



Australian Government
Australian Maritime Safety Authority

WORKING BOATS

January 2020



Innovation and resourcefulness

Harnessing potential

Leading the way
Paradigm Training Group

Automation
Where it's at

Lindsey Lankester
Determined to survive



Australian Government

Australian Maritime Safety Authority

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Message from the CEO

Harnessing innovation and resourcefulness to generate advances in maritime safety is key to AMSA's vision.

One of the challenges for all regulators, is to develop regulations that are not only effective for today's industry, but also support emerging technologies, products and markets. The rise of automation is a timely example. This edition touches on AMSA's work to support emerging autonomous and remotely controlled vessels in Australia and globally.

We also feature Paradigm Training Group on their use of technology in training and assessment to provide a flexible and supportive environment for students.

Innovation isn't always about new technology—it can be as simple as a new approach, or the resourceful use of existing assets or reserves. Mike Keyte's approach to crew induction in his Whitsunday charter operation is a great example of innovating processes to foster a safety culture.

We also cover the build, delivery and maiden voyage of three new transfer vessels commissioned to boost tourism from cruise ships passing Norfolk Island; and hear from Gordon River tour operators in Tasmania's rugged southwest.

Our incredible search and rescue story about how Lindsey Lankester survived when his boat capsized shows how natural instincts and resourcefulness can make a huge difference to the chances of survival. AMSA Medical Advisor Dr Paul Luckin corroborates this by sharing his experience as a doctor specialising in retrieval paramedicine and calculating the timeframe for survival for people in distress.

One of the key messages I have taken from the stories in this edition is that, while new technologies and other innovations will always enter the market, it is about the people and how resourcefully we select and use the tools available, including resources already at our disposal.

A handwritten signature in black ink, appearing to read 'Mick Kinley'.

Mick Kinley

Chief Executive Officer



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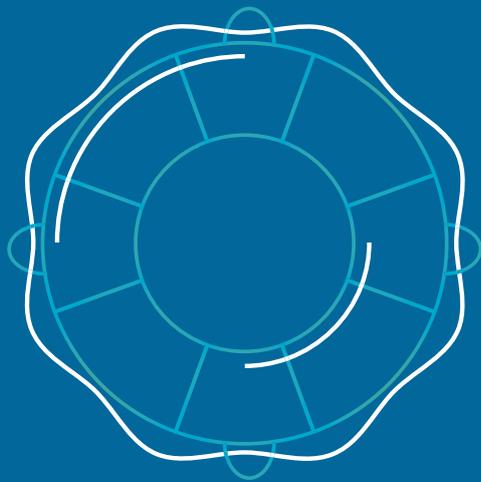
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Report maritime incidents directly to AMSA in two simple steps



1. Alert AMSA* as soon as practicable when a serious incident has occurred

Serious marine incidents include:

- death or serious injury to a person
- loss of a person overboard
- loss of, or significant damage to, a vessel.

*You can submit an incident alert by phone, email or online.

2. Submit an incident report – within 72 hours

This gives us detailed information about the incident and mitigation measures.

Form 19 – Incident report

Other types of marine incidents you need to report:

- fire
- loss of stability
- fouling of a vessel
- a close quarters situation
- any event that could impact the safety of a vessel, those on board or nearby.

Submit forms at amsa.gov.au or email completed forms to reports@amsa.gov.au



Call AMSA CONNECT **1800 627 484**



Visit amsa.gov.au/incident-reporting

Navigating the seas of disruption

In a world where emerging technologies, products and regulations cause one disruption after another, how do we keep up, let alone leverage it to our advantage? We spoke to David Platt, Director at Resilient Futures.

By Sarah Cameron

Resilient: Director of Resilient Futures, David Platt – *Image supplied*

'Disruption'—the word of the moment—refers to when something in our environment changes the way we do things, causing us to think and behave in new ways.

David Platt explained that while the scope, scale and speed of change means that we're experiencing disruption in new ways, the reality is that disruption is not a new concept.

'Throughout history, innovation has continued to disrupt and change the way we do things,' he said.

'Innovation will continue to change our world, and for many of us that means transitioning to new skills and work that aligns with the adoption of new technologies.'

In our lifetime we will see autonomous vessels become reality, but imagine what people thought when the internal combustion engine and the screw propeller disrupted the pre-existing sail technology. We have always had to come to grips with new ways of doing things. According to David the trick

Innovation will continue to change our world, and for many of us that means transitioning to new skills and work that align with the adoption of new technologies. — David Platt

is being open to it and using it to our advantage—leveraging it.

David says that for many, there is an active choice to make—either understand and embrace disruption so that it becomes a tailwind of opportunity, or ignore it and be exposed to headwinds of risk.

He added that from his experience, seafarers, who are constantly assessing conditions and changing course, are wired to strategically leverage disruption—a process also referred to as strategy in action.

'Recently, while working with folks in the commercial fishing industry, we discovered that they have a natural affinity to continuously assess immediate and emerging conditions, and the risks and opportunities associated with the conditions,' he said.

'With this information they would then focus on making the most of the circumstances by re-focusing their actions, and then continuing to trial and readjust the new approach to ensure best progress.'

'For many seafarers, this is an intuitive and obvious way to operate. The key for anyone who works on the water lies in keeping a "weather eye" to the horizon so that any actions enable a safe and successful passage,' David said.



Disrupted: Strategy for Exponential Change.
By Larry Quick and David Platt.

resilientfutures.com

[@resilientf](https://twitter.com/resilientf)

Working safely on tenders, dories or auxiliary vessels



Know the risks and stay safe

If you operate a fleet of tender vessels or work on a tender, it's important to know the hazards and risks and make sure each vessel has the right safety procedures and equipment in place to keep the crew safe.

The danger of working solo

In certain operations, tenders work at a distance from the parent vessel and at times stray from the vessel looking out for them. If you need urgent help or medical attention, you need to contact and alert your parent vessel quickly and easily.

A VHF radio is the best way for parent and tender vessels to stay in contact over longer distances.

Know where your tenders are at all times

Maintaining reliable communication between vessels is vital. If you are the master of a parent vessel it's your responsibility to monitor your tenders at all times.

A radar or Automatic Identification System (AIS) can help you keep track of each tender's location.

Every crew member must be trained and competent to operate a tender safely and know what to do if they stray from the parent vessel or get into trouble.

A simple checklist can help prevent emergency situations.

CHECKLIST

Read your safety management system

Prepare your vessel

- Do you have a maintenance plan?
- Is the vessel in good condition?

Before you go

- TELL SOMEONE where you are going and when you will return
- Check the weather forecast
- Check your safety equipment (lifejackets, communication equipment, EPIRB, flares, GPS/compass, first aid kit)
- Do you have enough food and water?
- Do you have sufficient fuel for the trip?
- Are all batteries charged?

At sea

- Is your radio on? What channel?
- Are you wearing your lifejacket?
- Check your weight. What is the maximum loading of the vessel?
- Keep to the speed limit and know where you are
- Monitor fuel use
- Do you have a schedule for checking in?



Paradigm Training Group leading the way in maritime training

Getting the right education can change lives. And getting it in an innovative, supportive and fun learning environment can dramatically improve its impact on students throughout their careers. By Peter Strachan

Innovative and flexible: Paradigm Training Group participant uses a tablet for learning on board a Paradigm vessel – Image supplied

Director of Paradigm Training Group, Rikky Burkett, has been in the education industry for 17 years, and a trainer and assessor for 14.

In 2010, with Julianne Zalite, he set up Paradigm as a group of leading training providers, enthusiastic about developing innovative quality education systems.

'I wanted to lead an organisation dedicated to changing the way education was delivered,' Rikky said.

'I wanted to ensure students had the opportunity to absorb and retain everything they needed to confidently move forward in their chosen careers.'

'To that end, we've worked closely with software company Axcelerate to develop a system using tablets to capture a student's practical competencies live. These let us observe and record tasks immediately as they happen, using video, drone technology and still photography.'

Trainers, assessors and students sign a tablet each time a student completes and a trainer observes the tasks and activities. Recordings and photographic

proof are both instantly uploaded to student records.

'We have also developed flexible programs for students seeking our maritime qualifications, using both face-to-face and online training and assessment,' Rikky explained.

'Students are always given access to as many of our workshops as they need. We encourage those who need more training or one-on-one support to come back to multiple workshops until they are confident and ready for assessment,' he said.

Paradigm now employs 12 people and trains and assesses between 200 and 300 students each year. It is one of nine companies providing maritime training in Queensland, including volunteer marine organisations, Water Police and TAFE.

As one of nine AMSA approved assessors, Paradigm is recognised for its innovative approach to education—including its development of purpose-designed software linked to cameras worn by assessors to record actual results.

'Our constant push for new innovation and the flexibility our students have on when and where they study has added to the popularity of our courses,' Rikky said.

Paradigm has recently developed a complete online AMSA-mandated practical assessment, allowing trainers to observe and record the assessment on a smart phone or tablet as it happens.

The company is also working with a Gold Coast IT organisation to develop a camera system linked to Paradigm vessels and trainers to allow recording of competencies and activities at all times, as they happen.

'We are now able to move away from paper-based resources. We expect to be paper-free by 2021,' Rikky said.

paradigmtraining.com.au

[@paradigmtraining](https://www.facebook.com/paradigmtraining)

From build to implementation: the journey of three bespoke vessels for Norfolk Island



Located 1,400 kilometres east of the Australian mainland, Norfolk Island has a unique history. Polynesian settlement, two periods as a brutal penal colony, and settlement by descendants from the mutiny on *The Bounty*, make for an exotic backdrop.

While the island has a well-established tourism industry catering to visitors arriving by air, getting to the island by sea has typically been more hazardous, particularly for passengers on cruise ships. There is no passenger ship wharves at the island and passengers wanting to land there have to be ferried to and from the cruise ships—a hit-and-miss method, depending on the weather. On many occasions, rough conditions have prevented the cruise ships from launching their boats and so—without a safe way of disembarking passengers—they simply sailed on.

To help overcome this problem and boost tourism on the island, the Australian Government Department of Infrastructure, Transport, Cities and Regional Development agreed

to upgrade the island's wharf infrastructure and build three multipurpose passenger transfer vessels.

Stored and operated at the island, the vessels now provide a reliable means for cruise ship passengers to explore this unique environment.

With the transfer vessels now successfully in operation, cruise companies are already talking about increasing the number of passengers coming ashore each visit.

As a result of the successful custom build, a well-planned delivery voyage to Norfolk Island and the implementation of an effective safety management system, the island's economy is benefiting—not just from the direct spending of these visitors—but also from the multiplier effect of repeat business.

The build process

The vessels were built by Birdon Pty Ltd in Port Macquarie on the NSW mid-north coast. According to General Manager, Peter Besseling, the vessels

were a bespoke design to cater for the specific conditions encountered on Norfolk Island.

For instance, the vessels had to be able to tie up alongside large cruise ships and transport passengers in open water. Closer to shore they also had to be able to navigate shallow waters across coral reefs, carrying up to 90 passengers, in a vessel no more than 12 metres long.

Due to the exposed Norfolk Island coastline, the vessels also had to be capable of being lifted out of the water when not in use and transported by a specially-designed trailer to a safe storage facility.

'It's quite a challenge to meet that criteria and design a vessel that is fit for purpose,' said Peter.

The solution came in the form of an aluminium twin-hulled design that uses jet propulsion instead of the usual shaft driven.. Peter said that initially, the island's operators took a bit of persuading on the design solution, partly because they were not familiar with jet propulsion.

Three passenger transfer vessels were commissioned to boost tourism from cruise ships passing Norfolk Island. We followed their production, transfer to Norfolk Island, and maiden voyage.

By Simon Enticknap



Reliable: Two passenger transfer vessels ferry passengers between a P&O cruise ship and Norfolk Island – Image supplied by Bhagwan marine

'A series of trials prior to the fabrication of the vessel ensured the operators were going to be comfortable with the propulsion units and that the vessels were going to perform as expected,' he said.

Work began on the first boat at the end of 2017, with the hull and superstructure being fabricated separately and then welded together. Being such an unusual project, the first build was the most complex, with a number of changes incorporated during construction.

Ensuring the vessels' design met all safety requirements was a key part of the build process. AMSA Accredited Marine Surveyor, Rowan Curtis from Broach Reach Marine, was engaged to carry out regular inspections during the build to ensure the finished vessels were ready to go into Class 1C survey on final testing.

In the meantime, children at the local school on Norfolk Island were asked to suggest suitable names for the three vessels, and so it was that, in July this year, *Wana* (sea urchin), *Hihi* (periwinkle), and *Nuffka* (kingfisher) were ready for final delivery.

Delivery to Norfolk Island

It was decided that the safest and most efficient way to do this was to load all the equipment onto a barge and tow it to Norfolk Island.

For this task, a specialist marine logistics company was engaged—Bhagwan Marine. Bhagwan were tasked the job of transporting the three passenger transfer vessels to the island, Bhagwan opted to use a 55-metre flat-deck dumb Barge fitted with a 110-tonne crane for lifting the vessels on and off the barge. The barge was towed from Brisbane to Port Macquarie where the vessels, trailer and cargo were loaded from the Birdon facility.

Bhagwan Marine representative for Queensland Tim Lovett, said the key to a successful delivery of this type is careful planning to manage potential risks and safety hazards in conjunction with clients' requests and objectives.

Prior to departure, extensive planning took place over the weeks leading up to departure, to ensure marine-plant suitability, stability criteria, lashing

Due to the exposed Norfolk Island coastline, the vessels also had to be capable of being lifted out of the water when not in use and transported by a specially designed trailer to a safe storage facility.



Clockwise from above: a PTV embarks toward Norfolk Island from the P&O cruise ship; the PTV's unloaded and stored at Cascade Pier; a PTV makes it's way to Norfolk Island – Images supplied by Bhagwan marine



Everything that we had planned couldn't have gone better.

— Tim Lovett

plans, AMSA and Class approvals, duration, contingency plans and of course a good weather window to complete the task.

Weather is a key factor, so long-range forecasting is crucial in ensuring a suitable 'safe' window for the ocean passage to Norfolk Island.

On arrival at the Cascade Wharf anchorage on Norfolk Island, we briefed all crew on the unloading procedure and positioned the barge with the best aspect to the weather to safely unload the vessels into the water,' Tim said.

'Everything that we had planned couldn't have gone better.'

Maiden voyage

In October, *Wana*, *Hihi* and *Nuffka* went into action for the first time. The cruise ship, *Pacific Explorer*, anchored offshore and, throughout the day, the transfer vessels were kept busy transporting passengers back and forth.

By the end of the day, more than 1800 passengers had disembarked and spent time on the island enjoying a variety of tours and activities. According to the cruise ship management, without the transfer vessels operating, the landing would have been deemed too hazardous to undertake.

Norfolk Island Administrator, Eric Hutchinson, said the inaugural operation of the transfer vessels was a tremendous success.

'The buzz around the main shopping area of the island was wonderful to

experience,' he said. 'The whole island had a wonderful feel.'

While a permanent operator for the vessels has yet to be finalised, local shipping company, Transam Argosy, was engaged to carry out the initial landing. Prior to the first landing, the operators developed their own safety management system for the operation of the vessels.

AMSA's Advisor National System, Simon Walter, visited the island to assist this process.

'I assisted them with the process of developing a safety management system—how to identify and address the operational risks,' he said.

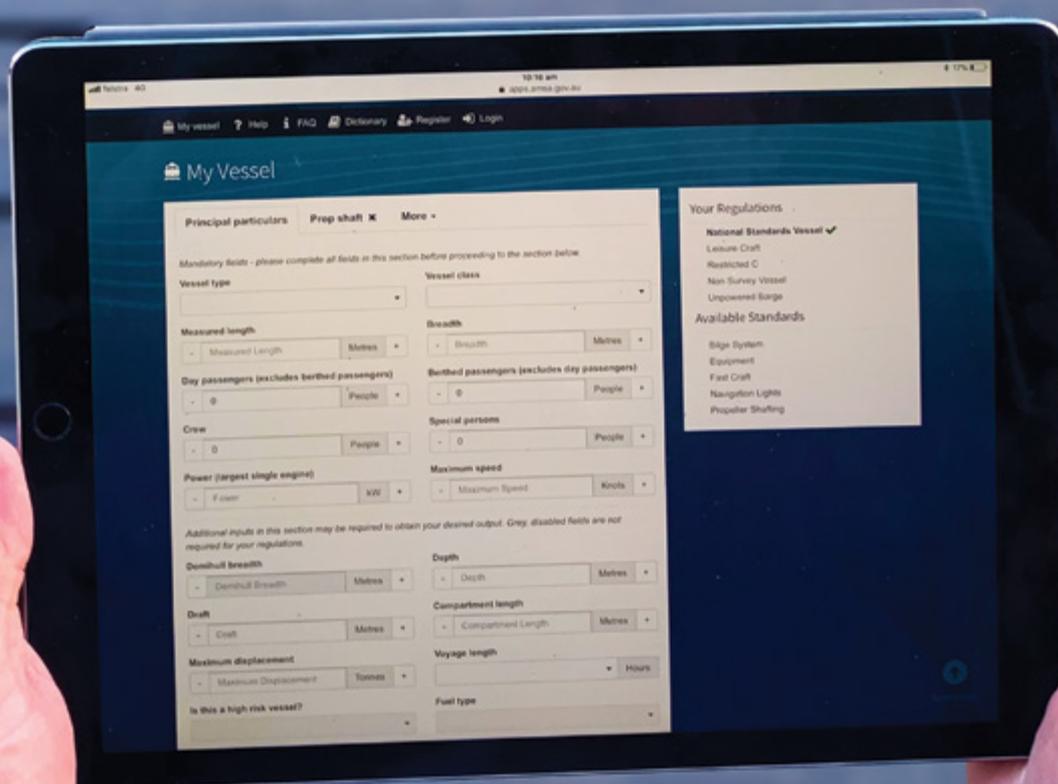
This is an example of how AMSA works with operators to identify solutions based on their particular requirements.



My Boat online system

Enter details about your boat to find out what safety requirements, legislation and standards you have to comply with.

Useful for vessel designers, builders, surveyors, owners and operators.



The image shows a person's hands holding a tablet that displays the 'My Vessel' online system. The interface is a registration form with the following sections:

- Principal particulars** (with sub-sections: Prep shaft, More)
- Mandatory fields - please complete all fields in this section before proceeding to the section below**
- Vessel type** (dropdown menu)
- Vessel class** (dropdown menu)
- Measured length** (dropdown menu: Measured Length, Metres)
- Breadth** (dropdown menu: Breadth, Metres)
- Day passengers (excludes berthed passengers)** (dropdown menu: People)
- Berthed passengers (excludes day passengers)** (dropdown menu: People)
- Crew** (dropdown menu: People)
- Special persons** (dropdown menu: People)
- Power (largest single engine)** (dropdown menu: kW)
- Maximum speed** (dropdown menu: Maximum Speed, Knots)
- Additional inputs in this section may be required to obtain your desired output. Grey disabled fields are not required for your regulations.**
- Demihull breadth** (dropdown menu: Demihull Breadth, Metres)
- Depth** (dropdown menu: Depth, Metres)
- Draft** (dropdown menu: Draft, Metres)
- Compartment length** (dropdown menu: Compartment Length, Metres)
- Maximum displacement** (dropdown menu: Maximum Displacement, Tonnes)
- Voyage length** (dropdown menu: Hours)
- Is this a high risk vessel?** (dropdown menu)
- Fuel type** (dropdown menu)

On the right side of the screen, there is a sidebar titled **Your Regulations** with the following options:

- National Standards Vessel** (checked)
- Leisure Craft
- Restricted C
- Non-Survey Vessel
- Unpowered Barge
- Available Standards**
- Stige System
- Equipment
- Fast Craft
- Navigation Lights
- Propeller Shafting



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It's easy to do.

Simply visit amsa.gov.au/myboat

Steber takes on small battery-powered ocean surface surveillance



Supportive: Alan Steber (centre) checking progress on an engine installation with engineers, Barry Brown (left) and Eddy Crees – Image supplied by Steber

The painstaking repetition and finesse of shaping two skiffs from solid timber marked the beginning of Steber International, an Australian boat building enterprise that has made innovation its byword since 1946. By Ron Aggs

Seventy three years on, large vessels—anything with the standard Steber hull shape between seven and 20 metres—have become their signature products.

While hundreds of them rock by their docks and navigate the world's waterways, the company is concurrently working on renewable lithium ion battery power, surface drones and other vessels that are part or fully crewless.

Managing Director Alan Steber's father Bruce built those two skiffs as his first commercial effort after finishing a boatbuilding apprenticeship at the end of World War II.

Evolution from solid timber to plywood, then fibreglass on timber, graduating to fibreglass alone, enabled them to develop their hull blueprint to serve individual customers' requirements.

'They come and sea-trial a boat then decide how it can be customised to suit their needs within [our] standard hull shape,' Alan said.

The company has now sold 350 large boats and refitted more than 100 for various uses, including commercial fishing, police boats, fisheries and customs patrol, marine rescue and tourism charters.

Asked about his experience working within national legislative requirements, Alan was proud of the company's record.

'We've always been able to comply with the rules and regulations on commercial boats to build innovative fit-outs to serve customer needs. We've never, ever had a failure in all our years,' Alan said.

He hopes for continuing success from research and is now scoping future opportunities.

One involves a relationship with Australian company Ocius to build their solar, wind and wave-powered, uncrewed ocean surface vessels (USVs)—surveillance drones, which sound more arresting when referred to by their commercial product name—Bluebottles.

Commercially, Bluebottles could be used for oil and gas pipeline mapping and security, and scientifically for environmental monitoring and seabed mapping.

Driverless boats for broader use? Alan thinks this can occur within five years—a realistic option for commercial fishing, for example.

'You could have a crew on board to operate the fishing equipment while the skipper could be at home controlling the boat,' Alan said.

Foolproof self-docking is a key initial test phase to demonstrate that there could be scope for safe and wide application of driverless functions.

Working with electrical engineering, mining and renewables specialists Ampcontrol, Steber is tapping into the driverless and self-docking options of currently available trains and track systems used in underground mines.

Generally he predicts a limit on driverless speed until industry and regulators are confident about safety.

After 30 years of building more than 10,000 small fibreglass runabouts from a factory in Sydney, growing competition from aluminium boats had prompted Steber's successful transition to building larger vessels.

By the mid-70s, Bruce Steber had also foreseen some of the constrictions metro manufacturers would face and moved the company to Taree on the NSW mid-north coast.

Alan completed a shipwright course then studied marine engineering and joined the Taree factory in 1976.

'There are advantages and disadvantages to decentralising but at the end of the day, we've got a pretty secure factory in a good environment.'

steber.com.au

RangerBot conducting ocean monitoring for venomous sea stars – Image supplied by Queensland University of Technology



Autonomous and remotely operated vessels

The greatest innovation emerging in the maritime sector right now is undoubtedly the emergence of autonomous and remotely operated vessels. It's a broad field, with some vessels already in use globally, including in Australia. But before this capability can be applied more widely, a large amount of international and domestic collaboration is required. Systems, technology, governance and expertise must be further developed to safely and effectively usher in this new era in maritime.

By Sarah Cameron

Of all the aspects of this developing capability, the hottest question is what automation will mean for the livelihoods of people who crew and service these vessels.

Brad Groves, General Manager of AMSA's Standards Division responsible for Australia's part in regulating these vessels, says that while seafarers will still be vitally important, roles will change.

'The safe operation of highly automated or remotely operated vessels will be dependent on seafaring experience, as well as an ability to understand and operate the systems and infrastructure

that supports the operation of these vessels,' he said.

'For example, to fly a modern aeroplane, such as an A380 or a Dreamliner, pilots must have two distinct skill sets—they must have an in-depth knowledge of the principles of flight and aviation, and also be able to understand and operate the systems and technology that support the safe flight of that aircraft. As passengers, we expect pilots to have these skills.'

While the finer details around what this will mean for seafarers is yet to be understood, the level and type of automation being developed and implemented today will certainly play a part.

We are seeing an increase in scenarios where automation and remote operation are being used ranging from a crewed vessel with some automated processes and decision support, to remotely operated vessels with or without crew, to fully autonomous vessels with no crew on board, but operators monitoring the vessel from a shore-based control centre.

So what autonomous and remotely operated vessels are in operation today and what are the challenges for regulators?

According to AMSA Principal Advisor Navigation, Grant Judson, autonomous and remotely operated vessels are already popular choices for

There is a lot of international and domestic work and collaboration underway to alter the existing policy and regulatory framework for these vessels.

— Rachel Horne

oceanography, hydrography, scientific research, the oil and gas industry and defence forces.

'Currently, these vessels are subject to the same regulatory framework as all other commercial vessels, but flexibility is often required,' he said.

'In some cases, exemptions are issued to a vessel, when the operator has indicated that the vessel can't meet specific survey or crewing requirements, but there are other controls in place that effectively ensure it poses no risk to the safety of people, other vessels and the environment.'

One of the common scenarios AMSA sees is where small autonomous or remotely operated vessels are operated as equipment directly off a foreign vessel or regulated Australian vessel. AMSA generally treats these small vessels as 'ship's equipment', which means they are considered to be part of the mothership for the purposes of survey. Ship's equipment is included and operated in compliance with the ship's safety management system.

'This principle has been common practice in the offshore oil and gas industry for many years,' Grant said.

However, standalone vessels that operate independently are a far more complex issue and is something that AMSA is working on.

'Like our knowledge of the emerging technology that enables autonomous vessels, our regulatory approach is still in its formative stages,' said Rachel Horne, AMSA Senior Advisor Maritime Regulation.

'There is a lot of international and domestic work and collaboration underway to alter the existing policy and regulatory framework for these vessels, to better accommodate and facilitate emerging technology, while maintaining the safety of people, the vessels, and the environment they move through,' she said.

Internationally, AMSA influences the regulation of the systems and technology that will support global shipping of the future, through our work at the International Maritime Organization. Our role is to ensure that the systems and infrastructure that support highly automated ships are safe and effective when operated in Australian waters.

Meanwhile, AMSA is applying regulatory treatments for commercial vessels in Australia based on the risks presented, including considerations such as vessel size, area and concept of operational use, the ability to comply with collision regulations, environmental impacts and differing levels of autonomy.

In early 2020, we will commence further engagement with our stakeholders in this emerging field.



DriX USV Remotely operated vehicle using autonomous docking underwater technology – iXblue and Forssea



Remus 6000 AUV engaged in marine defence hydrographic research – Hydroid Kongsberg



SeaWorker USV autonomous surface vessel conducting surveillance of the ocean floor – Ocean Infinity



Bluebottle unmanned data gathering and communication – Ocious Technology Ltd

What are your chances?

When it comes to survival, AMSA Medical Advisor Dr Paul Luckin has seen it all. His long career as medical doctor in search and rescue (SAR), and his in-depth understanding of the human psyche has made him a leading expert in calculating the timeframe for survival (TFFS) for people in life-threatening situations. He spoke to AMSA about resourcefulness—as the survivor and the rescuer.

By Becca Posterino

Calculating the survival timeframe for a person depends on the individual circumstances of each incident and the person involved. Environmental conditions, a person's age, fitness, clothing, last food and drink, physical injuries and their mental and emotional disposition are just some of the factors affecting how long a person can survive in a life-threatening situation.

Paul said that in any given situation these factors are constantly changing but a person's life experience and level of resourcefulness can have a strong influence on the outcome.

'One particular search and rescue operation stands out,' Paul recalled.

In 2005 a Brazilian national got lost for 10 days in the thick scrub of Moreton Island, off the coast of southern Queensland. The Police SAR co-ordinator spoke to Paul throughout each day—Paul's analysis of the missing man's TFFS was a critical factor that influenced the decision to continue the search.

'I was aware the missing man had worked as a tour guide in the Amazon Rainforest and thanks to a night of rain on Moreton Island while he was lost, his TFFS extended, so there was a glimmer of hope the missing man might still be alive,' he said.

Based on this background knowledge, the apparent skills of the lost man and the fortuitous weather conditions on the island, Paul concluded survival was possible, but by the tenth day, his advice was that the TFFS would extend until the end of that day, but not longer.

'I thought at best, the man would use leaves to funnel rainwater into his mouth; he would find his way to the top of the sand dunes to get his bearings, walk down through the dense vegetation and try to follow the sunlight in a particular direction, and find his way to the beach or to the road that crossed the island,' Paul said.

'Then at night, he might locate a gully and dig into the mulch at the bottom for protection and to try to sleep,' he added.

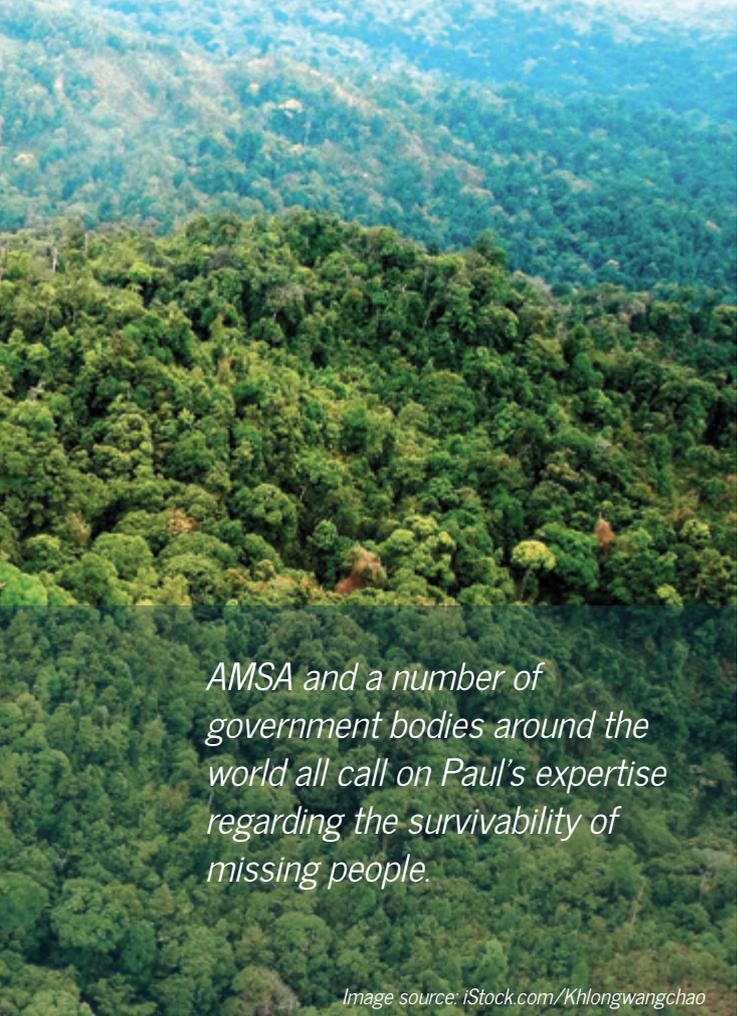
Paul remained convinced that he could still be alive, so the search continued with relentless determination. Paul's analysis, based on his own resourcefulness and that of the lost man, well and truly paid off.

'On the tenth day, just after lunch, only a few hours before the search was going to be called off, the man was found on the edge of death, but thankfully alive,' Paul said.

AMSA, police SAR teams across Australia, and the Australian Federal Police in stations from Manus and Naru to Papua New Guinea and the Solomons all call on Paul's expertise regarding the survivability of missing people.

Paul's expertise is the sum of a lifetime of professional and personal experience.

Born in South Africa, Paul decided he wanted to be a doctor when he was just eight years old.. Later in Hobart, Tasmania, Paul joined St John Ambulance, before training as a professional paramedic, where he experienced first-hand the true value



AMSA and a number of government bodies around the world all call on Paul's expertise regarding the survivability of missing people.

Image source: iStock.com/Khlongwangchao



Profile

Expertise: Dr Paul Luckin talks to AMSA about resourcefulness – *Image supplied*

of pre-hospital emergency medical care. This has been a major part of his life ever since, in his parallel careers in anaesthesia, SAR, the Royal Australian Navy, and St John's Ambulance.

From being a paramedic it was not a big leap for Paul to study medicine back in South Africa at the University of Witwatersrand, and then specialise in anaesthesia in Durban.

'It was first world medicine dealing in third world conditions—with a huge trauma load,' Paul said.

Gunshots, stabbed hearts were par for the course for Paul as a specialist anaesthetist in training. Most of the trauma he treated was learnt on the job, beyond the textbook, and once again resourcefulness was an asset he tapped into to endure the experience, both professionally and personally.

Since then, Paul's medical experience and canny instinct has helped save many lives. Yet for Paul, one very distinct experience continues to evoke the most powerful of memories—the 2004 Indian Ocean tsunami.

Paul was a member of the combined Australian surgical team. They arrived in Banda Aceh, in Indonesia's island of Sumatra, four days after the tsunami hit, as the first western medical team. In spite of having a lifetime of medical experience, he never anticipated the personal toll this experience would have on him.

'Nobody comes home from that experience intact. Nothing can prepare you for a place where 160,000 people have been killed in one city. The patients we treated were all severely injured, with grossly infected wounds, and all close to death. You do what you have to do and you come home and support each other as well as you can' Paul explained.

Paul's experience in Banda Aceh was a true test of his resourcefulness. He explained how challenging the conditions were, caring for the worst of the survivors. He and his colleagues had few drugs, no anaesthetic equipment, and a few basic surgical instruments. There was little more than plastic tubing or repurposed old

metal clamps to serve as tourniquets, for amputations performed with an old woodworking tenon saw.

It is clear Banda Aceh has shaped Paul professionally and personally. Resourcefulness is one of many qualities he has garnered—that, and baring witness to the force of nature and fragility, yet sheer determination, of humanity.

So when it comes to the personal qualities of a search and rescue doctor, Paul possesses the innate quality of both psychological and professional resourcefulness, but he adds that black humour has been a salve through some of the most harrowing experiences of his professional career.

'That and my faith, family and friends enable me to do my job, and hopefully to be moderately normal at the end of it'



Lucky escape: Lindsay's boat being retrieved after it capsized – Image supplied by Lindsay Lankester

Wipeout

Lone-fisher Lindsay Lankester opens up about how he survived when a breaker caused his boat to capsize two nautical miles from land. His GPS-enabled EPIRB was key to his rescue, but getting to it was a test of Lindsay's physical and psychological endurance.

By Sarah Cameron

Sunday 27 October had been a hot day—about 30 degrees, 1.8-metre swell and no wind.

After dropping his crab pots in the reef off the Perth coast, WA, at about 5:30 in the evening, Lindsay headed home, taking the inside of the reef as he went.

Later, Lindsay reflected how he may have been too complacent in assessing the conditions.

'I thought—the conditions are good, I'll just cut back through the inside on the way back—but this time the breaker was bigger than I thought,' he recalled.

Before he knew it, the propeller hit a bit of reef and a big breaker picked up the back of the boat. Without time to square up the boat, the last thing Lindsay saw was the nose of the boat getting pushed under the water, and then it rolled.

'It happened so quickly—my first thought was of protecting my head, so I jumped out to the side of the boat, hitting the white wash. Waves washed over my head and the noise of foaming water filled my ears,' he recalled.

'I made it back to the upturned boat and sat on the hull thinking—damn, what just happened?'

Lindsay said that on any other day, he might have been able to get help from fishing boats returning from Rottnest Island, but on that evening—Murphy's Law—nothing passed by.

Although he could see land about two nautical miles away, it was too far to swim. That's when he remembered his EPIRB fixed to the inside of the hull.

'I jumped into the churning water to get the EPIRB out from under the upturned boat. After my first and second

attempts at removing the beacon, I sat back on the boat to get my breath back and tried to work out why the EPIRB wasn't coming free. I looked down and realised I had cut my hands in the process and blood was streaming down the bow into the water,' he said.

'By this time it was dark and I thought—all I need now is for a shark to come along!'

With the swell getting bigger and choppy, Lindsay sat on the bow freezing—his badly bruised legs constantly slipping into the water.

'I was shivering cold and could feel hypothermia setting in. I knew I was using a lot of energy and didn't know if I could last all night out there,' he recalled.

'That's when I decided—there's no way I want my mum going to my funeral, I don't want to die out here.'

Then Lindsay remembered—to get the EPIRB out he first had to undo the bracket securing it.

'I was getting tired and my legs were cramping up but I jumped in again. It took me two more goes and by this time it was pitch black,' he recalled.

'Diving under the boat, I had to navigate by feeling my way. I knew the EPIRB was attached roughly below the passenger seat, so I grabbed onto the side rail of the boat and positioned myself near the seat. I tried to float and relax to get my breathing and heart rate down, to help me stay under for as long as possible. When it's that cold—and your body is shivering—you can't hold the air in for very long.'

On the first attempt, Lindsay ran out of breath, but on the second go he managed to release it.

'The water would have been 15–20 metres deep. I swam out from under the boat I thought—*don't drop it, you've got to tie this off before you even activate it*,' he said.

'I was familiar with how to activate the EPIRB because after I bought it I actually read the instructions. It was so dark at the time, I wouldn't have been able to read—I couldn't see a thing. Then I unwrapped the cord, put six or eight knots in it and held on.'

At first Lindsay wasn't sure whether the EPIRB had activated.

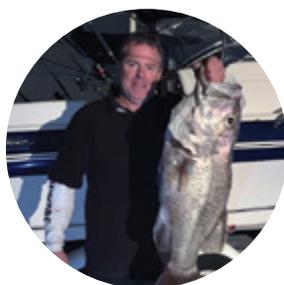
'It beeped and flashed faintly and I thought *it must have set off*, but I wasn't sure so I started thinking about locating my flares,' he said.

AMSA Response Centre (ARC) Coordinator Daniel Redondo said, 'the ARC received a detection of a GPS-enabled EPIRB registered to a 6.2-metre vessel two nautical miles from Ocean Reef, in WA at around midnight.

'We contacted Fremantle Water Police to task the police rescue helicopter *Po/Air 61* and Whitfords Volunteer



Lindsay's boat before: – Image supplied by Lindsey Lankester



Get an EPIRB with GPS, which gives rescuers coordinates to within 120 metres of your boat, and put it in a location that you can access easily. And learn how to use it!

— Lindsay Lankester

Marine Rescue to task a rescue boat to the scene,' he recalled.

Less than an hour after activating his EPIRB, Lindsay saw the spotlight of the rescue helicopter in the distance.

'It came straight for me pretty quickly,' he said. 'Within ten minutes of the helicopter being there I saw a blue light moving across the water toward me—it was the rescue boat—and the ordeal finally ended.'

'Afterwards people said to me "You should buy a lotto ticket, you're so lucky". But at the end of the day I bought the EPIRB and registered it, and I went through the practice of how to use it in an emergency situation—I stayed with my boat, I activated the EPIRB—and I'm here today because I was prepared,' Lindsay said.

Daniel added that if Lindsay's EPIRB had not been GPS-enabled, the ARC would have only received the first non-GPS position, which was seven nautical miles inland.

'If his EPIRB had not been GPS-enabled, the search and rescue mission would have been significantly disadvantaged. The GPS position, allowed us to pinpoint Lindsay to within 120 metres very quickly.'

When asked what advice he would give to others, Lindsay was adamant.

'Get an EPIRB with GPS, which gives rescuers coordinates to within 120 metres of your boat, and put it in a location that you can access easily. And learn how to use it! When you buy it—register it, get familiar with opening the bracket, pull it out and have a look at the switch. If you've got kids or crew—anyone on board—show them how to use it too.'

Lindsay's experience highlights the importance of being prepared at sea, regardless of how experienced you are or how favourable the weather conditions. Having a registered, GPS-enabled EPIRB is a lifeline at sea for mariners and for search and rescue, it is a critical to their mission to save lives.



Keeping Connected

Calls handled: 136,992
 Minutes on the phone: 856,200
 which is 5.2 years!
 Walk-ins in regional offices: 2082
 Longest customer interaction: 2h 12min

Inspections

Domestic vessel inspections: 2752
 Port state control inspections: 3222
 Port state control detentions: 163
 Number of ships banned: 2
 Letters of warning issued: 3



Certificates assessed and issued

Domestic qualifications: 9042
 International qualifications: 3913
 Domestic vessel permissions: 9222



AMSA on the road

Events we went to: 15
 Enquiries at events: 1461
 SMS workshops run: 52

Saving lives at risk

Operational incidents conducted: 10,292
 Lives saved: 234
 Tasked assets: 704

Beacons

Beacons registered: 50,001
 Total number of beacons registered: 627,480
 Proof of registration sent: 1,435,665



Challenger jet

Tasks: 192
 Items dropped: 41
 Hours in the air: 850



Helping to light the way – AtoN maintenance

AtoN sites visited: 300
 Hours in helicopter flights: 500
 Work orders completed: 2300
 Litres of paint used: 2500
 Lights changed: 50



Bins on boats

The Philip Island Nature Parks and South East Trawl Fishing Industry Association (SETFIA) are rolling out 100 weather-proof bins for commercial fishing boats across Victoria, to stop net fragments and rubbish from being lost overboard and impacting marine wildlife.

By Dr Rebecca McIntosh



The bin program will help in the waste management procedures we already have in place on board our vessel.

— Luke Hill

Responsible: Luke Hill is an active participant in the program – Image by Ross Holmberg

The Bins on Boats Program was created when fragments of plastic, removed from Australian fur seals, included locally made fishing lines, ropes, and net fragments discarded by both recreational and commercial fishers in Victoria.

SETFIA Chief Executive Officer, Simon Boag, is a strong advocate for the uptake of the bins on commercial vessels saying the Bins on Boats Program is an example of sustainable fishing practices to protect the future of commercial fishers.

A survey of vessels and their operators found many boats manage onboard waste themselves, but not all have a sustainable system in place. Now half-way through the three-year project, 85 of the 100 bins have been adopted.

Luke Hill is a trawler and gillnetter from San Remo, Victoria, who has placed one of the bins on his vessel *Metis*.

'Fishers genuinely care for the ocean environment we make our living from. The bin program will help in the waste management procedures we already have in place on board our vessel,' Luke said.

In Victoria, Australian fur seals regularly become entangled in marine plastic, including bags, caps, hair bands, balloon ribbons and string, as well as fishing gear. The fact that fur seals come ashore to rest and breed makes them ideal ocean sentinels for learning about the health of the ecosystem.

Marine Scientist with Phillip Island Nature Parks, Dr Rebecca McIntosh, says the fur seals are just one species they see affected, but if the seals are getting entangled, so are other species.

On any given day at Seal Rocks—almost two kilometres offshore from Phillip Island—there can be as many as 11 individual fur seals entangled in marine plastic pollution. Pups and juveniles are most commonly entangled because they are naïve and playful. As they grow, the restrictive material becomes embedded, causing painful infections and a slow death, often from starvation.

'It's a terrible way to die. The entangled seals are often in a lot of pain and it is very difficult to catch them in the colony because they run into the water when they see a person approaching,' Rebecca said.

'Phillip Island Nature Parks catches many affected seals to remove the entanglement, but it's a band-aid on the wider problem of marine plastic pollution. We need to get to the heart of the problem and reduce the amount of plastic entering the ocean.'

The Bins on Boats Program also involves gathering information about the ways the bins are used on the boats to help inform new ways of addressing plastics in the commercial fishing industry, including recycling potential.



To get involved:
email: webenquiries@setfia.org.au
penguins.org.au/conservation
setfia.org.au

A photograph of two divers underwater. The diver in the foreground is wearing a red wetsuit and a blue mask, looking towards the camera. The second diver is behind them, also wearing a mask and giving a thumbs-up. The water is clear and blue.

Induction into safety

Charter operator Mike Keyte talks to AMSA about how he creates a culture of safety among his crew.

By Peter Strachan



Snorkelling in safety: Mike Keyte ensures the safety of holiday makers through robust safety measures and crew training — *Image by Mike Keyte*



I apply risk assessment to everything—from before we even move the boat, to after we have disembarked our passengers and secure the vessels.

— Mike Keyte

Mike Keyte was sailing with friends to Cairns in northern Queensland twenty years ago when he stopped at Airlie Beach and established today's Wings Whitsunday Adventures—a marine charter operation catering largely to the backpacker market.

The operation grew quickly, but five years ago the worst thing imaginable happened when a passenger drowned while diving after becoming separated from the dive instructor on one of Mike's diving trips on the Great Barrier Reef. While he always took pride in the safety of his operation, this tragic accident was a turning point for Mike and his operation.

'To this day this is a very hard issue for me and my family, not to mention the family of the girl who lost her life, the crew and other passengers,' Mike said.

'I learned many lessons but the biggest for me was realising the importance of creating better safety systems and documentation—starting with comprehensive induction programs for crew members at all levels and a practical introduction to our safety management system (SMS),' Mike said.

Like the rest of the Whitsunday's charter industry, Mike operates virtually year-round with scheduled charters around the islands six days a week. He also does outer-reef and non-scheduled private charters for larger groups, so a robust yet practical SMS that effectively engages crew and passengers is key to safety.

Mike said he believed the way he helped his crews to achieve best practice was to develop an SMS around three main categories—risk assessment, procedures and the maintenance system.

Mike said that as part of his procedures he tailors crew inductions for each type of charter to be clear, but also flexible enough to encourage people to think on their feet.

'Our inductions for crew cover a vast array of topics and establish individual responsibilities for risk assessments, duty of care while at work, food safety training—including allergy procedures—galley safety, sewage and pollution control, personal hygiene, protective clothing and our cleaning and sanitising processes...the list goes on,' Mike said.

'We also explain things like our emergency procedures, head-count procedures, surface watch training and the potential risks associated with taking short cuts on any aspect of safety,' Mike said.

'When I talk to my crews, I sometimes see that they have a hard time explaining the meaning and purpose of risk assessment. Whenever that occurs it signals the need for a second training assessment as soon as possible—and a third and fourth if necessary.'

Mike said training was steadily becoming a bigger issue in the maritime industry and all businesses needed to meet regulatory requirements, and have and maintain best practice.

'I find there is plenty of help available—for example, work place health and safety provides our industry with a snorkel worker training assessment. This 22-item list helps us clearly assess crew skill levels on everything from identifying snorkellers most likely to be at risk, to how to best help a snorkeler in difficulty,' he said.

Maintenance is also a big part of Mike's safety management. Mike used the Marine Surveyor Manual vessel checklist to develop a list of weekly, monthly, quarterly and yearly jobs, as well as a slip register.

'In simple terms, the crew checks the items listed and reports back on items that need attention, or jobs they have completed while at sea,' Mike said.

'This, in turn, is updated in our cloud-based maintenance log. Items that still need to be taken care of are then prioritised and addressed,' he said.

Mike said his safety management system developed using trial and error, and was continually evolving.

'I apply risk assessment to everything—from before we even move the boat, to after we have disembarked our passengers and secure the vessels,' he said.

'We can have a conversation about an issue or a risk, for example, and within a few hours have a new system or an updated SMS in operation. The way we've set it up, it's easy to change, making it practical to rapidly implement changes as the need for them is identified.'



Safety for all: Holiday makers at Whitehaven – Image supplied by Mike Keyte

Mike said a well-trained crew with a positive approach to all safety issues on board and ashore pays off for all involved.

'A well-informed, educated crew makes everybody's job easier. It means we have a philosophy of working through all the important issues—we all get on the same page,' he said.

'It can be challenging at times, just keeping safety as the key priority for all of the crew, but clear and well-understood procedures help with this. Giving everybody a voice helps too. It's always important to encourage and allow everyone to speak up and

have their opinions respected in the workplace,' Mike said.

'I know my senior masters haven't all liked the changes we've made, but in general I think, like me, they see the great benefits the improvements bring to all of us and those who sail with us.

'It's about having the right inductions, systems, documentation and ongoing training for all.'

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A well-informed, educated crew makes everybody's job easier. It means we have a philosophy of working through all the important issues—we all get on the same page.

— Mike Keyte

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**YOU'RE THE SKIPPER
YOU'RE RESPONSIBLE!**

Building knowledge in China

When local shark fishermen Jamie Pappas and his father, Jim, decided to invest in a new fishing boat, they took the bold step of having it purpose-built in China—and then sailed it all the way back to Australia.

By Simon Enticknap



Compliant: Jim and Jamie Pappas (inset); *Marylou 1* under construction in China – Images supplied

Based in San Remo in Gippsland, Victoria, the pair have 40 years' experience fishing the waters of Bass Strait between Victoria and Tasmania. Drawing on this knowledge, and incorporating the best features from previous vessels they have operated, they designed a multi-purpose vessel adaptable to different catches and fishing methods. Having come up with their ideal design, they then contracted a boat builder in China to make it for them.

The result is *Marylou 1*, a 23.9 metre steel-hulled, heavy weather boat, currently being used for gill netting but also suitable for crabbing, scalloping or longlining.

A key aspect of the design and build process was working with AMSA and the Chinese Classification Society (CCS) to manage the certification process using China-based marine surveyors. It was the first time that AMSA and the CCS have cooperated on the certification for the construction of a fishing vessel.

According to Jamie Pappas, the advice provided by AMSA was crucial in ensuring the boat met the required standards.

'Kevin Porter [AMSA Principal Marine Surveyor] was one of the great advisors and mentors I had building this vessel, a fantastic fellow,' he said. 'I was happy to listen to what he had to say and took full advantage of his knowledge.'

Based on AMSA's advice, the vessel was registered as a Regulated Australian Vessel (RAV), rather than as a Domestic Commercial Vessel, enabling it to operate in international waters. As a result, when arrangements to transport the vessel to Australia fell through, Jim Pappas was able to hire a crew in accordance with international maritime requirements and bring *Marylou 1* home.

The voyage took five weeks to reach San Remo—three weeks from China to Cairns where the international crew flew home and another 12 days down the east coast. Along the way *Marylou 1* encountered some rough weather, including typhoons, but the crew—

many of whom had never worked on such a small boat—were impressed with her sea-handling abilities.

'They couldn't believe how stable the vessel was in big weather,' said Jim.

Because of the preparatory work done in conjunction with AMSA during the build, no further modifications were required in Australia before the vessel went straight to work.

The father and son team are keen to pass on the knowledge they've acquired to other fishermen looking to undertake similar projects.

'We successfully designed, built and delivered the project in total compliance with all marine orders,' said Jamie.

Regulatory requirements for Regulated Australian Vessels
amsa.gov.au/rav



Safety first as Sydney puts on a show

Spectacular: Sydney Harbour Bridge alight with fireworks on New Year's Eve – *Image source: iStock.com/LeoPatrizi*

The summer months see Sydney Harbour stage a series of spectacular events watched by millions of spectators, both on and off the water. Managing the safety risks associated with such events calls for a coordinated response from everybody involved.

By Simon Enticknap

Nobody does fireworks quite like Sydney. The city's iconic New Year's Eve display is one of the biggest public events staged around the world, regularly drawing about a million spectators at viewing sites around the Harbour and a global television audience of up to a billion viewers.

While most of the attention is on the dazzling display lighting up the sky, behind the scenes a huge logistical operation takes place to ensure the new year is brought in safely for everyone involved.

In fact the New Year's Eve fireworks are just one of a number of special events held on the Harbour over the summer that draws a large fleet of spectator craft, including the start of the Sydney–Hobart Yacht Race on Boxing Day and the Australia Day celebrations.

All of these events require specific safety management plans to ensure they operate without incident—for people directly involved in staging them as well as for the boaters, commuters and charter-boat operators sharing the harbour.

Banks Events has specialised in creating and coordinating these on-water events in Sydney for decades.

Senior Consultant at Banks Events Adam Huie said over the last 30 years they have seen the event risk analysis and mitigation strategies develop significantly.

'Years ago safety management was no more than box ticking—in theory we were meeting our obligations, but not in reality, as nobody knew what to do. Today, however, risk management forms an integral part of the overall operational plan,' Adam said.

Brad Hosemans, Chief Operating Officer at Polaris Marine has also seen safety management become integral to all firework displays staged on the harbour.

Polaris Marine supplies the tug boats and barges used as floating platforms on the harbour for the several tonnes of fireworks ignited on New Year's Eve.

'Packing Class 1 explosives onto a barge and then towing it into the middle of a huge crowd and setting them off carries a unique set of risks, one which calls for careful preparation and highly skilled operators on the night,' he said.

The planning begins well in advance, beginning with making sure that the right-sized barges, with all the relevant permissions, are matched to the amount of fireworks being used. For the four main barges on New Year's Eve, two tugs are used to hold each barge

in position at the end of 50-metre lines. Smaller barges can be strapped up to a single tug.

A coordinator—usually Brad—oversees the positioning of the barges from a high vantage point, while GPS is also used to ensure the barges are in the right place for the best effect.

Even so, on the night, weather conditions may dictate that the barges have to be moved to account for changes in wind strength and direction.

Then, as soon as the display is finished, the barges must be strapped up again as quickly as possible and moved off the harbour. This is when the tug masters really earn their money—operating in the dark and surrounded by hundreds of spectator craft, some of which insist on coming closer than allowed. It's a high-pressure situation which requires great teamwork to avoid incident.

Managing the exclusion zones and vessel traffic on the harbour is a crucial aspect of the display.

Senior Special Aquatic Events Officer at Maritime, Drew Jones, said on-water safety management requires close coordination between the event organisers and all the stakeholders.

'For example, with New Year's Eve, the event is owned by City of Sydney but we work in consultation with the ferry operators, commercial vessels, the port authority and the people supplying the event, such as the barge operators and tug companies,' he said.

Drew said the cooperation between government and non-government agencies is a key factor, which distinguishes Sydney when it comes to staging such events.

'There is a really cooperative network between the agencies and we all respect each other's positions, so we won't make decisions for other agencies, but at the same time we're happy to collaborate on solutions to promote Sydney as a great place to run an event.'



Safety first: Barge packed with explosives in Sydney Harbour – Image supplied by Foti Fireworks

Packing Class 1 explosives onto a barge and then towing it into the middle of a huge crowd and setting them off carries a unique set of risks, one which calls for careful preparation and highly skilled operators on the night.

— Brad Hosemans

'That's one of the legacies of the 2000 Summer Olympics in Sydney,' he said.

In simple terms, the marine exclusion zone provides a 'stage' on which the event organiser can perform, while Maritime has responsibility for controlling what goes on around the zone's edge, in terms of spectator craft and vessel movements.

Drew said the exclusion zone system has evolved over the years and is now well-understood by the majority of spectators and harbour users. That's not to say there aren't always a few rogue vessels that stray too close.

During the event, Maritime runs the Sydney Harbour Operations Centre at its Rozelle headquarters with CCTV coverage of the harbour and radio links

with the various sector commanders in the exclusion zones. If something happens on the water requiring further action and coordination, the centre provides a key point of contact with other government agencies.

Right at the heart of the display are the firework operators who control the firing sequences on board the barges. On the larger barges, they occupy a shipping container from which they oversee the firing plan for each section.

Foti Fireworks has staged the New Year's Eve displays since 2000. Each year the company amends its own risk management plan, incorporating lessons learned from the previous year, and a detailed firing plan is developed and used to brief all the staff and tug boat crews. *Continued overleaf...*



Skilled operation: A Foti pyrotechnician inspects the fireworks on a barge – *Image supplied by Adam Huie*

According to the company's Work Health and Safety Manager Tim Gray, most of the individual operators have worked on the same barge positions every year, which means they are highly experienced when it comes to assessing risks and applying pre-arranged mitigation strategies as they arise during an event.

'Things can go wrong at an individual firing position and there are also things external to a firing position that can affect it. Knowing what you have to work with inside the exclusion zone, the type of platform you have and the type of fireworks display you are delivering, allows you to make decisions on the fly,' he said.

If a stray boat enters the exclusion zone, for instance, the firework operators use laser distance finders to measure how far away it is and, depending on the conditions, whether or not it poses a risk. Once the risk is identified, Roads and Maritime Services and Water Police can quickly move in to resolve it.

If the display needs to be stopped, Foti Fireworks uses a software firing system that allows for individual firing sections to be shut off until a problem is fixed and then restarted in sync with the music. There is also a kill switch to stop the display completely if necessary.

By allowing individual operators to assess and mitigate risks in their

sections, Foti can ensure that the show always goes on.

Tim agreed that the cooperation between event stakeholders, in terms of safety set-up and management, has set the standard for other displays around the country and even globally.

'Sydney has become the benchmark for all of our operations,' he said.

So next New Year's Eve, when you sit back to enjoy the pyrotechnic displays over Sydney Harbour, raise a glass to the dedicated marine professionals working behind the scenes to ensure that the new year arrives safely for everybody involved.

2020 sulphur fuel limit

From 1 January 2020 all vessels must use fuel that contains no more than 0.50 per cent sulphur.

While heavy fuel oils used by larger vessels contain higher sulphur levels, most diesel and petrol sold in Australia as marine fuel already contains less than 0.50 per cent.



Checking your fuel's sulphur content

If you aren't sure about the sulphur content of your fuel, check with your supplier.

If your vessel is 400 gross tonnage or above, your supplier must give you a bunker delivery note with each fuel delivery which includes the sulphur content of your fuel.

Your supplier also needs to be registered with AMSA.

Carrying fuel with a sulphur content above the limit

In addition to the 1 January 2020 sulphur limit, from 1 March 2020 fuel with a sulphur content of more than 0.50 per cent sulphur cannot be carried on board.

This doesn't apply to fuel carried as cargo.





Stay Afloat

#drownthestigma on mental health

The Tasmanian Seafood Industry Council (TSIC) has partnered with Rural Alive and Well (RAW) Tasmania to tackle the issues of health and wellbeing in the seafood industry and the regional communities it supports around Tasmania, through the Stay Afloat initiative.

Anyone in the fishing sector or surrounding regional communities needing help and support relating to their mental health can now call 1300 HELPMATE for assistance. The 24/7 service will connect to the RAW team in Tasmania.

'RAW is exactly what our seafood industry needs—real people, one-on-one, listening, hearing, compassionate, caring. Every single RAW staff member I have met is exceptional at their job. I know that if I call RAW, action will happen,' TSIC CEO Julian Harrington said.

TSIC acknowledged it had to make a difference in response to Dr Tanya King's national Safety, Health and Wellbeing survey which confirmed that fishers are almost twice as likely as other Australians to experience increased psychological distress.

The study revealed that 16 per cent of fishers experienced 'high' levels and 6.2 per cent experienced 'very high' levels of psychological distress. In comparison to eight per cent (high) and 3.7 per cent (very high) of Australians aged 18 years and over, this suggests that the high levels of psychological distress among members of the seafood industry is due to occupation-related stress.

Julian said this is not surprising, as the seafood industry has its own unique set of stressors and challenges—from increasing regulation, and access to resources, through to the impacts of harmful algal blooms and the unpredictability of both Mother Nature and fishing itself.

'Put on top of this the normal financial and relationship hardships, and our seafood industry is really suffering,' he said.

'Families suffer too—wives, kids and communities. I am personally aware how families, friends, work colleagues and communities suffer when someone makes that fateful decision to take their own life.'

Other states and Seafood Industry Australia have also acknowledged the RAW model, and are looking to connect similar mental health support services in their regions, with the aim of Australia-wide coverage in the near future.

'If a boat is in trouble at sea, everyone stops what they are doing to provide assistance and help. We need to encourage our fishing industry to do the same on land because their mates, their colleagues or their family could be drowning and they are nowhere near the water,' Julian urged.

tsic.org.au/stayafloat
1300 435 762



Ambassadors: Ray Martin OAM and Julian Harrington stand together to #drownthestigma on mental health – Image supplied by TSIC. © News Corp Australia

Safety, sustainability and self-reliance

Tour operators on the Gordon River in Tasmania's heritage-listed southwest face considerable challenges in planning memorable excursions for passengers, while minimising their impact on this spectacular and pristine environment.

By Peter Strachan



Operating in one of the most remote areas of Australia's southern-most state, battered by the relentless winds of the roaring forties, two local operators recognise the need for careful planning, reliable communication and a high standard of equipment maintenance.

The Grining family—owners of World Heritage Cruises—have been operating in the area since 1896, when they carried supplies to the mining and timber industries and the early settlers along Tasmania's west coast in the 1800s. They became much more active in the cruise market in the 1980s.

Gordon River Cruises has been operating on the river, in Macquarie Harbour and nearby waters since 1987. Its latest vessel is a 33-metre diesel–electric hybrid catamaran, allowing it to move through the ancient landscape in silent mode using just its e-motors.

Gordon River General Manager Geoff Evers said Strahan's remoteness was both a challenge and an attraction for visitors and staff.

'We are over two hours' drive from Burnie in Tasmania's northwest, and over four hours from the state's capital, Hobart, making staff recruitment and vessel maintenance quite challenging,' he said.

'We need to be self-sufficient by making sure we have specialised skill sets in our team and maintaining a robust preventative maintenance program, and our crew must all be aware of the risks in the area to minimise incidents,' he added.

Macquarie Harbour presents environmental challenges for new skippers, with depths ranging from 50 centimetres to 30 metres—some of it uncharted—but according to Geoff, the weather presents the toughest challenge.

'It rains about 300 days a year and is exposed to very strong westerly and northwesterly winds. Since installing new and advanced wind gear to assist our skippers, we have recorded true wind speeds in excess of 65 knots,' Geoff said.

Joint owner of World Heritage Cruises,

Troy Grining said that when the vessels sail to Hobart in the winter to undertake maintenance surveys—a trip of 200 nautical miles around the southern coast of Tasmania—the elements take a toll on the craft.

'These challenges are all manageable of course, but we would not have to contend with them in a more settled and less weather-intense area,' he said.

Operators are proactive about identifying and mitigating risk, operational rules and keeping staff trained.

Geoff explained that every Tuesday afternoon the skippers and crew undergo safety training, where they cover operational and emergency safety procedures including anchoring, flooding, grounding, man overboard, and bomb threats.

Troy added that even with safety at front of mind, things can still go wrong. When this happens both operators take the opportunity to learn and improve their safety management system.

'In addition to reporting our incidents to AMSA, we review incidents and



Prioritising safety: (from left) Gordon River Cruises on the Gordon River – *Image supplied by Gordon River Cruises*; Staff from World Heritage Cruises participate in Harbourmaster training; World Heritage Cruises passes through Hell's Gate on the Gordon River – *Image supplied by World Heritage Cruises*

examine how we can do things better, putting the changes into practice as quickly as possible,' Troy said.

Geoff said that recently Gordon River Cruises experienced a loss of steering control as the vessel left the river, which ultimately resulted in a number of new operational procedures and protocols after they had examined exactly what went wrong.

'The incident was caused when a passenger visiting the wheelhouse as a part of the tour, inadvertently knocked a circuit breaker to the 'off' position, causing the steering pump to stop, and resulting in the starboard hull hitting the sandbank,' Geoff said.

'There was no serious damage, but the debrief and investigation following the incident resulted in plastic covers being made for the breakers so that people nearby wouldn't inadvertently knock them in future.

'And passenger management became a greater priority for the master—we now limit access to the helm during times of high demand,' he said.

Troy said passengers moving around

In addition to reporting our incidents to AMSA, we review incidents and examine how we can do things better, putting the changes into practice as quickly as possible.

— Troy Grining

the vessel on wet decks in rough weather is always a significant risk.

Both companies conduct passenger inductions prior to departure. The presentations include lifejacket demonstrations, life-raft and muster stations, weather briefings, the importance of following crew directions, introductions to the crew, the need for caution when moving around the vessel, and external deck precautions.

In a medical emergency, the remoteness of the location means that the time it takes to reach medical assistance is a significant risk, which is covered off in their safety management systems

'In some cases, vessels can be an hour away from medical help in Strahan and more than two hours away from the closest hospital,' Geoff said.

Troy said that one of the ways they prepare for the remoteness is to keep the staff trained up on first aid and how to respond to medical emergencies, including how to use the on-board defibrillator.

'If in doubt regarding the wellbeing of a passenger or crew member we always err on the side of caution, returning to Strahan, and we always have reliable methods of communication, including satellite and mobile phones and two-way radio on hand.'

'The remote and pristine ruggedness of this area is what brings visitors to the area,' Geoff said.

'They come here trusting that we have everything in place to safely and comfortably get them up close with what makes this area unique.'

Making sense of safety at sea

Many seafarers say they 'just know' how to keep themselves safe at sea. A recent doctoral thesis delves into exactly how seafaring leaders make sense of, and deal with, a crisis or incident. It shows how to get the most out of this approach to strengthen on-board safety practices.

Ship sense: Dr Brad Roberts delves into how seafarers respond to dangerous situations at sea – Image source: iStock.com/Bali8tic

The thesis—undertaken by AMSA Liaison Officer in Victoria, Dr Brad Roberts—found that sense-making, also referred to 'ship sense' or 'gut feeling', is a common way that seafarers respond to a range of situations, from a near collision to a vessel sinking.

'This sense-making ability generally comes from deeply ingrained on-the-job experience, as well as social values, ideas and stories passed onto them by their crewmates, mentors and bosses as they learn how to lead at sea,' Brad said.

But, according to Brad, people don't often stop to think about the way they make sense of situations, or how they could use this ability to further improve safety for others.

'Shared ideas and stories are important in building safety cultures,' he said, 'because it encourages discussion about safety at sea'.

'When leaders consider how they can apply their knowledge and experience to the safety management system, it allows them to document it in a way that can be shared and applied in on board safety practices,' he said.

One master Brad interviewed had experienced a vessel sinking. When the incident occurred, the master thought it would be the end of his career as a master, but instead, the company he worked for used his experience to enrich their safety culture. As a result, his career as a master grew into one of proactively building on the safety culture in the organisation.

'After the incident his company supported him with mentoring that allowed him to regain confidence to sail as a master again,' he said.

'He became a mentor for new masters and played a leading role in developing the training, operational and emergency procedures within the SMS to make sure all future masters within the company were better prepared to face critical events.

'In addition to being a great example of how someone can use their experience for the benefit of others, it's also a strong example of how good organisational leadership can take a crisis situation and use it to develop capable leaders,' Brad said.



Shared ideas and stories are important in building safety cultures, because it encourages discussion about safety at sea.

— Dr Brad Roberts

Read the full thesis *The sea within: embodied cognition among seafaring leaders* at researchgate.net/profile/Bradley_Roberts

Australia's fishing industry bands together

In recent years a nationwide examination of mental and physical health among Australia's fishers and their communities has uncovered a serious need for targeted health services. Now Australia's close-knit fishing communities are tackling the issue from within to provide crucial assistance to those in need.

Emerging support services include the *Stay Afloat* program in Tasmania, a phone helpline which will soon become available nationwide. Meanwhile, Women in Seafood Australasia (WISA) continue to raise awareness of mental health issues within the seafood industry through initiatives like Project Regard. Other work includes the Sustainable Fishing Families pilot health program.

The wellbeing of people in the fishing industry is also a key priority at governance level, starting with peak body Seafood Industry Australia. The Fisheries Research and Development Corporation (FRDC) continues to support the research underpinning this sea change. Even the major political parties have pledged funding to support mental health programs for the fishing industry going forward.

This groundswell response across industry and government has taken place after research undertaken by Dr Tanya King substantiated the anecdotal evidence pointing to poor mental health—and more recently understood, physical health—in the fishing

industry. Tanya is a Senior Lecturer in Anthropology at Deakin University and also a Director of WISA.

Tanya's nation-wide survey delved beneath the anecdotal evidence to discover the reality behind mental health and wellbeing of the fishing industry—including attitudes to safety and help-seeking behaviour—and she uncovered some concerning trends.

'The key finding was the high levels of psychological distress reported by the people who took part in the research,' Tanya said.

'Of all the people who took part, 22 per cent indicated psychological distress at 'high' or 'very high' levels—almost double that of the general population.'

Tanya added 39 per cent of those surveyed felt that their GP did not understand the pressures of the fishing industry, magnifying the perception they were not understood by their wider community.

A more recent addition to the study has now revealed that in addition to poor mental health, the physical health of participants is also suffering.



Director of WISA: Dr Tanya King
– Image supplied

'We found that within the survey group, rates of health conditions including high blood pressure, high cholesterol, depression, type 2 diabetes and cancer were higher than the general Australian population,' she said.

Further analysis is underway to more clearly identify these concerning health results.

Read the full FRDC report—*Sustainable Fishing Families, Developing Industry Human Capital through Health, Wellbeing, Safety and Resilience*.
frdc.com.au/Archived-Reports/FRDC%20Projects/2016-400-DLD.pdf

Download the free *Sustainable Fishing Families Managing Stress for Fishing Businesses Handbook* and the summary of the report findings
womeninseafood.org.au/sustainable-fishing-families

Watch fishers around Australia share their experiences in WISA's Project Regard:
 [youtube.com/watch?v=e-QQqx3qGck&feature=youtu.be](https://www.youtube.com/watch?v=e-QQqx3qGck&feature=youtu.be)

What are we hearing from you?

Your questions help us to provide better information about meeting safety requirements and how to access our services. Here are some of the questions received at industry events and via AMSA Connect over the last few months.

1. What do I need to do when I change the engine on my domestic commercial vessel?

You must notify AMSA when you change the engine on your vessel.

Be aware that changing an engine may require the vessel to meet additional standards, undergo surveys and even be required to get a certificate of survey due to increased safety risks associated with the new engine. Your AMSA accredited marine surveyor will inform you if this is the case.

When you notify AMSA, you may also need to provide a recommendation from your surveyor, confirming that the change of engine does not invalidate the structure or stability of the vessel.

If your vessel has a certificate of survey or an approval to operate as a Restricted C operation under exemption 40* you will also need to complete the Notification of change of engine form (AMSA 1847). This form contains a checklist of items that are required to confirm the details of the new engine.

If your vessel is a non-survey vessel** notify AMSA of the change of engine by lodging an Application to vary a vessel certificate or approval form (AMSA 566).

[Find a form on the AMSA website
amsa.gov.au/forms](https://amsa.gov.au/forms)

* Exemption 40 is the Marine Safety (Class C restricted operations) Exemption 2018.

** Non-survey vessels are those compliant with the requirements of Exemption 02 Marine Safety (Certificates of survey) Exemption 2018.

2. Do I need a certificate of compliance for electrical work carried out on my domestic commercial vessel?

State and territory regulators require you to provide documentation for any low voltage electrical work carried out on your vessel. Low voltage is greater than 50V AC or 120V DC.

The purpose of the certificate is to ensure that the electrical work complies with, and is tested in accordance with the appropriate Australian standard.

You will need to retain this certificate and make it available to your accredited marine surveyor.

Contact your local state or territory electrical regulator for more information:

Australian Capital Territory
Certificate of electrical safety
accesscanberra.act.gov.au

New South Wales
Certificate compliance electrical work
fairtrading.nsw.gov.au

Northern Territory
Certificate of compliance – electrical safety
worksafe.nt.gov.au

Queensland
Certificate of testing and safety (work on electrical equipment)
Certificate of testing and compliance (electrical installation work)
worksafe.qld.gov.au

South Australia
Certificate of compliance
portal.statedevelopment.sa.gov.au

Tasmania

Certificate of electrical compliance
cbos.tas.gov.au

Victoria

Certificate of electrical safety
esv.vic.gov.au

Western Australia

Electrical safety certificate
commerce.wa.gov.au

3. What do I need to do if my vessel has become transitional due to lightship changes?

A periodic lightship check is required every five years as part of the certificate of survey renewal process.

Existing vessels are considered to be transitional vessels if there is a lightship variation in excess of:

- Displacement \geq four per cent, or
- Longitudinal centre of gravity \geq two per cent.

These changes will require the vessel to undergo a stability re-assessment and do a renewal survey to the transitional standards.

Meeting transitional standards will require installation of residual current devices, possible fire safety changes, as well as the safety, communication and navigation equipment requirements of the National Standard for Commercial Vessels (NSCV).

Your surveyor can help you determine exactly what changes you will have to make to your vessel if your lightship variation exceeds the margins above.

South Solitary Island Lighthouse haunted by ghost of girl buried in bathtub, former residents say

By Melissa Martin. Originally published in *ABC Coffs Coast*, 10 August 2019

In 1912, a 17-year-old girl died at a remote island lighthouse off the New South Wales mid-north coast.

She had succumbed to typhoid during a raging storm on the rocky island, leaving her family no choice but to entomb her body in a bathtub until she could be moved to the mainland.

When the storm calmed, Lydia Gow's body was shipped off South Solitary Island for burial, but some—like Darren Squibb, who lived on the island during the 1970s—say her spirit never left.

'I heard footsteps moving about the house,' Mr Squibb said.

'Mum told me later she'd go into the kitchen in the morning and find things rearranged.'

Buried in a bathtub

Selina Lydia Gow fell ill in November 1912 and her father, the principal lighthouse keeper, called for a doctor from the mainland.

Rob Trezise, a former lighthouse keeper and president of the Friends of the South Solitary Island Lighthouse, said heavy seas and strong winds hampered the doctor's journey, and when he arrived it was too late.

'Lydia contracted typhoid and that was, in those days, basically fatal. She passed away before they could get her off the island,' he said.

With the storm raging, there was no way of getting Lydia's body to the mainland for several days and burial was not an option.

The island is nearly all rock and there was really no top soil that they could dig up to put her grave on there,' Mr Trezise said.

Archives held at Lydia's final resting place, Sandgate Cemetery, state her mother did not want her body thrown into the sea, so she was placed inside one of two bathtubs, covered in either concrete or lime, before the tubs were soldered together.

The teenager was buried in Newcastle four days after her death and, according to some sources, she was still inside the tub.

'Her parents never went back to a lighthouse again, that was the end for them,' Mr Trezise said.





I could see what appeared to be a very shadowy, sort of flowing light up in the corner of the room; that's the only time I saw anything visually.

— Darren Squibb



From above: Lydia 1910 – Image supplied by Precision Helicopters; South Solitary Lighthouse – Image supplied by Mrs O'Gorman via Mark Sherrif.

Did Lydia really leave the island?

In 1971, then nine-year-old Darren Squibb moved to South Solitary Island where his father took a job as a lighthouse keeper.

From the first day, he said he felt there was something strange about their new home.

'I remember sitting on one of the boxes in the loungeroom and looking around and sensing there was something odd about the house.'

During his two years on the island, Mr Squibb said he became traumatised by a constant feeling of a presence in his room, the sounds of footsteps in the hallway and someone playing with his hair as he tried to sleep.

He also believes he saw the ghost of Lydia Gow after running into his mother's room during the night.

'I could see what appeared to be a very shadowy, sort of flowing light up in the corner of the room; that's the only time I saw anything visually.'

Mr Squibb said his father also believed he saw a ghostly figure in the house on a separate occasion but did not say anything until after the family left the island.

Following the encounters, Mr Squibb said he began having nightmares, started sleepwalking and became a "very nervous child", so his parents chose not to tell him they were having similar experiences.

'They downplayed my fears and concerns and experiences; it wasn't until probably eight or nine months after we came off the island that mum sat me down and she acknowledged for the first time, that yes, the house was haunted, and mum and dad had experienced things on an almost daily basis,' he said.

Mr Squibb has returned to stay on the island on several occasions to carry out restoration work on the cottage.

'I often think perhaps one day in the future I'd like to spend a couple of nights in our house—at the moment you can't because it's all boarded up and dilapidated.'

A visit to the mainland

For two weekends every August, tourist flights are made to South Solitary Island.

Staff at Precision Helicopters have their own stories to tell about Lydia—and even joke that she's been to the mainland.

'We do laugh that sometimes she might come back on the helicopter, just for a bit of a run around on the mainland, and then she'll just fly back out to the island,' office manager Jo Young said.

Ms Young had her own "unexplained" experience she believes might be Lydia's work.

When the tours were being conducted in 2018, she came into the office one morning to find a historic photograph of Lydia on the floor—three metres from where it was hung.

'I thought, "well that's a bit strange", it's never fallen off in the past two years and the other photo frames were all up, and so I put her back up on the wall, but then the next day it flew off again.

'Lydia's was the only frame that fell off the wall.'

Ms Young said the volunteers who restored the cottages often came back with stories of strange happenings.

'They hear sweeping in the passages, doors are locked and unlocked, and things are moved around,' she said.

'Last night a torch came on in the middle of the night and scared everyone—I'm not sure how that happens.'



Isolated: aerial view of South Solitary Island with lighthouse and keepers cottages – *Image supplied by Precision Helicopters*

South Solitary Island Lighthouse

Considered the most isolated lighthouse along the New South Wales (NSW) coast, the South Solitary Island Lighthouse is located 18 kilometres off the coast from Coffs Harbour.

Sitting at the peak of the eleven-hectare island, the lighthouse is exposed to some of the harshest weather conditions on the east coast of Australia, making construction of the lighthouse and delivering supplies by steamer, extremely challenging.

Architect James Barnet designed the lighthouse compound, and its construction was completed in 1880,

the first in Australia to be built from cement and sand. It stands 18 metres from the ground to its cap, and its internal structure measures 12 metres in diameter.

The original lens was a Chance Brothers first-order dioptric Fresnel lens. The lighthouse was also the first in NSW to be fuelled by kerosene, which continued to power the lighthouse until it was automated in 1975.

The only time the light has been extinguished was briefly during the Second World War in 1942 to deter enemy submarines that had been lying in wait and torpedoing Australian ships.

In 1910 a Morse signalling lamp was installed in a small wooden cabin beside the keeper's quarters and at one point in time a lighthouse worker used this to court his future wife across the way in Coffs Harbour, in Morse code.



**Margaret Kershaw,
Maitland, NSW**

'On our boat we have all the safety gear, plus radios and an EPIRB etc.'



**Patrick Rossiter,
Hobart, TAS**

'The communication systems—VMS, HF, VHF and satellite phone and also limited use of mobile phone.'



**Brian Hutchinson,
Rapid Creek, NT**

'A sat phone, a VHF radio and two mobile phones.'



**Dennis Lawless,
Darwin Waterfront, NT**

'On our boat we have got a GME VHF radio and an EPIRB.'

What's the most important aspect of safety on your boat?

Here's what people we met in Darwin and Melbourne had to say...



**Judy Ford,
Townsville, QLD**

'The most important safety feature on our vessel would be our sat phone so we can keep in contact, as well as the relationships we have with other commercial fishers who are operating in the same area.'



**Geoff Diver,
Bibra Lake, WA**

'EPIRBs are the most important piece of equipment on any boat and that will only increase with float-free EPIRBs.'



**Micheal Hobson,
Port Elwick, VIC**

'The thing between my two ears is the most important piece of safety equipment—it allows me to plan, look out for danger and take the necessary precautions to keep our operations safe.'



**Neil Morganson,
Townsville, QLD**

'The most important aspect of safety on my boat are the management skills with your crew. The most important device is our AIS A and B receivers so we can also transmit to the ships that are transiting the reef.'



Troy Billan, Yamba, NSW

'The most important aspects of safety on my boat are a competent, trained skipper, a maintained boat and lifejackets.'



Troy Rainbird, St Helens, TAS

'Teamwork is really important to safety management on a vessel. It's important for the crew to be aware of safety procedures and the location of EPIRBs.'



Community events

Over the last few months we've met with people from all around Australia. We started off in Western Australia (WA) at the Perth International Boat Show, where we had the pleasure of working closely with other Government Departments in the Maritime and Road Info Hub.



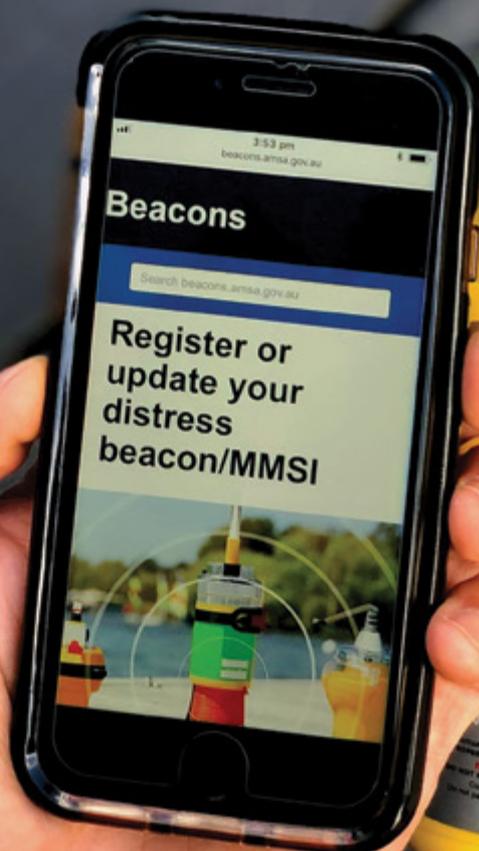
We met people from all over Australia at the biennial Seafood Directions 2019 Conference before heading back to WA for the Fremantle Ports Maritime Day.



Are you ready to head out on the water?

Make sure your beacon is registered with AMSA

To update your registration details or to learn more about beacons visit amsa.gov.au/beacons or phone **1800 406 406**



Australian Government

Australian Maritime Safety Authority

Registering your beacon is free and easy. In some cases it's required by law. Your registration information helps search and rescue authorities respond in an emergency. **Help us help you.**