage, check skin fittings (log probe, heads, engine cooling, galley sink, cockpit drains, bilge pump outlets) or stern gland.
Stem flow using ad hoc shoring/material.
Rig hand pump in heads and start pumping
Switch on electric bilge pump
Bucket line
Establish VHF/HF comms, PAN call to advise situation
Prepare Abandon Ship gear

Abandon Ship - stick with the boat as long as possible

Priorities

Save life
Alert Authorities to situation

Actions

Secure painter and launch life raft to leeward
Assemble vital stores -
Water,
EPIRB,
Flares,
Panic bag
Warm clothing,
First aid kit
All put foul weather gear, life jackets and harnesses on
Alert Authorities and Nearby Ships
MAYDAY call on HF and VHF
Fire flare by night, smoke by day
Nice to have stores -

Foul weather gear
Food,
Portable GPS,
Portable VHF
Torches,
More clothes,
Life rings and strobes off transom
Entering raft - clip harness to life raft painter, enter as safely/dryly as possible.
Cut painter at the latest possible moment.

Appendix 4 - Securing The Boat Check Off

Bilges Sighted Dry

Fore peak, Shower sump, Main Cabin, Engine Compartment dry by pump,

Port cockpit locker dry

Sea Cocks

3x Heads and Basin - Shut

Refrigerator/Freezer

Empty unless shore power left on

Breakers

Navigation Panel breakers off

Fuse panels (2) off

Battery breaker to off (down)

Gas Bottle

Bottle off

Hatches

Forward & Midships hatch shut

Companionway locked

Appendix 5 Heavy Weather Checklist
Gale or more

Preparation – gale or greater expected within next 2-3 hrs

Secure Upper Deck

Remove unnecessary ropes such as spinnaker sheets and braces.
Check rigging arrangements for storm jib and trysail OK.
Mainsail - all reefing lines rigged, ready for use.
Jackstays rigged for safety harness tethers.
Life ring, dan buoy and life sling secured in place with easily released ties or removed to a safe/accessible place.
Life raft secure – should it be re-stowed in a safer place?
Anchor secure?
Remove deck ventilators, secure caps on openings.

Prepare Below

Leeboards rigged on bunks.
Stow everything loose, shut/tape all lockers and hatches – **will it survive a knock down/roll over?**
Buckets available.
Seasick pills anyone?
Rest the crewmembers who will bear the brunt of the work later.
Regular rounds below, ensure all gear is stowed, sea cocks not in use **SHUT**
Check bilges dry, automatic bilge pump **ON**
Make up snacks, sandwiches, thermos of soup/coffee/tea
Prepare contingency plans and alternate navigational options – where is nearest accessible shelter?

- Waypoints required entered into nav system?
- Should we divert now?

Gain sea room if required, set out minimum distances off lee shore.
Charge batteries.
Washboards fitted to companionway, tied down to avoid floating out.
Move small headsails and storm sails (stopped and fitted with own sheets) to top of the locker.
Locate parachute sea anchor, drogue and heavy warps.
Prepare parachute sea anchor for deployment if this is likely to be required (minimise the need to work on the fore deck later).
HF and VHF on.
Keep a close eye on the barometer, listen for weather forecasts/warnings.

Here it Comes!

Change down early. Beware changing back up too soon.

If Storm force winds expected go to storm jib early and consider dropping and securing the mainsail or stowing it below early.

Implement your navigation plan.

Change watch keeping routine to:

- Roster of helmsman + 'cockpit hand' clipped on up top,
- One 'cabin hand' fully dressed, ready and safely wedged in and within earshot below.
- Remainder secure in their bunks.
- Shorter watches – 2 hrs, change helmsman hourly if possible.
- Ensure skipper gets adequate rest.
- 'Cockpit hand' responsible for keeping a lookout and upper deck rounds, go to the mast every 20'.
- Cabin Hand listen out/operate radios plus:
 - Rounds below every 20' check bilges and stowage:
 - Find and if possible stop any water leaking into boat.
 - Hot drinks at watch changeovers, if possible.
 - Wear waterproof trousers and boots to operate stove.
 - Beware being thrown onto stove.
 - Change over with Cockpit Hand every hour.

Stagger watch keepers changeovers, one at a time to avoid congestion below and loss of situational awareness above.

Make a publicised decision to shift priorities - stop racing and focussing on preserving the boat and crew.

Clip on before going up top.

Use short tethers to avoid being thrown around and injured

Advice on preparing for and handling heavy weather is available in the RYA Sea Survival Handbook and book Adlard Coles' Heavy Weather Sailing by Peter Bruce, 6th Edition, London, 2008.

Annex F

Possible Flooding Sequence

Introduction

1. This is a suggested reconstruction based on accounts from Inception's Skipper and crew. The possible flooding sequence is knowledgeable supposition, not facts – we don't know with certainty what occurred.

Relevant Layout Details

SEACOCK AND SKIN FITTING LAY OUT

BENETEAU 50

3 CABIN AND 4 CABIN VERSIONS

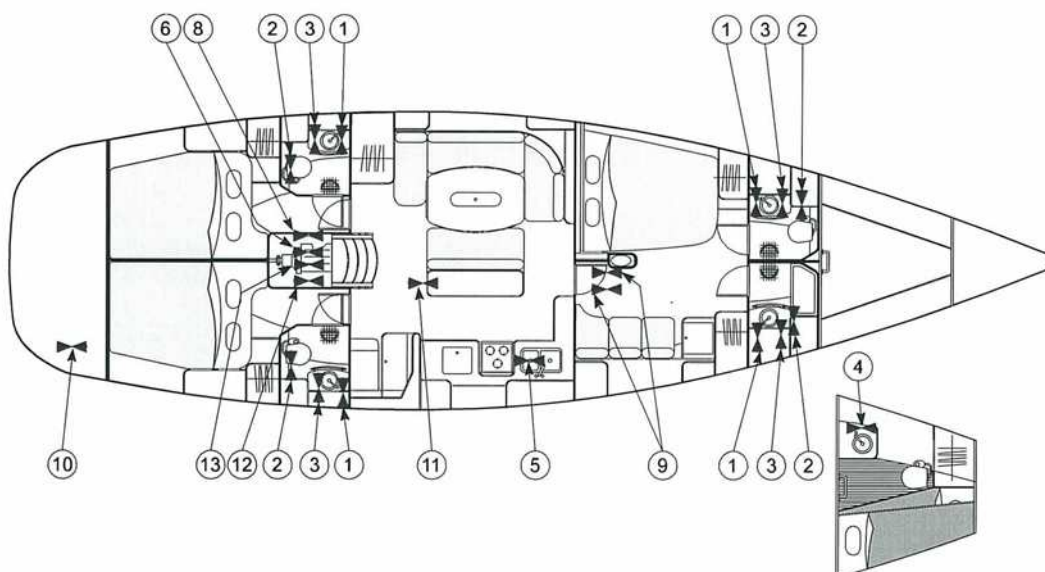


Figure 1 – Sea Cock Layout diagram from Beneteau Owner's Handbook

2. The sea cock diagram in the Beneteau Owner's Handbook has omitted the sea cocks associated with a head and a sink in the 'Skipper's Cabin' forward:

- These cocks were kept closed as the 'cabin' was rarely used as accommodation.
- They were in a vulnerable position as they were a tempting step for someone coming down the ladder into this compartment.
- Since a crewman entered the compartment to stow the NO 1 jib on 6Apr12 it is possible that he could have inadvertently stepped on and opened a seacock.
- This was a small compartment, a 5' 10" person standing on the cabin sole could reach up and shut the hatch.
- The bunks were approximately 5' 10". (there were no bunk cushions installed for this race).
- There was bow thruster built in at construction, fitted at the forward end of the 'Skipper's cabin'.
 - This was an athwartships tunnel, with the motor and impellers fitted at right angles, forming a T, with the motor aligned fore and aft and projecting aft.
 - The installation had been modified by fitting a large gel battery on the starboard side below the lower bunk to improve voltage and hence thruster performance.
 - This was secured in chocks with two, 2-part webbing strap over the top, tensioned by a plastic webbing friction buckle.
 - It is surmised that the webbing could have come loose under repeated tensioning as the boat worked in a seaway.
 - If so, the battery was close enough to have become a battering ram and damaged the bow thruster integrity.
 - The inquiry heard an anecdotal account of another yacht suffering from flooding when the unsupported bow thruster motor worked in a seaway, inducing a fatigue failure in the casing leading to flooding.
 - Water coming in through a damaged bow thruster would have been fairly confined to the 'skipper's cabin', as it could only pass into the boat via the limber holes in the bulkhead, which was otherwise fairly water tight - eg cable looms were dressed in with sealer.
- The deck hatch was the only entrance to the 'Skipper's cabin'.
 - It was possible that the hatch worked in the seaway and allowed water into this compartment.
 - The hatch opened forward, ie the hinges were on the aft side.
- Water in the Skipper's cabin had previously drained away, so it is assumed there were limber holes to the main bilge.
 - These had not been sighted so their existence is surmise and status unknown.

BENETEAU 50

LAY OUT OF THE BILGE PUMP SYSTEM

ANY OF THE VERSIONS

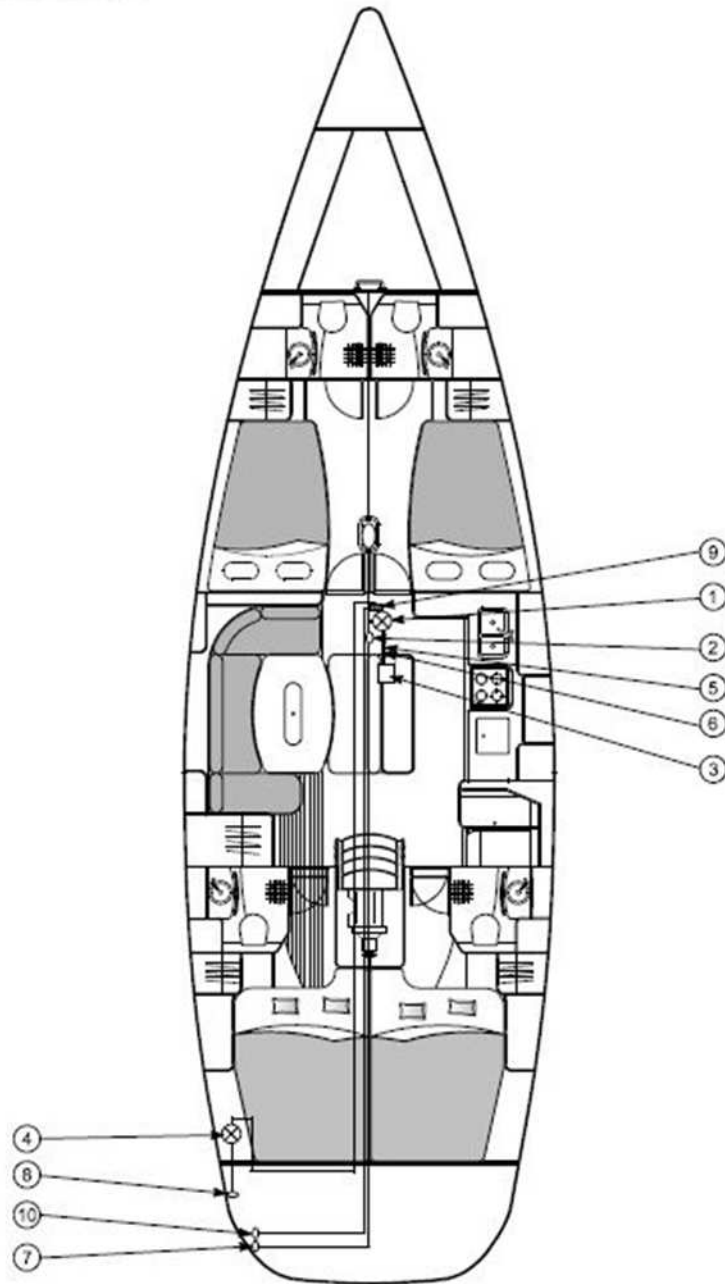


Figure 2 – Bilge Layout from Beneteau Owner's Handbook

3. The Forward cabin varied from the Beneteau Owner's Handbook as follows:

- There was only 1 head in the forward cabin; this is on the port side.
 - There is a sink and shower drain on the Starboard side.
4. The state of the associated sea cocks was not known, if the head had been used then they could well have been open, the boat did not have a strict routine about shutting unused sea cocks. The state of the sea cocks was not checked pre sailing.



Figure 3 – Photograph of Inception Showing Sea Cocks on Port Forward side

Possible Failure of A Sea Cock

5. The pipe adjacent to a sea cock had failed in the 2011 Melbourne – Port Fairy Race, the walls of the pipe were thinned, possibly by electrolysis or fatigue:
- The Skipper was unaware of the European controversy over the material used in skin fittings in some production boats.
 - The other sea cocks were not checked/changed or surveyed.
 - He may still have the remains of this seacock, it appears to be in good condition and operable.
 - The Skipper had also experienced issues with unsupported elbows attached to a seacock, ie in seawater pipe runs, rendering the pipe vulnerable to damage by force applied to the elbow.

Possible Hull Failure

6. None of the crew reported an impact of sufficient force to breach the hull.
7. The boat had incurred hull damage following a grounding at Lady Barron Island in the 2011 3 Peaks Race in Tasmania:
 - This had resulted in cracking in the hull structure at the heel of the keel.
 - This had been extensively ground out and professionally repaired by a boatyard.
 - Since the symptoms experienced were of flooding from forward these were inconsistent with a failure in the heel of the keel area, which is much further aft.

Possible Sequence of Flooding Incident

8. Given the signs noted by the crew it is most likely that the flooding resulted from a series of events, each contributing to an escalating situation. The following sequence of events leading to the loss of the boat is postulated as a reasonable construction:
9. First, the forward skipper's cabin took on water leading to the bow down attitude noted by the Skipper and helmsman:
 - Water entered via some or all of the possible sources - ie hatch, bow thruster, a skin fitting failure or an open head/sink sea cock.
 - If via the hatch some water would be held in the #1 jib and never make its way to the bilge.
 - This made the boat heavy forward, taking it down by the bow and stressing all forward hull fittings.
 - Some of this water may or may not have made its way to the main bilge via the limber holes and have been pumped overboard.
 - Flooding in the 'Skipper's Cabin' would escalate, probably continuing to fill to the new deep water line, compounding the problem.
 - There was no bilge alarm or bilge pump fitted to this compartment.
10. At this point Inception was in serious danger. Once the forward cabin was flooded the crew faced a difficult decision to overcome the situation:
 - Q. Running before the wind and seas was not an option, there was insufficient sea room; the boat was dangerously close to a hazardous lee shore.
 - R. Laying a'hull offered better control and marginally better opportunity to access the flooded cabin forward but could not be sustained for long, given the lack of sea room and posed the risk of a knock down and dismasting.
 - S. Continuing to work to windward would prevent access to the flooded cabin and aggravate the flooding.
 - T. In the event the options were never seriously considered by the fatigued and short handed crew as any chance to react to the situation was rapidly overtaken by the cascading series of failures that we posit.
11. In the second phase water probably then began to enter the forward cabin via open sink/heads sea cocks, these were now under the deeper water line caused by the flooding in the 'Skipper's Cabin':
 - The bow down trim ensured that this collected in the forward end of the cabin, taking the bow lower and increasing the flooding rate in both cabins.
 - The additional stress forward increased the possibility of a skin fitting failure(s) forward adding to this problem.

12. This led to Phase 3, a massive inflow of water via a number of entry points, principally in the forward cabin, flooding through into the main cabin:
 - In the final stages as the boat filled with water and the galley sink and after cabins sinks/heads went under the new water line, water would then start to flood in through these openings.

Timings

13. The final phase of the flooding appears to have had been very quick. Whilst the Skipper's recollection is naturally "fuzzy", we have endeavoured to reconstruct the sequence:
 - The Skipper's observation of water collecting at the forward end of the cockpit had alerted him that something was wrong.
 - He went below, checked the bilge pump sump and found it normal; there was no water in the main cabin.
 - He went back up to the cockpit and after a gap of no more than 5' minutes, went back below,
 - At this point the helmsman reported that the boat would not bear away.
 - The Skipper saw water running over the forward cabin door sill.
 - He awoke crew member sleeping below and sent a Pan call on Ch 16 and 2xHF calls, he noted the time of these calls at 2335.
 - He cut the cable ties holding the bilge pump hose in the engine bay and put this in the cabin asking a crew member to work the pump.
 - He went up on deck to organise someone to use the exterior bilge pump.
 - When he went below again the water was knee-deep.
 - He turned to send a MAYDAY on VHF and HF and noticed that the water was over the navigation table seat.
 - The helmsman used his mobile phone to speak to a friend at the Port Fairy Yacht Club and they suggested a VHF radio call to Spirit of Downunder who was said to be nearby.
 - By this time the water had risen to the Skipper's chest and it was time to abandon ship.
 - The boat appears to have sunk very close to midnight:
 - EPIRB signals registered on the satellite at 0003, the beacons were activated shortly before abandoning the boat.
 - The boat's yacht tracker did not update at midnight as scheduled.
 - The boat appeared to have gone down in approximately 20-25 minutes

Annex G

Summary of Weather Forecasts, Coastal station Observations and Wave Rider Buoy Data

1. A summary of the weather forecasts and coastal wind warnings at Appendix 1 was obtained from the Bureau of Meteorology on 20 April 2012. This has been edited to remove information for sea areas other than the area of the incident. Highlighting has been added to assist in reading the data.
2. Coastal station observations from the BOM site at Port Nelson, 70 nm West-northwest from the incident are at Appendix 2. Positioned relatively close and upwind from the incident site these provide a useful indicator of future weather at site.
3. Appendix 3 contains an extract of wave rider buoy data provided by the Department of Sustainability, Victoria. The buoy is very close to the site of the incident.

Annex G

Appendix 1
Summary of Weather Forecasts
Between 0500, Thursday, 5 April - 2200 Friday, 5 April 2012

XXXXXXXXXXXX

IDV10200
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Forecast for Victoria
Issued at 5:24 am EST on Thursday 5 April 2012
for the period until midnight EST Saturday 7 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Warning Summary at issue time
Nil.
Details of warnings are available on the Bureau's website www.bom.gov.au, by
telephone 1300-659-217* or through some TV and radio broadcasts.

Weather Situation
A ridge of high pressure will linger over the State during today as a cold
front approaches from the west. The front will move eastwards across Victoria
during Friday, introducing a cooler southwesterly flow that will persist for
the remainder of the weekend. Another cold front will move over southern
Victoria later on Sunday.

West Coast: SA-VIC Border to Cape Otway

Forecast for Thursday 5 April until midnight
Winds: Northeasterly 5 to 10 knots increasing to 10 to 15 knots tonight.
Afternoon inshore breezes to 15 knots. Seas: Below 1 metre. Swell:
Southwesterly 4 to 6 metres.

Forecast for Friday 6 April
Winds: North to northeasterly 15 to 20 knots tending north to northwesterly
during the morning then shifting westerly up to 30 knots around midday. Winds
tending west to southwesterly 30 to 40 knots by early evening. Seas: 1 to 2
metres increasing to 3 to 4 metres during the afternoon and evening. Swell:
Southwesterly 3 to 5 metres.

Forecast for Saturday 7 April

Winds: Southwesterly 20 to 30 knots decreasing to 10 to 15 knots during the afternoon. Seas: Up to 3 metres at first, decreasing to below 1 metre during the afternoon. Swell: Southwesterly 4 to 5 metres decreasing to 3 to 4 metres from midday.

The next routine forecast will be issued at 4:50 pm EST Thursday.

* Calls to 1300 numbers cost around 27.5c incl. GST, higher from mobiles or public phones.

XXXXXXXXXX

IDV20010
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 3:13 pm EST on Thursday 5 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

=====

Weather Situation

A ridge of high pressure will weaken over Victoria tonight as a cold front approaches from the west. The front will move eastwards across Bass Strait during Friday.

Gale warning for Victorian waters between SA-VIC Border and Port Campbell
Winds: Light winds then tending west to northwesterly and increasing up to 30 knots early Friday afternoon then west to southwesterly and increasing up to 35 to 40 knots later Friday afternoon. Combined sea and swell: Up to 5 metres.

Gale warning for Victorian waters between Port Campbell and Cape Schanck
Winds: Light winds then tending west to northwesterly and increasing up to 30 knots Friday evening then westerly and increasing up to 35 knots later Friday evening. Combined sea and swell: Increasing up to 5 metres.

The next warning will be issued by 11:00 pm EST Thursday.

More detailed information about local wind speed and direction and wave information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average wind speeds and highest combined sea and swell heights expected during the warning period. More detailed sea and swell information will continue to be provided within the Coastal Waters Forecast. See the Bureau's marine site at www.bom.gov.au/marine for more information.

XXXXXXXX

IDV10200
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Forecast for Victoria
Issued at 4:50 pm EST on Thursday 5 April 2012
for the period until midnight EST Sunday 8 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Warning Summary at issue time
Gale warning for Victorian waters between SA-VIC Border and Cape Schanck.
Strong wind warning for Victorian waters between Cape Schanck and 60nm east of
Gabo Island.
Details of warnings are available on the Bureau's website www.bom.gov.au, by
telephone 1300-659-217* or through some TV and radio broadcasts.

Weather Situation
A ridge of high pressure will weaken over Victoria tonight as a cold front
approaches from the west. The front will move eastwards across Bass Strait
during Friday, introducing a cooler southwesterly flow that will persist for
the remainder of the weekend. Another cold front will move across Bass Strait
later on Sunday. A strong high pressure system will move into the Bight on
Monday.

West Coast: SA-VIC Border to Cape Otway
Gale warning for Victorian waters between SA-VIC Border and Cape Schanck.

Forecast for Thursday 5 April until midnight
Winds: East to southeasterly 10 to 15 knots tending east to northeasterly in
the evening. Seas: Below 1 metre increasing to 1 to 1.5 metres later in the
evening. Swell: Southwesterly 4 to 5 metres.

Forecast for Friday 6 April
Winds: North to northeasterly 15 to 25 knots shifting west to southwesterly 30
to 40 knots in the afternoon. Seas: 1 to 2 metres increasing to 2 to 3 metres
around midday then increasing to 3 to 4 metres during the afternoon. Swell:
Southwesterly 2 to 4 metres.

Forecast for Saturday 7 April
Winds: Southwesterly 30 to 35 knots decreasing to 25 to 30 knots during the
morning then tending west to southwesterly 15 to 25 knots during the morning.
Inshore sea breezes. Seas: 2 to 3 metres decreasing to 1.5 metres around dawn.
Swell: Southwesterly 3 to 4 metres.

Forecast for Sunday 8 April

Winds: Westerly 15 to 20 knots turning southwesterly 20 to 25 knots during the afternoon. Seas: 1 to 2 metres. Swell: Southwesterly 2 to 3 metres.

The next routine forecast will be issued at 5:10 am EST Friday.

* Calls to 1300 numbers cost around 27.5c incl. GST, higher from mobiles or public phones.

XXXXXXX

IDV20010

Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 10:24 pm EST on Thursday 5 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

=====

Weather Situation

A cold front will move eastwards across Bass Strait during Friday.

Gale warning for Victorian waters between SA-VIC Border and Port Campbell
Winds: Light winds then tending northwesterly and increasing up to 30 knots Friday afternoon before shifting west to southwesterly and increasing up to 30 to 40 knots later Friday afternoon. Combined sea and swell: Up to 5 metres.

Gale warning for Victorian waters between Port Campbell and Wilsons Promontory
Winds: Light winds then tending northwesterly and increasing up to 30 knots ahead of a westerly change at 30 to 40 knots Friday afternoon and evening. Combined sea and swell: Increasing up to 5 metres.

The next warning will be issued by 5:00 am EST Friday.

More detailed information about local wind speed and direction and wave information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average wind speeds and highest combined sea and swell heights expected during the warning period. More detailed sea and swell information will continue to be provided within the Coastal Waters Forecast. See the Bureau's marine site at www.bom.gov.au/marine for more information.

XXXXX

IDV20010
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 4:16 am EST on Friday 6 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Weather Situation
A cold front will move eastwards across Bass Strait later today.

Gale warning for Victorian waters between SA-VIC Border and Port Campbell
Winds: Northerly and increasing up to 30 knots during the afternoon then
tending west to northwesterly then west to southwesterly and increasing up to
35 to 45 knots during the late afternoon and evening. Combined sea and swell:
Increasing up to 6 metres.

The next warning will be issued by 11:00 am EST Friday.

More detailed information about local wind speed and direction and wave
information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average
wind speeds and highest combined sea and swell heights expected during the
warning period. More detailed sea and swell information will continue to be
provided within the Coastal Waters Forecast. See the Bureau's marine site at
www.bom.gov.au/marine for more information.

XXXXX

IDV10200
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Forecast for Victoria
Issued at 5:40 am EST on Friday 6 April 2012
for the period until midnight EST Sunday 8 April 2012.

=====

Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Warning Summary at issue time

Gale warning for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Details of warnings are available on the Bureau's website www.bom.gov.au, by telephone 1300-659-217* or through some TV and radio broadcasts.

Weather Situation

A cold front will move eastwards across Victoria during Friday, introducing a cooler southwesterly flow that will persist for the remainder of the weekend. Another cold front will move over southern Victoria later on Sunday. A strong high pressure system will move into the Bight on Monday.

West Coast: SA-VIC Border to Cape Otway

Gale warning for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Forecast for Friday 6 April until midnight

Winds: Northerly 15 to 20 knots increasing to 20 to 25 knots during the morning then tending west to northwesterly 20 to 30 knots around midday. Winds tending west to southwesterly 35 to 45 knots during the afternoon. Seas: 1 to 2 metres increasing to 2 to 3 metres around midday then increasing to 3 to 5 metres during the afternoon. Swell: Southwesterly 4 to 5 metres decreasing to 3 to 4 metres from midday.

Forecast for Saturday 7 April

Winds: Southwesterly 30 to 35 knots decreasing to 25 to 30 knots during the morning then tending west to southwesterly 15 to 25 knots during the morning. Inshore sea breezes. Seas: 2 to 3 metres decreasing to 1.5 metres around dawn. Swell: Southwesterly 3 to 4 metres.

Forecast for Sunday 8 April

Winds: Westerly 15 to 20 knots turning southwesterly 20 to 25 knots during the afternoon. Seas: 1 to 2 metres. Swell: Southwesterly 2 to 3 metres.

The next routine forecast will be issued at 4:50 pm EST Friday.

* Calls to 1300 numbers cost around 27.5c incl. GST, higher from mobiles or public phones.

XXXXX

IDV20010

Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning

for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 10:43 am EST on Friday 6 April 2012.

=====

Please be aware

Wind gusts can be 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

=====

Weather Situation

A cold front will move eastwards across Bass Strait later today.

Gale warning for Victorian waters between SA-VIC Border and Port Campbell
Winds: Northerly up to 30 knots then tending west to northwesterly then west to southwesterly and increasing up to 35 to 40 knots during the late afternoon and evening. Combined sea and swell: Increasing up to 6 metres.

The next warning will be issued by 5:00 pm EST Friday.

More detailed information about local wind speed and direction and wave information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average wind speeds and highest combined sea and swell heights expected during the warning period. More detailed sea and swell information will continue to be provided within the Coastal Waters Forecast. See the Bureau's marine site at www.bom.gov.au/marine for more information.

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IDV20010

Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 3:52 pm EST on Friday 6 April 2012.

=====

Please be aware

Wind gusts can be 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

=====

Weather Situation

A cold front will move eastwards across Bass Strait today and tonight. Front at Cape Otway at 1530, expected Wilsons Promontory at 2000, Gabo Island at 2400.

Gale warning for Victorian waters between SA-VIC Border and Point Lonsdale
Winds: West to southwesterly increasing to 35 to 40 knots. Combined sea and swell: Increasing up to 6 metres.

The next warning will be issued by 11:00 pm EST Friday.

More detailed information about local wind speed and direction and wave information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average wind speeds and highest combined sea and swell heights expected during the warning period. More detailed sea and swell information will continue to be provided within the Coastal Waters Forecast. See the Bureau's marine site at www.bom.gov.au/marine for more information.

XXXX

IDV20010
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 4:24 pm EST on Friday 6 April 2012.

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Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

=====

Weather Situation

A cold front will move eastwards across Bass Strait today and tonight. Front at Cape Otway at 1530, expected Wilsons Promontory at 2000, Gabo Island at 2400.

Gale warning for Victorian waters between SA-VIC Border and Wilsons Promontory
Winds: West to southwesterly increasing up to 35 to 40 knots this evening.
Combined sea and swell: Increasing up to 6 metres.

Winds: North to northeasterly 20 to 30 knots shifting west to southwesterly and increasing up to 35 knots this evening and at night. Combined sea and swell: Up to 4 metres.

The next warning will be issued by 11:00 pm EST Friday.

More detailed information about local wind speed and direction and wave information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average wind speeds and highest combined sea and swell heights expected during the warning period. More detailed sea and swell information will continue to be provided within the Coastal Waters Forecast. See the Bureau's marine site at www.bom.gov.au/marine for more information.

XXXX

IDV10200
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Forecast for Victoria
Issued at 4:50 pm EST on Friday 6 April 2012
for the period until midnight EST Monday 9 April 2012.

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Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Warning Summary at issue time
Gale warning for Victorian waters between SA-VIC Border and 60nm east of Gabo
Island.
Details of warnings are available on the Bureau's website www.bom.gov.au, by
telephone 1300-659-217* or through some TV and radio broadcasts.

Weather Situation

A cold front will move across eastern Bass Strait tonight, introducing a cooler
southwesterly flow that will persist for the remainder of the weekend. Another
cold front will move across Bass Strait later on Sunday. A strong high pressure
system will move into the Bight on Monday and move towards western Bass Strait
on Tuesday.

West Coast: SA-VIC Border to Cape Otway
Gale warning for Victorian waters between SA-VIC Border and 60nm east of Gabo
Island.

Forecast for Friday 6 April until midnight
Winds: West to southwesterly 30 to 40 knots becoming southwesterly 25 to 30
knots later in the evening. Seas: 3 to 4 metres. Swell: Westerly 3 to 4 metres
tending southwesterly 4 to 5 metres late this evening.

Forecast for Saturday 7 April
Winds: Southwesterly 25 to 30 knots turning westerly 15 to 20 knots in the
morning. Seas: 2 to 3 metres decreasing to 1.5 metres around dawn. Swell:
Southwesterly 4 to 5 metres decreasing to 3 to 4 metres from midday.

Forecast for Sunday 8 April
Winds: Westerly 15 to 20 knots turning southwesterly 20 to 25 knots during the
afternoon. Seas: 1 to 2 metres. Swell: Southwesterly 3 metres.

Forecast for Monday 9 April
Winds: Southwesterly 20 to 30 knots tending southerly 20 to 25 knots during the
afternoon then decreasing to 15 to 20 knots during the evening. Seas: Up to 3
metres decreasing to 2 metres during the evening. Swell: Southwesterly 3 to 4
metres.

The next routine forecast will be issued at 5:10 am EST Saturday.

* Calls to 1300 numbers cost around 27.5c incl. GST, higher from mobiles or public phones.

XXXX

IDV20010
Australian Government Bureau of Meteorology
Victoria

Coastal Waters Wind Warning
for Victorian waters between SA-VIC Border and 60nm east of Gabo Island.

Issued at 9:43 pm EST on Friday 6 April 2012.

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Please be aware
Wind gusts can be 40 percent stronger than the averages given here, and maximum
waves may be up to twice the height.

=====

Weather Situation

A cold front near Seaspray at 2130hrs is expected near Gabo Island at 0100hrs
Saturday.

Gale warning for Victorian waters between SA-VIC Border and 60nm east of Gabo
Island

Winds: North to northwesterly 20 to 30 knots ahead of the front. Wind shifting
west to southwesterly 35 to 45 knots following the front then gradually easing
from the west during Saturday. Combined sea and swell: Up to 6 metres.

The next warning will be issued by 5:00 am EST Saturday.

More detailed information about local wind speed and direction and wave
information is available in the Coastal Waters Forecast.

Please note: coastal wind warnings now contain details of the highest average
wind speeds and highest combined sea and swell heights expected during the
warning period. More detailed sea and swell information will continue to be
provided within the Coastal Waters Forecast. See the Bureau's marine site at
www.bom.gov.au/marine for more information.

Appendix 2 - Observations from Cape Nelson

Information is extracted from BOM records.

All entries show:

Station: 90184,

Year: 2012

Month: 4,

MI format in local standard time: 0.

Count of average wind speed observations in last 60 minutes: 60

Quality of Highest maximum 3 sec wind gust in last 60 minutes: Y

DD	HH24	Average wind speed in last 60 minutes in km/h where observations count >= 24	Quality of average wind speed in last 60 minutes	Highest maximum 3 sec wind gust in last 60 minutes in km/h where observations count >= 24	Count of Highest maximum 3 sec wind gust observations in last 60 minutes	Average direction of wind in last 60 minutes in degrees true where observations count >= 24	Quality of average direction of wind in last 60 minutes	Count of average direction of wind observations in last 60 minutes
6	0				0			0
6	1	22	Y	31	60	34	Y	60
6	2	21	Y	30	60	23	Y	60
6	3	25	Y	39	60	5	Y	60
6	4	28	Y	46	60	2	Y	60
6	5	30	Y	46	60	2	Y	60
6	6	31	Y	48	60	2	Y	60
6	7	34	Y	52	60	2	Y	60

ORCV Internal Inquiry into the Loss of the Yacht Inception – 2012

DD	HH24	Average wind speed in last 60 minutes in km/h where observations count >= 24	Quality of average wind speed in last 60 minutes	Highest maximum 3 sec wind gust in last 60 minutes in km/h where observations count >= 24	Count of Highest maximum 3 sec wind gust observations in last 60 minutes	Average direction of wind in last 60 minutes in degrees true where observations count >= 24	Quality of average direction of wind in last 60 minutes	Count of average direction of wind observations in last 60 minutes
6	8	34	Y	50	60	6	Y	60
6	9	32	Y	52	60	6	Y	60
6	10	33	Y	61	60	0	Y	60
6	11	36	Y	59	60	353	Y	60
6	12	32	Y	52	60	335	Y	60
6	13	32	Y	54	60	299	Y	60
6	14	43	Y	70	60	300	Y	60
6	15	47	Y	72	60	300	Y	60
6	16	40	Y	68	60	308	Y	60
6	17	52	S	94	60	312	Y	60
6	18	60	Y	93	60	286	Y	60
6	19	70	S	105	60	268	Y	60
6	20	69	S	100	60	269	Y	60
6	21	51	Y	83	60	283	Y	60
6	22	33	Y	68	60	326	Y	60
6	23	28	Y	68	60	353	Y	60
7	0	29	Y	61	60	320	Y	60
7	1	24	Y	50	60	27	Y	60
7	2	23	Y	44	60	26	Y	60
7	3	22	Y	41	60	43	Y	60
7	4	22	Y	42	60	36	Y	60
7	5	20	Y	37	60	38	Y	60

ORCV Internal Inquiry into the Loss of the Yacht Inception – 2012

DD	HH24	Average wind speed in last 60 minutes in km/h where observations count >= 24	Quality of average wind speed in last 60 minutes	Highest maximum 3 sec wind gust in last 60 minutes in km/h where observations count >= 24	Count of Highest maximum 3 sec wind gust observations in last 60 minutes	Average direction of wind in last 60 minutes in degrees true where observations count >= 24	Quality of average direction of wind in last 60 minutes	Count of average direction of wind observations in last 60 minutes
7	6	20	Y	42	60	83	Y	60
7	7	19	Y	39	60	71	Y	60
7	8	17	Y	39	60	77	Y	60
7	9	16	Y	31	60	54	Y	60
7	10	14	Y	31	60	30	Y	60
7	11	18	Y	37	60	310	Y	60
7	12	21	Y	39	60	271	Y	60
7	13	19	Y	30	60	268	Y	60
7	14	18	Y	30	60	279	Y	60
7	15	20	Y	37	60	291	Y	60
7	16	21	Y	37	60	283	Y	60
7	17	20	Y	42	60	275	Y	60
7	18	21	Y	39	60	280	Y	60
7	19	23	Y	41	60	281	Y	60
7	20	22	Y	50	60	289	Y	60
7	21	18	Y	41	60	273	Y	60
7	22	19	Y	30	60	272	Y	60
7	23	14	Y	24	60	329	Y	60

Annex G

Appendix 3 - Wave Rider Buoy Data From Port Campbell

1. Table 1 contains an extract of wave rider buoy data provided by the Department of Sustainability, Victoria. The buoy is very close to the site of the incident.
2. Highlighting has been added to assist in reading the area of interest.

Wave riding Buoy Data Provided By Sustainability Victoria for The Buoy off Port Campbell

The measurements in the chart displayed below provide the following information:

1. Significant wave height: measured in metres and representing the average height of the highest one third of the waves in the record.
2. Maximum wave height: the maximum height of waves in the record (in metres).
3. Average wave period: the average time (in seconds) between all waves in the record.
4. Peak wave period: the peak energy period (in seconds) of the dominant waves in the record.
5. Average Wave direction: the direction from which the average of waves are travelling at the peak energy period (in degrees from magnetic north).
6. Peak Wave direction: the direction from which the peak waves are travelling at the peak energy period (in degrees from magnetic north).

Time (AEST)	Signifi cant Wave Height (Hsig) m	Maximu m Wave Height (Hmax) m	Zero Crossing Period (Tz) s	Peak Wave Period (Tp) s	Average Magnetic Wave Direction deg	Peak Magnetic Wave Direction deg
6/04/12 0:00	3.93	6.45	11.76	15.22	226.14	226.79
6/04/12 0:10	3.72	5.39	11.34	17.57	226.14	226.79
6/04/12 0:20	4.01	5.86	11.54	17.8	226.14	226.79
6/04/12 0:30	4.24	6.81	12.22	17.53	225.59	223.43
6/04/12 0:40	4.15	6.81	12.09	17.54	225.59	223.43
6/04/12 0:50	4.06	6.38	11.61	17.28	225.59	223.43
6/04/12 1:00	4.08	6.38	11.26	17.35	227.53	227.53
6/04/12 1:10	3.91	6.09	11.23	15.97	227.53	227.53
6/04/12 1:20	4.2	7.59	12.34	16.12	227.53	227.53
6/04/12 1:30	4.05	7.59	11.64	16.15	226.5	227.39
6/04/12 1:40	3.92	7.59	11.57	17.55	226.5	227.39
6/04/12 1:50	4.08	7.79	11.56	15.3	226.5	227.39
6/04/12 2:00	4.16	7.79	11.78	15.23	226.38	226.74
6/04/12 2:10	4.12	7.79	11.27	15.23	226.38	226.74
6/04/12 2:20	3.86	6.02	11.38	17.3	226.38	226.74
6/04/12 2:30	3.86	6.02	11.43	17.27	226.93	228.51
6/04/12 2:40	3.82	5.82	11.56	16.1	226.93	228.51
6/04/12 2:50	3.96	7.05	11.22	16.3	226.93	228.51
6/04/12 3:00	3.75	7.05	10.57	16.11	227.05	226.73
6/04/12 3:10	3.65	7.05	10.41	16.16	227.05	226.73
6/04/12 3:20	3.41	6.22	10.85	16.31	227.05	226.73
6/04/12 3:30	3.12	4.6	10.71	16.5	226.71	226.2
6/04/12 3:40	3.52	6.79	11.34	17.03	226.71	226.2
6/04/12 3:50	3.7	6.79	11.02	16.31	226.71	226.2
6/04/12 4:00	3.86	6.79	11.21	16.96	224.65	225.36
6/04/12 4:10	3.7	5.76	11.23	16.09	224.65	225.36
6/04/12 4:20	3.51	5.3	11.01	16.35	224.65	225.36
6/04/12 4:30	3.61	5.63	11.18	16.31	224.15	224.71
6/04/12 4:40	3.19	5.63	10.78	16.04	224.15	224.71
6/04/12 4:50	3	5.63	10.74	17.26	224.15	224.71
6/04/12 5:00	2.88	5.01	10.64	17.43	224.24	227.01
6/04/12 5:10	2.98	5.4	10.28	17.39	224.24	227.01
6/04/12 5:20	3.16	5.4	10.57	17.24	224.24	227.01
6/04/12 5:30	3.31	5.43	10.82	17.04	224.17	218.57
6/04/12 5:40	3.29	5.43	10.58	17.28	224.17	218.57
6/04/12 5:50	3.04	4.79	10.62	17.39	224.17	218.57
6/04/12 6:00	3.04	4.79	9.99	17.5	223.06	222.83
6/04/12 6:10	3.14	4.43	10.51	17.06	223.06	222.83
6/04/12 6:20	3.25	5.12	10.11	17.25	223.06	222.83
6/04/12 6:30	3.25	5.12	10.29	16.06	225.96	224.46

Time (AEST)	Signifi cant Wave Height (Hsig) m	Maximu m Wave Height (Hmax) m	Zero Crossing Period (Tz) s	Peak Wave Period (Tp) s	Average Magnetic Wave Direction deg	Peak Magnetic Wave Direction deg
6/04/12 6:40	3.51	5.12	10.71	17.02	225.96	224.46
6/04/12 6:50	3.43	4.59	11.22	16.62	225.96	224.46
6/04/12 7:00	3.26	4.89	10.83	16.83	226.95	227.09
6/04/12 7:10	3.16	4.91	10.04	16.18	226.95	227.09
6/04/12 7:20	3.28	5.49	9.99	16.2	226.95	227.09
6/04/12 7:30	3.4	5.49	9.96	15.81	227.91	227.99
6/04/12 7:40	3.34	5.44	10.18	15.91	227.91	227.99
6/04/12 7:50	3.24	5.37	10.42	16	227.91	227.99
6/04/12 8:00	3.06	4.77	9.87	17.22	225.46	223.22
6/04/12 8:10	2.93	4.77	9.28	14.81	225.46	223.22
6/04/12 8:20	3.18	5.11	9.37	14.79	225.46	223.22
6/04/12 8:30	3.28	5.11	9.86	17.45	225.87	226.2
6/04/12 8:40	3.12	5.11	9.74	17.28	225.87	226.2
6/04/12 8:50	3.03	5.17	9.56	16.59	225.87	226.2
6/04/12 9:00	3.03	5.17	9.7	17.22	226.04	220.33
6/04/12 9:10	3.03	5.17	10.26	17.42	226.04	220.33
6/04/12 9:20	2.97	4.82	10.49	17.42	226.04	220.33
6/04/12 9:30	3.08	4.82	10.61	16.76	226.4	222.82
6/04/12 9:40	3.1	4.95	10.01	15.95	226.4	222.82
6/04/12 9:50	3.01	4.95	9.43	15.92	226.4	222.82
6/04/12 10:00	2.79	4.81	9.26	13.89	227.14	226.57
6/04/12 10:10	2.77	4.37	9.25	14.07	227.14	226.57
6/04/12 10:20	2.85	4.61	9.52	14.82	227.14	226.57
6/04/12 10:30	3.02	5.42	9.71	16.89	225.08	223.15
6/04/12 10:40	3.15	5.42	9.75	16.27	225.08	223.15
6/04/12 10:50	3.13	5.33	9.9	16.58	225.08	223.15
6/04/12 11:00	3.53	5.55	10.45	16.43	227.75	225.57
6/04/12 11:10	3.15	5.55	9.97	16.14	227.75	225.57
6/04/12 11:20	3.03	5.19	9.74	15.83	227.75	225.57
6/04/12 11:30	3.18	5.01	10.06	16.01	227.44	226.43
6/04/12 11:40	3.42	5.01	10.69	17.13	227.44	226.43
6/04/12 11:50	3.28	5.01	10.02	17.21	227.44	226.43
6/04/12 12:30	2.87	4.33	9.47	15.97	225.27	223.15
6/04/12 12:40	3.01	5.07	9.53	16.87	225.27	223.15
6/04/12 12:50	2.91	5.07	9.5	17.28	225.27	223.15
6/04/12 13:00	2.88	5.08	9.1	16.47	226.14	222.73
6/04/12 13:10	2.79	5.08	9.13	16.29	226.14	222.73
6/04/12 13:20	2.94	5.21	9.12	16.37	226.14	222.73
6/04/12 13:30	3	5.21	9.3	16.92	226.34	223.2
6/04/12 13:40	2.89	4.86	9.53	16.33	226.34	223.2
6/04/12 13:50	2.66	3.96	8.88	16.08	226.34	223.2

Time (AEST)	Signifi cant Wave Height (Hsig) m	Maximu m Wave Height (Hmax) m	Zero Crossing Period (Tz) s	Peak Wave Period (Tp) s	Average Magnetic Wave Direction deg	Peak Magnetic Wave Direction deg
6/04/12 14:00	2.64	5.24	8.7	13.83	227.95	224.38
6/04/12 14:10	2.56	5.24	8.16	16.05	227.95	224.38
6/04/12 14:20	2.68	4.31	8.58	15.99	227.95	224.38
6/04/12 14:30	2.76	4.31	8.53	14.97	226.15	220.65
6/04/12 14:40	3.02	4.31	9.42	14.89	226.15	220.65
6/04/12 14:50	3.01	4.78	9.3	15.08	226.15	220.65
6/04/12 15:00	3.34	5.16	9.38	15.55	226.91	222.99
6/04/12 15:10	3.26	5.16	9.13	14.91	226.91	222.99
6/04/12 15:20	3.22	5.16	9.11	14.91	226.91	222.99
6/04/12 15:40	3.03	4.36	9.13	15.74	226.91	220.81
6/04/12 15:50	3.02	4.36	8.71	13.78	226.91	220.81
6/04/12 16:00	3.21	4.98	8.79	14.67	224.71	220.17
6/04/12 16:10	3.01	4.98	7.91	14.6	224.71	220.17
6/04/12 16:50	2.91	4.83	7.66	12.34	226.75	217.78
6/04/12 17:00	2.83	5.35	7.77	14.75	229.51	225.01
6/04/12 17:10	2.9	5.35	7.88	15.01	229.51	225.01
6/04/12 17:20	3.01	5.53	7.86	14.27	229.51	225.01
6/04/12 17:30	2.91	5.53	7.59	13.2	229.84	224.12
6/04/12 17:40	3.11	5.53	7.86	13.75	229.84	224.12
6/04/12 17:50	3.27	6.95	7.54	13.82	229.84	224.12
6/04/12 18:00	3.52	6.95	7.73	13.85	226.84	219.53
6/04/12 18:10	3.45	6.95	7.47	14.78	226.84	219.53
6/04/12 18:20	3.43	6.08	7.44	14.71	226.84	219.53
6/04/12 18:30	3.53	6.48	7.44	13.94	231.09	219.39
6/04/12 18:40	3.61	6.48	7.57	13.86	231.09	219.39
6/04/12 18:50	3.7	6.48	7.39	13.83	231.09	219.39
6/04/12 19:00	3.6	6.32	6.83	15.67	237.91	223.09
6/04/12 19:10	3.71	6.32	6.89	15.89	237.91	223.09
6/04/12 19:20	3.89	6	6.9	7.05	237.91	223.09
6/04/12 19:30	4.2	6.19	7.27	15.93	238.7	223.04
6/04/12 19:40	4.32	6.49	7.12	15.86	238.7	223.04
6/04/12 19:50	4.3	6.49	7.1	13.01	238.7	223.04
6/04/12 20:10	4.67	7.97	7.47	8.58	239.74	225.32
6/04/12 20:20	5.01	8.49	7.85	8.74	239.74	225.32
6/04/12 20:30	5.09	8.49	7.78	8.77	239.74	225.32
6/04/12 20:40	5.22	8.49	7.87	8.64	239.14	223.98
6/04/12 20:50	5.16	8.65	7.64	8.72	239.14	223.98
6/04/12 21:00	5.22	8.65	7.63	9.76	242.08	245.8
6/04/12 21:10	5.15	10.38	7.76	9.74	242.08	245.8
6/04/12 21:20	5.26	10.38	8.09	9.57	242.08	245.8
6/04/12 21:30	5.64	10.38	8.07	9.45	242.08	245.8

Time (AEST)	Signifi cant Wave Height (Hsig) m	Maximu m Wave Height (Hmax) m	Zero Crossing Period (Tz) s	Peak Wave Period (Tp) s	Average Magnetic Wave Direction deg	Peak Magnetic Wave Direction deg
6/04/12 21:40	5.78	9.26	8.1	9.34	240.43	244.26
6/04/12 21:50	5.72	8.95	8.05	9.35	240.43	244.26
6/04/12 22:00	5.39	8.95	7.93	9.4	238.03	232.34
6/04/12 22:10	5.33	8.23	8.15	9.9	238.03	232.34
6/04/12 22:20	5.47	8.23	8.42	10.18	238.03	232.34
6/04/12 22:30	5.62	8.59	8.5	10.13	237.56	240.98
6/04/12 22:40	5.78	8.59	8.46	10.1	237.56	240.98
6/04/12 22:50	5.7	8.59	8.62	9.9	237.56	240.98
6/04/12 23:00	5.57	8.08	8.28	9.67	237.56	240.98
6/04/12 23:10	5.76	9.26	8.44	9.44	233.8	233.92
6/04/12 23:20	6.07	9.26	8.58	9.38	233.8	233.92
6/04/12 23:30	6.07	9.01	8.53	10.37	233.54	229.78
6/04/12 23:40	5.61	9.01	8.22	11.45	233.54	229.78
6/04/12 23:50	5.42	9.52	7.75	11.42	233.54	229.78
7/04/12 0:00	5.31	9.52	7.82	10.8	234.99	236.26
7/04/12 0:10	5.71	10.47	8.26	10.31	234.99	236.26
7/04/12 0:20	5.78	10.47	8.39	12.15	234.99	236.26
7/04/12 0:30	6.19	10.47	8.66	10.63	234.16	233.45
7/04/12 0:40	6.06	8.52	8.49	10.76	234.16	233.45
7/04/12 0:50	5.98	10.69	8.42	10.66	234.16	233.45
7/04/12 1:00	5.79	10.69	8.33	10.77	234.16	233.45
7/04/12 1:10	5.6	10.69	8.19	9.46	230.82	229.67
7/04/12 1:20	5.41	9.33	8.23	10.84	230.82	229.67
7/04/12 1:30	5.18	8.03	8.02	10.84	228.54	227.36
7/04/12 1:40	5.23	8.03	8.36	10.87	228.54	227.36
7/04/12 1:50	5.26	9.18	8.43	11.52	228.54	227.36
7/04/12 2:00	5.32	9.18	8.26	11.83	229.74	229.73
7/04/12 2:10	5.93	9.93	8.89	11.6	229.74	229.73
7/04/12 2:20	6.04	9.93	8.91	10.29	229.74	229.73

Summary of Recommendations

Recommendations are summarised in table 1.

Serial	Recommendation	Report Reference	Responsible Authority	Remarks
	(b)	(c)	(d)	(e)
1	PLB, EPIRB and PFD instructional points for SSSC.	5.2.8, 7.5.7, 7.5.8	YA, ORCV to initiate.	
2	Avoid reliance on officers who are afloat competing in the event.	6.1.2	ORCV	
3	SSSC instructional point re recovery of survivors from the water and handling of hypothermic casualty.	6.4, 7.5.5	YA, ORCV to initiate.	
4	Training/briefing of Race Director.	6.5.5	ORCV	Initiation of alert or distress messages.
5	Include details of IMT arrangements, including capability to assist with management of NOK in advice provided to SAR authorities for each race.	6.6.2	ORCV to initiate.	
6	Additional instructions regarding the securing arrangements for life rafts. Covered in training and safety audits.	6.7	YA. Temporary requirements established by ORCV?	Current regulations encourage exposed stowage to ensure rapid launching.
7	Briefing for future Melbourne - Port Fairy Yacht Races to emphasise the exposed and dangerous nature of the coastline from Cape Otway to Port Fairy.	6.8.6	ORCV	

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8	Promulgate weather limits for starting and continuing an ORCV race. Yachts to report storm force winds to Race Director.	7.1.2	ORCV	Storm force winds the limit.
9	ORCV provide the training and equipment for the Race Director to assist SAR Authorities to coordinate a response to an incident during an ORCV race.	7.2.1, 7.2.2	ORCV	Equipment suggestions Para 9.2.2.
10	ORCV should consider additional safety measures due to the exposed situation of some races.	7.3.2	ORCV	In particular Melbourne - Port Fairy and Westcoaster.
11	Change to emphasis in the role of the Race Director, avoid single man decision making situations where possible, additional manning ORCV van and shore radio station.	7.4.1, 7.4.2	ORCV	Emphasise the safe conduct of the race as the primary focus of Race Director and van, additional personnel required to man the ORCV van. Flag Officer support for the Race Director. Assistant nominated for ORCV shore radio operator.
12	Changes to arrangements for the Incident Management Team.	7.4.4	ORCV	Nominate team leader. Mobile phone. Activation of IMT's Dr. IMT manages NOK.
13	Recognition of the people who effected the rescue.	7.5.1	ORCV	
14	Incorporate techniques developed by Inception into ORCV training	7.5.2	ORCV, YA	Drift and search planning.
15	Prepare skippers to act as a rescue vessel	7.5.4, 7.5.5	ORCV, YA	Develop/trail method for retaining survivors in the water whilst a rescue is effected.
16	Swimmer of the Watch gear	7.5.6	ORCV, YA	
17	Circulate NOK details to yachts prior to race for verification.	7.5.9	ORCV	
18	Follow up investigation of critical incident stress management measures employed.	7.6.2	ORCV	

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19	Encourage fitting AIS type B transponders	7.7.1	ORCV, YA	Also recommended by Flinders Islet inquiry
20	Adopt DSC VHF as the norm.	7.7.1, 7.7.2, 7.7.3	ORCV, YA	
21	Fit ORCV van as DSC capable VHF shore station	7.7.1, 7.7.2	ORCV	
22	Seek improvements in shore infrastructure for DSC VHF.	7.7.4	ORCV, YA	
23	Mandatory for yachts to maintain listening watch on VHF Ch 16, with dual watch on VHF race frequency where possible	7.7.5	ORCV	
24	Improvements to arrangement for the use of mobile phones.	7.7.6	ORCV	
25	Ensure availability of yacht tracker information for AMSA and Victoria Police.	7.7.7	ORCV	
26	Encourage carriage of a satellite phone by competitors	7.7.8	ORCV, YA	
27	Choice of HF frequency for initial distress call from a competitor.	7.7.9	ORCV, YA	
28	Waterproof VHF set in grab bag.	7.7.10	ORCV, YA	
29	Guidance Document negotiated between YA and SAR Authorities.	7.8.1, 7.8.2	ORCV, YA	
30	Change safety instructions and audits regarding life raft securing arrangements.	7.9.1	ORCV, YA	
31	Emphasis on watch keeping routines in training	7.10.1	ORCV, YA	
32	Training emphasis on preparations for heavy weather	7.10.2, 7.10.7, Annex E Appendix 5	ORCV, YA	
33	Use of Checklists.	7.10.3	ORCV, YA	

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34	Use of parachute anchors	7.10.4	ORCV, YA	
35	Management of Sea Cocks	7.10.5.1	ORCV, YA	
36	Use of incorrect material in sea cocks	7.10.5.2	ORCV, YA	
37	Handling a lee shore in heavy weather	7.10.6.1 - 7.10.6.4	ORCV, YA	
38	Structure of SSSC - Split into two courses	7.10.8	ORCV, YA	
39	SSSC training re Flooding	7.10.8.3	ORCV, YA	
40	SSSC training re Loss of Mast	7.10.8.3	ORCV, YA	
41	SSSC teaching point, familiarity with yacht's bilge arrangements	7.10.9.1	ORCV, YA	
42	SSSC teaching point, bilge pumping capacity	7.10.9.2	ORCV, YA	
43	SSSC teaching point, additional alarms and bilge pumping arrangements for unmanned compartments	7.10.9.3, 4.	ORCV, YA	
44	SSSC teaching point, personal gear.	7.10.10	ORCV, YA	Torches, knife, tether intermediate clip and spray hoods for PFDs.
45	SSSC teaching point, risk management mindset.	9.4	ORCV, YA	
46	Fitting of AIS SART to PLBs	7.5.8	ORCV, YA	Possible method of providing real time tracking of a survivor.
47	Consider the impact of compartments such as Inception's 'Skipper's Cabin' in assessing a yacht's suitability and stability during a safety assessment.	7.10.9.3, 7.10.9.4	ORCV, YA	Bow compartments with access from only the foredeck should be fitted with a bilge alarm to alert crew members to a developing problem and provided with an internal access hatch to ensure crew members can access the compartment regardless of the sea conditions.

Table 1 – Summary of Recommendations