2019 AUTUMN WORKSHOP
Newcastle 10-12th APRIL 2019
REGISTRATION OPEN

Dinner venue - Newcastle Club - 40 Newcomen St, Newcastle
Workshop venue - NOAH’S on the Beach - 29 Zaara St, Newcastle East
Please contact events@ampl.org.au for further information

 STRONGER TOGETHER

Combining dynamic under-keel clearance calculations with the world’s best marine weather forecasts
Increasing operational safety and efficiency

Opinions expressed may not be those of NZMPA

1 Captain James Cook Nathaniel Dance
3 Hue & Cry Hugh O’Neill
4 In Memoriam, Atta Eloyyan John Barker
5 Shared Mental Model Steve Banks
6 MNZ Thoughts on Nav Safety Sharyn Forsyth
7 Ports of Call Band of Brothers
11 Waka Matauranga Adam Eager
12 Maximising Situational Awareness Peter Dann
18 Risk Perception of Passengers Jennifer Holland
20 Captain Cook Prof. Bernard Smith
21 Cook’s Broth Hugh O’Neill

The Hue & Cry

Nathaniel Dance’s 1776 portrait of Cook was an excellent likeness, according to Surgeon’s mate, David Samwell: “He was a modest man, and rather bashful... In temper, he was somewhat hasty, but of a disposition the most friendly, benevolent and humane” (See pp. 20-21). Cook’s portrayal largely depends on perspective: subsequent events out with his control undoubtedly caused harm. As in the poem Invictus, we may be masters of our fate and captains of our souls, but we cannot be held accountable for the evils that other men do.

The 250th anniversary of Cook’s first encounter with NZ includes the Endeavour replica. (launched 1993) which visited NZ in 1996. (I sailed briefly as Navigator in 1997 when she visited the UK). See: https://www.captaincooksociety.com/home/detail/commemorations CCS is a superb resource.

As with Cook’s legacy, there is never-ending debate in these pages about BRM, its meanings and relevance. Debate is healthy and I have little doubt that the aircraft industry will have similar debates about CRM, especially in light of the belated FAA decision to ground the ill-starred Boeing 737 Max. Pilots had been reporting their concerns but were ignored, thus implying that professional opinions from the sharp end have not been sufficiently valued by the bigger system i.e. the ‘mental model’ was rejected. Might commercial pressures, blind faith in technology, regulatory laissez-faire and dysfunctional management create a lack of respect for professional pilots’ opinions?

Perceptions matter, even those not firmly grounded in logic (see p.18). If passengers have their foibles, then the smart money either caters to those foibles, or tries to change perceptions. Since we have yet to see unmanned civilian aircraft, then unmanned passenger ships are also unlikely. Furthermore, over-reliance on technology can create its own problems e.g. the helmsman steering by analogue ROT, whilst Ecdis predictors were based on digital ROT aligning poorly with the analogue in magnitude and time-delayed. (See p.12 for ‘perceptions, understanding & projections’).

Although commercial pressures impinge on everything, the costs of things going wrong invariably exceed any savings that might be made in cost-cutting and manpower reduction (p. 11). Big-picture-thinking by all parties requires that we make full use of technology, but with the constant caveat, that like Humanity, it can be fallible.

Smartship’s vision of pilotage as the “seamless integration of visual and instrument navigation” may imply that one is a check on the other i.e. pilots’ judgment remains a determinant factor. Pilots - perceived by some as expensive to train and maintain in optimum condition - still represent good value – unlike Boeing shares...
The Passing of **Atta Elayyan**, CEO, Lazyworm Applications

Atta was one of the too many tragically killed in Christchurch last week. Atta, the Lazyworm team and I had worked closely together on a number of innovative projects over the past 3 years specifically around the Master/Pilot Exchange Process and Virtual Reality Pilot Transfer Training. We had showcased these around New Zealand and Australia over the past two years, so I imagine that many of you would have seen Atta or been made aware of the fantastic work that he, Mike (co-owner) and the Lazyworm Team are doing for our industry.

His passion, innovation, forward-thinking, and wonderful personality made these great software products fantastic to be involved in and industry-leading in their nature.

He will be sadly missed, but his work lives on in our profession as we constantly strive to raise the bar.

John Barker
We are now 3 months post-conference and good progress is already being made on establishing our working groups to review and ultimately develop guidance on Good Practice for Pilots and Passage Planning. It was generally agreed at our conference that without matching passage plans there is little hope of achieving a shared mental model with bridge teams, and this issue was at the heart of the 3 NZ incidents which drove TAIC to put *Navigation in Pilotage Waters* on their Watchlist. Creating a shared mental model is however not simply a matter of having matching passage plans. We will continue to see a shift in the way we conduct business that will require us to go well beyond training alone. The foundations that underpin pilotage operations have been exposed as having many weaknesses and we now need to review our systems to ensure they are fit for purpose. Whilst the content of Rule 90 should ensure competency and proficiency is maintained at a high level, I feel the intent of the rule is not being met and oversight of this needs to be more thoroughly managed.

I was interested to hear from Ravi Nijjer prior to our conference, that he felt updates to his 2nd Generation BRM Course have been insufficient to keep pace with recent changes. On looking back through notes from the course, I found in his introduction to the course that passage planning and establishing a shared mental model was not addressed to the level that is proposed now. Following presentations at our conference and in light of TAIC’s actions regarding pilotage, we now have passage planning at the top of our list of matters to be addressed this year.

Whilst I will be retired before the new face of pilotage is established, many of our members will see enormous change during their career, a scene that I could never have envisaged when learning sextant and magnetic compass. For this reason I feel it is quite a possibility that unless maritime pilots adopt new technologies and modify their practices urgently, they may find themselves obsolete within the next few decades. Pilot ladder incidents may also become less common as the need to have a pilot physically on board a ship decreases. Remote pilotage was something I strongly opposed over the last decade or so when working with the tools and training we had, however recent trials in Europe have demonstrated that a human presence is not essential to get a vessel from A to B anymore. Yes, some types of ships are not changing at the rate we are seeing in the cruise industry, but we only have to look over our shoulders and remember what their equipment and practices were like 20 years ago. Obviously a cargo of thousands of passengers will justify higher levels of risk management, however a load of logs being carried on an autonomous ship will become the norm much sooner I’m sure. Of course when they arrive at our port limits we will want to ensure that they move to their berths under some form of local control, however this may see pilots operating in a similar manner to air traffic controllers. That then raises other questions, such as the need for a maritime background to achieve this, but that is an entirely new discussion. At our recent conference we comprehensively addressed some of the concerns relating to the present and the future, with proposals to keep abreast of our rapidly changing world now being actioned. Interesting times lie ahead.

Finally we must consider another development that has come with ECDIS, PPU and AIS, and that is the ability to monitor and recreate a passage in great detail. Many practitioners are suspicious and feel that the recording of a passage provides data to use against them in the event of an incident. For many pilots it will take time to trust their employer and the regulator, but unfortunately without this trust numerous learning opportunities are being lost. Our association has had good success with its Pilot Event reporting system which is providing valuable data, however only a minority of pilots are taking the time to submit reports. I am aware of and would be very pleased if we could come to a similar agreement to that which many US [airline] pilots have with their employer, the FAA and their association. “*The company will not initiate disciplinary proceedings against any employee who discloses an incident or occurrence involving flight safety. This policy shall not apply to information provided to the company by a source other than the employee.***” A similar stance by our industry would almost certainly provide the lead indicators that would expose problems within our industry. Unfortunately it is only after events such as the *Molly Manx, Azamara Quest* and *L’Austral* that we become aware of some of our systemic failings. I would be confident however that for each of these incidents there would be many pilots who experienced similar situations resulting in near-misses but have not reported them. These near-misses are important for identifying areas of weakness within our systems, but only with the use of new technologies are we becoming aware of how often these occur. My hope is that we will see a steady rise in near-miss reports submitted, however this is more likely to occur with a shift from Blame Culture to Just Culture environments in our workplaces.
Some thoughts on Navigation Safety in New Zealand pilotage waters

By Sharyn Forsyth

(Deputy Director Engagement, Communication and Coordination Maritime NZ)

Navigation incidents in New Zealand pilotage waters have recently come under increasing scrutiny from the Transport Accident Investigation Commission (TAIC). TAIC has put this issue on its watchlist and made recommendations about improving Bridge Resource Management (BRM) on ships. Similar measures are being taken in other jurisdictions world-wide.

If a port was closed due to an incident, there would probably be an immediate financial consequence as a result, not only for the Port Company itself, but also for the shipping company affected and other providers involved in servicing the port and visiting ships. There are also consequences for wider stakeholders including the pilotage provider, the New Zealand Maritime Pilots’ Association (NZMPA), the harbourmaster, the regional council and Maritime NZ as the regulator and national responder. Broader social costs would be borne by the port staff, their families, and the community around the port and by the companies that rely on the port to remain operational.

The potential wider economic costs of an incident could be considered as direct costs of failing to improve the pilotage system.

We would collectively share the impact so need to work together to address the issues raised by TAIC. A cohesive, multi-layered approach to the issues facing navigation safety in pilotage waters is appropriate as there is no single answer to this problem.

Maritime NZ, along with pilots and marine managers, have worked to develop and initiate such a multi-layered approach in this way over the past couple of years, and this work now needs to be re-focused and intensified. This engagement includes sharing information and working collaboratively with interested parties.

Maritime NZ has established a landing page on its website for Masters of ships visiting New Zealand. The page links to each port’s passage plan so that, in advance, they have access to the information they need for berth-to-berth passage-planning, as required by SOLAS V Reg 34.

Maritime NZ is soon to offer guidance on the maintenance and updating of skills for pilots. This work will be undertaken with input from pilots and marine managers.

Maritime NZ intends to initiate work later this year to consider options for addressing issues relating to navigation in pilotage waters, including whether regulatory settings need to change.

In the international arena, there are no accepted training standards for BRM. BRM is part of a deck officer’s STCW syllabus but as yet there has been no International Maritime Organization (IMO) model course to establish a common internationally agreed syllabus.

The Human Element, Training and Watch keeping (HTW) sub-committee of IMO’s Maritime Safety Committee will forward an agreed model course for approval in October this year. This model course should then establish a core common understanding internationally of what is meant by BRM and its practice. Maritime NZ is supportive of this initiative and is hopeful that this will lead to improved safety practices on ships’ bridges.

The NZMPA conference was a catalyst to initiate action to see how the professional association could play its part in a multi-layered approach to improving the pilotage system. The NZMPA has risen to meet that challenge.

Maritime NZ looks forward to re-engaging with the NZMPA to support its work over the coming year. Working together is very important if we are to improve safety standards in the industry.
PORT OTAGO
I’d like to talk about the imminent resurrection of a burgeoning, cohesive socialist proletariat to counter the populist media-driven increase in global fascism. However, much as it might be welcomed by this particular media outlet’s editor, it’s got nothing to do with pilotage so, I can’t.

But as the cruise ship season progresses in the Deep South around Puke-sicker Point, regime change is indeed subtly taking place. Within the Carnival Group of companies, those not operating at the Princess Cruises level of BRM intensity are gradually being brought to that standard; up to that standard or across to that standard is an interesting matter for debate. I should declare here and now to those not already aware, that I am an advocate of the Princess Cruises way of doing things, which is why I have been careful not to state that it is necessarily the best or ideal standard.

An advantage of being a pilot is that we work with whatever bridge regime is put in front of us, which is another reason why the TAIC listing of coastal pilotage is not and cannot be aimed solely at pilots. We are a service provider to the BRM regime that turns up at the pilot diamond and although we can do our bit to influence the quality of what turns up over the long term, we cannot dictate what it will be; that is the job of the regulators, operators, global trade trends and machinations and ultimately Joe Public.

Observing the different cruise ship BRM regimes reveals an interesting mix of philosophies, practices and human behavioural factors. Some examples: Taking a look at my BRM practice alma mater Princess Cruises, we can see a regime that comes across as a super-efficient, rhythmically-interactive practice, diligently macro and micro-covering all aspects of bridge operations. It’s great when it works; shit when it doesn’t. I have witnessed the latter in the military version during work-up training for RFA and NATO navy warships in the UK. If the whole thing goes off at half-cock then, the danger of people slipping into robotic conformity before superficially-efficiently and closed-loopedly running up on the rocks is very real. The trick of course is to constantly monitor performance and keep the standard way up there such that this doesn’t happen. It’s a big ask.

Other regimes rely less on such strict practices and more on natural human behaviour to correct anomalies as they arise. These regimes seem to utilise the perceived and natural professional competence rightly expected of trained professional mariners. This method has less in the way of continuous intra-team checking, so is more liable to allowing an error to materialise but is arguably less constrained and therefore more free-thinking in nature and able to correct mistakes with the required action immediately and without such deep reliance on, and referral to, complex procedure. It’s easier to work with if the right fully-trained team is assembled but still more open to error, I would suggest, than a proper swept-up Princess Cruises team.

Still others choose, theoretically at least, to reduce one-man error by half. This is achieved by having two professionals, of which the Master is one and the pilot is the other, interacting and working together in the more intense areas of close-quarters navigation that we call pilotage waters. It seems to work well but if neither of the professional operatives pick up an error then it is far less likely that anyone else in the team, with their inherent lack of involvement, will pick up on it either unless it is glaringly obvious, and thus more likely that the two wise men will pick it up anyway.
Participants in all these regimes need to be happy in their work, which is not a glib phrase. Contentment in life is a desirable human condition and we tend to operate better when we are happy and content. The Princess Cruises top-end regime needs its participants to understand the value of all the tasks that they are allocated because they will think about the value of what they are doing at any given time, thus needing to feel that they are worth doing and that there are no pointless tasks allocated to team members; they need to be happy. The other regimes may be happy but ignorant of tasks like closed-link communications and thinking-aloud, that are not required to be done under their auspices, but this may not be a good thing.

So, if Carnival are going to influence regime change and have the Princess Cruises methodology dominate, then they will need to keep the proletariat contented to avoid resistance to their prosecution of the Revolution. Meanwhile pilots, still integrated to a greater or lesser extent, will be able to observe with objective interest how it all pans out and enjoy the diversity of practice, which so many are trying to suppress at the top end of the industry, whilst at the same time sloping off to the next job on one of the other 95% of ships which don’t do this stuff anyway. Viva diversitas! Surely that’s why we do it?

(Craig Holmes)

GISBORNE

The tug Waimata is up for her first 5-yearly docking and the slipway in Whangarei is booked for 11th March; we have chartered Daldy from Ports of Auckland as cover in Waimata’s absence. Having a Voith in the Port for a couple of weeks will be a luxury, and having one of the grand old girls of the towage industry briefly at our disposal can only be described as a privilege – the only downside is the Apple-Dome which encloses what was once the open flying-bridge.

Gisborne District Council (GDC) has recently appointed a full time Harbour Master. Salvatore (Sonny) Ali is a North American expat. who has spent the past 2 years as a MNZ MSI in Tauranga. Sonny has a background in sea-going and shore-based marine industries in the ‘States’. We are currently working with Sonny to align the respective EPL & GDC SMS documents.

Wayne Larsen recently joined the EPL Marine Team as Marine Engineering Manager. Wayne was most recently in a similar role with Port of Napier and his industry experience stretches back to his Otago Harbour Board apprenticeship in the ‘70’s. Bringing someone of Wayne’s experience on board at a time of fleet renewal (replacement of the tug Titirangi and the dredge Pukunui), while also nursing along 40 & 50-year old floating plant is a real bonus for us. We are also looking to recruit an experienced tug master at this time.

Log volumes continue to track last year’s volumes with obvious challenges in the logging sector. Availability of machinery, trucks, and skilled logging crews continues to be a challenge. Consequently we experienced a ship free period of the best part of 2 weeks after Christmas which is highly unusual. Back to normal now, with vessels queueing in the anchorages and the reefer boats arriving for seasonal squash shipments.

As much as I try to focus my contributions to Ports of Call on the operational side of the business, I will take the opportunity to comment very briefly on the recent NZMPA conference in Wellington and Craig Holmes’ contribution to Volume 27, No. 4. Craig is dead right to question the relevancy of BRM (as we currently understand the concept). The Wellington conference was littered with admonishment that navigating well-marked channels and berthing ships without incident is simply not good enough anymore and rather, one should be following a red line on a PPU. Further; the ship’s bridge team must also subscribe to the same red line mantra. This of course begs the question as to whether ports should continue to fund ATON infrastructure but let’s not go there just at this stage.

Early BRM theory, circa mid 90’s, was a very poignant and welcome education tool for the pilotage industry. The concepts around working constructively with diverse personalities and cultures were highly relevant. We had dolphins and bears and all manner of other animals and we were going to agree a plan with the Master and his bridge team as to the planned passage – the elusive shared mental model.

The ensuing couple of decades however has seen the concept of BRM stretched to become the apologist for all manner of questionable conduct in pilotage waters, whilst communication, navigation and seamanship skills across vast swathes of the international shipping industry have deteriorated significantly. Referring once again to the
theme of Craig’s previous piece; it is absurd to suggest that after walking onto the bridge of a ship on which there is no English language comprehension and the ship’s complement are not able to complete even the most basic of functions (such as turning-up the dimmer on the bridge-wing helm & engine indicators) that a Pilot is going to somehow whip the same bridge team into being a switched-on and functioning navigating unit following a shared mental model.

One recurring theme from the conference was the rallying cry that we have been practicing BRM and all its consequent manifestations for 2 decades or more and accidents/incidents continue to occur, even to the point of exasperation at which TAIC has placed navigation in pilotage waters on the Watchlist. Analogies were abundant, such as Albert Einstein’s: ‘the definition of insanity is doing the same thing over and over again but expecting different results.’

In response to all that let’s turn the conference theme on its head and pose the contrary question: if we’ve been practicing BRM and all its consequent manifestations for 2 decades or more and accidents & incidents continue to occur then is BRM the appropriate course to follow, (or red line if you prefer)? What say you Albert? (Chris Kaye)

TAURANGA
Greetings from the hot dry Bay of Plenty. We have a new trainee pilot in our ranks to allow for future staff turnover and new 4-man roster which will start in October and reflect the increasing shipping numbers and the dreaded shift-ships. Donyin Lin joined us recently, having been in the offshore for the last few years after serving with various Carnival Cruise ships.

Last week we had a serious incident when Lars Sorenson was boarding a log ship: about halfway up the ship’s side, the rope on one side of the ladder parted, leaving Lars dangling precariously on the good side of the ladder. The launch was immediately back alongside, and Lars descended safely with the aid of the deck hand. The ship was sent to anchor to await the delivery of a new ladder later in the day. The cause of the break is still unknown, but the break was not a simple cut and it is thought it may have been due to chemicals being used in deck-washing. I should have more info in the next issue.

AUCKLAND
It’s been a fairly steady summer, the weather has been great and everything has been ticking along nicely here, which is probably one of the reasons we have become a magnet for invasive pests, running the full gamut from marauding Gypsy lager louts to two different types of fruit fly, and our old mates the Marmorated stink bug, although to be fair to the latter, the Japanese arm of the family have stayed away this year but one vessel originating from Belgium had to be treated for them. I’m not that familiar with Belgium, and generally just associate the place with Chocolatiers and dodgy basements, but it seems now to have become the go-to place for these very costly invaders, and resulted in this particular vessel having to discharge vehicles at the astonishing rate of 8 per day.

We’ve had a bit of a re-shuffle in the roster, with Matt Dundas moving into Cherag’s vacated slot and Holly Wells taking over Matt’s role as Marine Officer. Holly is currently finishing up her Tug training, and will then start Pilot training in the next few months.

Our electronic MPX is now being fully utilised by all. This is due to the indefatigable efforts of John Barker, who has just rolled out version 6, which has ironed out the earlier glitches, and it works well. It would be fair to say I may
have been one of the earlier sceptics who clung to the idiom *If it aint broke don’t fix it*, and yet I am also mindful of a cartoon I saw recently, depicting two Caterpillars looking skyward as a large Butterfly flies overhead with one Caterpillar saying to the other “Blimey you’ll never get me going up in one of those things”. A couple of years back I may have been more inclined to believe in talking Caterpillars, than I would a fully functioning paperless electronic MPX, but the technology is here, its constantly improving and it’s not going away…Who’d have thought?  

*(Craig Colven)*

**LYTTELTON**

We were all pleased to hear that the Company has employed another Pilot with the announcement that George Hadley will be starting in April. He comes to us from Brisbane where he has been for the last eight years, before that he was in Timaru. The Company searched far and wide covering several continents but in the end employed someone who lives fifteen minutes from the port. This is our version of “Think globally, act locally”.

Richard Hill has completed his tug training and has had a couple of months in the roster consolidating his skills. He has now started Pilot training and when he is licensed he will be able to provide relief in the roster and allow John Rendle to finally retire.

We will soon be having a visit from Kees Buckens from the Auckland Navigation School to carry out some External Peer Reviews. With the extended channel, DUKC and updated Procedures, it will be good to have an outside eye cast over what we are doing.

What we call our Cruise Season has finished for the year. We had about a dozen visits with a couple cancelled due to wind forecasts exceeding berthing limits. More of a taster than a main course, but enough to remind us what is expected of the Pilot on these vessels. I struggle to understand why they need the Pilot on board half an hour before sailing when it takes five minutes to bring in the gangway and five minutes for the Master to tell you how he is going to do the job. With the new Cruise Berth taking bookings from November 2020 this is something we will have to get used to.

*(Finlay Laird)*

**WELLINGTON**

Much of what we have experienced over the last quarter, with respect to erratic weather and ever increasing numbers of cruise and log ships calls, will be mirrored in almost every other NZ port.

I suppose for our marine team, the most visible change we will see over coming months is the deconstruction and demolition of our briefly iconic waterfront structure, CentrePort’s now infamous BNZ Building. Situated between our floating plant and the BlueBridge ferry operation, this building was opened to much fanfare a mere 10 years ago. It subsequently attracted attention for its radical and innovative design; however, it didn’t have the hidden benefits of base-isolators as found under The Beehive and Parliament Building, Te Papa and the new Wellington Hospital. Severe earthquake damage during the 2016 Kaikoura Earthquake inflicted immense damage which wasn’t readily apparent from the exterior. Whilst many saw what appeared to be an intact building, engineers found damage to the floors that would not be cost-effective to repair. Sadly it was announced last month that we would lose this landmark next to our tug berth over coming months.

With the parting of the BNZ Building however, we will not see another building rise from the ashes, but we will see major redevelopment of ferry operations on the site. There are numerous discussions going on around various tables, with Interisland Line looking at replacement tonnage for their aging fleet, which may see a pair of much larger vessels replacing *Kaitaki*, *Kaiarahai* and *Aratere*. With these plans we may also see the development of a ferry hub for both companies in the area of the current rail ferry terminal. Watch this space.

We were fortunate last month to meet Mark Hayden, a software researcher/developer from California who is involved with SEAiq software, which many of you may have already encountered. This is being trialled in Wellington and I understand has now become the software of choice ahead of Qastor for Navicom. I look forward my own opportunity to try it out, once Lew has sorted out any teething problems of course. As a self-confessed technophobe, I definitely won’t be leading this trial.  

*(Steve Banks)*
How best to train our Pilots?

Adam Eager

All pilotage providers have a Pilot Training Plan, which is heavily focused on the individual requirements of the port in question. While this suits to meet the regulators’ approval, does it make for the best pilot training? Or should we also look outward for the best that is available, nationally and abroad?

I have 10 years’ experience piloting in NZ and feel I have lots more to learn, and there are pilots with vastly more experience than me. So how do I tap into that knowledge? How can I make that knowledge part of my CPD before it is lost.

What I have come to realise, with our most senior pilots retiring, is that there is a wealth of knowledge that retires with them. Those that remain are tasked with training-up the next generation, and I want to ensure that the training I provide is to the industry’s best practice. Is there a way to capture and share our knowledge and lessons learned? Can we create a reservoir of knowledge that is peer-reviewed and accessible to all NZ pilots, a Wikipilot or better still, Waka Matauranga? I digress.

Using a robust framework, similar to one outlined by the UK’s National Occupational Standards for Marine Pilotage, the NZPMA members could populate the criteria, individualising content where necessary for each port, but maintaining it as open source to allow maximum learning and development.

We have around 80 Marine pilots in NZ. There are some ports in the world that have more pilots on one shift, so it is not inconceivable to have a unified training guide based on the principles of hydrodynamics and ship handling, while maintaining industry best practice with our CPD, BRM, Passage Planning, emergency response training, etc.

We are the guardians of New Zealand’s marine gateways to the World and we need to make sure we are doing our best to keep them safe and open

“I don’t get it...After all the budget cuts to streamline the work force, why aren’t we moving any faster?”
Maximising Situation Awareness in Maritime Pilotage

(Peter Dann, Deputy President AMPI)

Situation Awareness: What is it and how is it attained?

Situation Awareness (SA) is a very complex subject and there is still a great deal of debate over what SA actually is. This debate has led to SA being defined in many ways but perhaps the one that is used the most is Endsley’s (1995) definition where Situation Awareness is:

- Perception of elements in the environment within a volume of time and space,
- The comprehension of their meaning and
- The projection of their status into the near future.

Situational Awareness then is simply having an accurate understanding of what is happening around you and what is likely to happen in the near future and to build this awareness, three processes are required. These are:

**Level 1 – Perception** – The senses must be used to scan the environment thus building a mental picture of the environment, once this is achieved our attention must be directed to the most important and relevant aspects of our surroundings which in turn compare what is sensed with experience and knowledge in our memory.

To do this requires discipline as well as knowing what to look for, when to look for it and why.

**Level 2 – Understanding:** Understanding and creating a mental model is built by combining observations from the real world with knowledge and experience recalled from memory. If this is successfully matched an accurate mental model of the environment has been formed. This mental model is continually updated via inputs from the real world by paying attention to a wide range of information.

**Level 3 – Projection:** By gaining understanding, the ability to think ahead is enabled and this is critical as it helps in the decision-making process. Doing this also ensures that our understanding, based on careful data gathering, is as accurate as possible. It is simply piloting ahead of the vessel.

Understand
Create mental model

Think ahead
Update the model

Gaining and Maintaining Situational Awareness (Airbus, 2007)
Maximising and Maintaining Situation Awareness

To fully maximise and maintain SA the following main components of SA (adapted from the airline industry) need to be used. These components are:

- **Environmental Awareness:** An awareness of what is going on around you in regard to other vessels, communications between VTS and other vessels, weather, tide and currents, etc.
- **Mode Awareness:** An awareness of what configuration the ship’s control systems are operating in i.e. Track mode, ECDIS mode, PPU mode – normal or docking.
- **Spatial Orientation:** An awareness of where the vessel is geographically within the operational location.
- **System Awareness:** An awareness of the ship systems being used i.e. bridge control or engine room control.
- **Time Horizon:** An awareness of time with respect to when required procedures or events such as Wheel-over points will occur.

In dealing within a marine pilotage context (and for the sake of simplicity) the terms Environmental Awareness and Spatial Orientation could be termed as Visual Awareness, whilst Mode Awareness and System Awareness could be termed as Instrumentation Awareness.

Time horizon is represented in both types of awareness, as maximum awareness will always give you more time to make more effective decisions. If one or the other is out of kilter, then time constraints are introduced which in turn brings about poorer decisions.

Failure to Maximise Situational Awareness

The grounding of the *CMA CGM Vasco de Gama* (VDG) is a good example of the dangers of not maximising SA. The report indicates that the pilots (as well as the Bridge Team) were not fully utilising the electronic navigation aids onboard (Marine Accident Investigation Branch, 2017, p. 1) so it is possible that all on the bridge were operating under what could be termed Visual SA and neglecting the SA that instrumentation brings.

In regard to the incident itself, it is apparent through reading the Incident Report that when the lead pilot asked “where is all this tide when you want it” (Marine Accident Investigation Branch, 2017, p. 10) that he had lost environmental awareness at some stage shortly before commencing the turn. In other words, the lead pilot had used an incorrect perception and comprehension at that particular point in time (when starting the turn) to come up with the wrong projection.

As the lead pilot was relying on his mental model alone and hadn’t been using the ships bridge team, instrumentation or even the assistant pilot to help him, it is understandable that stress then became a factor in his decision-making. This is evident in his insistence “that they must keep going” when the turn was not going according to plan.

Examples of the use of SA occurring in the *CMA CGM Vasco de Gama* grounding incident are shown below. To help further illustrate this, the views of the VDG Pilots, VDG Bridge Team and the VTS were developed from the MAIB Investigation Report (due to size constraints only parts of the views are shown, the full views however are available on request). A couple of interesting asides from the development of these views is that the VDG Pilots and VDG Bridge Teams views appear to be disorganised which could point to a disorganised SA state and also that there appears to be no inclusion of the lookout in the VDG Bridge Team.
Example 1:
When the pilots were discussing the leeway that the ship was making (Level 1 & 2 SA) and the relative positioning of the other large container vessel within the channel (Level 3 SA). Unfortunately, the investigation report does not make clear what means were used to gain this information.

Example 2:
When the lead pilot informed the master of his planned manoeuvre into the Precautionary Area in order to round Bramble Bank. All three levels of SA were at play as the lead pilot intended to combat the strong flood tide and prevailing headwind by navigating the vessel deep into the Precautionary Area before commencing the turn into the Thorn Channel.

Example 3:
When the VTS officer called the pilots and advised them that the vessel appeared to be leaving the channel (Level 1 SA - Perception) and then alerted the local tug masters (Level 2 SA - Comprehension) and placed them on standby to provide rapid assistance if necessary (Level 3 SA - Projection). This is a good example of purely instrument SA at play.

Rethinking the Marine Pilot Training Paradigm
As can be seen from the CMA CGM Vasco de Gama grounding as well as in many other recent incidents, piloting by visual means alone can bring with it unintended and serious consequences; whilst visual piloting remains deeply entrenched in our way of learning piloting, this will always be so. To help combat these unintended consequences, pilot training
needs to include instrumentation training so that it is possible to use visual and instrument SA in tandem not as separate entities. To do this will require a re-think of how pilots are trained, which will in turn change perceptions to better include using instrumentation in pilotage. Possible ways of doing this are by:

**Improving and refining BRM and MPX practices**

There is continuing work being conducted in refining areas of BRM for pilots as evidenced by the Recommendations on Bridge Resource Management courses for Maritime Pilots that were recently released by IMPA (2019) as well the MPX which the article *Sharing Mental Models* in confined waters (*Di Lieto, Hederstrom, Listrup, & Nijjer, 2018*) recently discussed. To further the effectiveness of the MPX, there is a need to learn how to make a good presentation and be a good communicator, as the MPX is only as good as the person presenting it. People sometimes just assume that this is going to happen. Possibly the introverts amongst us need to tone-up our MPX’s and the extroverts tone theirs down.

**The use of SA in pilotage passage planning**

The perception, understanding and projection levels of SA could be used to assist in pilotage passage planning and to aid in the creation and use of the MPX where at:

- **Level 1** – The pilot gathers pilotage information for the MPX. This includes available routes, available water, UKC, planned route, vessels concurrence with plan, define critical navigational elements i.e. cross track distances, speeds, ROT, drift angles, etc
- **Level 2** – The pilot ensures that the pilotage information for the MPX is understood. This includes what are acceptable/not acceptable deviations from the plan, vessel capabilities, timelines for passage to berth, passing critical areas, allowable set/leeway, understanding the weather forecast and what effect this will have on the pilotage, etc
- **Level 3** – The pilot project the above to give predictions on what to expect from weather, tide, sea state, project times to tugs, berth etc. By being able to do this it will be possible keep the pilotage ahead of the ship

**Maximising SA Through the PPU**

The use of portable pilotage units (PPU) is also a further way to assist in increasing situational awareness. This was discussed in the *Aqua Diva* near-grounding Report (2018) where it was stated that the PPUs carried by the Newcastle Pilots “provided real-time automated positioning information which vastly enhanced situational awareness through the display of past tracks and predicted ship path on a chart familiar to pilots” (Australian Transport Safety Bureau, 2018, p. 8).

The MAIB also found this in the *CMA CDM Vasco de Gama* grounding where it was found that portable pilotage units were carried but were not effectively used to assist the master/pilot exchange and provide additional situational awareness” (Australian Transport Safety Bureau, 2018, p. 14).

The ATSB in the *Aqua Diva* report also discussed the use that could be made of the PPUs “as a communication tool, to assist in explaining the pilot’s passage plan and intended actions into and through the turn. In this way it could have assisted in building a shared mental model and clarifying the differences between the pilot’s and the ship’s passage plans” (Australian Transport Safety Bureau, 2018, p. 12).

The use of the PPU as an information, teaching and communication tool for use with the ship’s master and crew therefore cannot be underestimated as they are especially useful for developing expectations and explaining impending manoeuvres such as turns and course changes.
PPUs and Passage Planning

Besides the use of PPU’s to aid in passage planning, it is also possible to use PPU’s to increase SA in BRM as shown in the example below:

- Ship A is approaching Ship B which is constrained by her draft
- Ship A intends to leave the planned corridor by an alteration of course to starboard to give ship B sufficient room to pass.
- As the reserve has been marked on the PPU, the pilot is able to indicate to the bridge team what needs to happen, why it is happening and when an alert needs to be raised that the vessel is approaching the no go area.
- As Levels 1, 2 and 3 SA have been attained then so has a shared mental model.

![Diagram of PPUs and Passage Planning](image)

Adapted from (Di Lieto et al., 2018)

- The pilotage passage plan is integral to PPU piloting
- The pilotage passage plan is integral to gaining a shared mental model
- Effective BRM is founded on shared mental models

The Stabilized Approach

Use could also be made of the stabilized approach concept that the aviation industry uses. The stabilized approach is a concept that focusses on “establishing and maintaining a stabilized approach and is a great way to avoid experiencing a loss of control. A stabilized approach is one in which the pilot establishes and maintains a constant angle glidepath towards a predetermined point on the landing runway. It is based on the pilot’s judgment of certain visual clues and depends on the maintenance of a constant final descent airspeed and configuration” (Federal Aviation Administration Safety Team, 2016, p. 1). The adage to this method is to remember that if not stabilized – then go around.

This method uses not only visual cues but instrumentation cues when operating in Instrument Meteorological Conditions to ensure that the aircraft is on the correct flight path (Flight Safety Foundation, 2009)
Looking to The Future

In conclusion what is needed is a “training model that aligns not only with the visual senses, but the technology as well. This will drive performance, and anything that improves performance gives you an edge.” (Chanticleer, 2018, p. 48). To do this will not be easy as it will require a re-think in how we not only train as pilots but train new pilots as well. The introduction of an instrument piloting rating similar to that used in the airline industry could be considered.

Ships are becoming more technologically-driven and ship designers are also not making things easier by designing ships that may be within the rules for visibility purposes, but make it harder to use visual cues e.g. approaching wheel over points. This necessarily drives a change to using instrumentation cues, and if we as pilots are to stay out of trouble and off the radar, then we must learn to use instrumentation cues in tandem with visual cues to derive a better outcome.

Maximum SA is only gained by a proper combination of visual and instrumentation SA and this is critical if the pilot is to make effective decisions, revise plans and pilot the ship. It follows then that if maximum SA is gained then the pilot will be better prepared to deal with upcoming events and able to pilot ahead of the ship.

References


Chanticleer. (2018). Westpac executive George Frazis says banks have a lot to learn from airlines. Australian Financial Review.


EXPLORING THE PERCEPTION OF RISK\textsuperscript{1} IN CRUISING

Jennifer Holland, PhD Candidate, University of Brighton, UK

The events of the \textit{Costa Concordia} reflect risk in cruising. There have been many risk events affecting cruise ships in the past 25 years, including 4 sinkings, 48 fires, 61 collisions with other ships or piers, 57 groundings and also severe listings, tender accidents and breaking free of mooring lines. There has also been recent attention to the dangers of more remote itineraries such as the Arctic or Antarctica. Polar cruising is especially risky due to the increased difficulty in rescue, navigational charts not existing or being obsolete, impacts of climate change including increased ice hazards, and cruise ships sailing without the correct level of ice-strengthened hull. Additionally, many cruise ships are being used beyond their service-life, suggesting a higher potential for mechanical failure. The ships are also getting larger, and in 2018, there were 24 cruise ships in operation that carry over 4000 passengers, including 3 ships carrying 6300 passengers, and 4 ships carrying 5500.

My PhD set out to explore risk perceptions in ocean cruising, and how this may influence people's decision whether to go on a cruise or not. Findings revealed how the perception of risk is far more complicated and multi-dimensional than previously thought. The perception of risk, whether real or imagined, has the power to change travel decisions. This is significant for the cruise industry in order to continue the robust growth of recent years through finding ways of attracting new cruisers and also retaining current cruisers. Recent industry figures indicate shipyards are operating at full capacity, with construction commencing on a new cruise ship every 47 days.

This study found evidence that risk in cruising is much more than just health and safety. Findings revealed the participants overwhelmingly view a cruise as a 'safe' holiday and placed significant trust in the cruise companies and officers to look after them. Interestingly, these cruisers felt safer with British officers on-board, which highlights the role of heuristics\textsuperscript{2} in decision-making. When dealing with uncertainty (risk) in decision-making, people rely on a number of heuristic principles to reduce the complex task of assessing probabilities and predicting outcomes. Heuristics are quick mental short-cuts people use intuitively when making decisions, and we probably don't even realize we are making quick assessments and

\textsuperscript{1} The origins of the English word “Risk” date back thousands of years. The ancient Greeks defined “Rhizikon” as a seafaring term – a rock or other danger to be avoided. There is a similar Latin word – “Riscus” – with the same meaning. By some accounts, this word passed into Arabic as “Rizk” with a meaning similar to “Fate” or the uncertain outcome of work and toil. From there it hopped the Mediterranean again to Europe in the 1500s, as “Rysigo” (German), “risco” (Italian) and “risquer” (French). In all cases it essentially meant “Danger”.

\textsuperscript{2} Heuristics were developed in psychology by Kahneman & Tversky and are quick mental shortcuts or cognitive processes. They help us reduce complex decision-making to quick shortcuts, based on what we already know or have experienced. This is due to our limited time to make rapid decisions and our brain seeking to reduce the cognitive effort. Research shows our brains use “dual-process” thinking to help us make decisions. The first process is heuristic; with quick, intuitive, automatic decisions, and the second process is systematic; with slower, complex reasoning and deliberate thought. So when making a quick decision, we may unconsciously be using heuristics, which may explain why we make decisions based on feelings or bias, when if we stopped and rationally or deliberately thought about a decision the outcome may be different.
judgments based on our previous experience and acquired information. In assessing risk on a
cruise, these participants point to how in a quick judgement, they felt safest and most
comfortable with what was familiar and known to them. Heuristics may be of particular
significance for cruise tourism, as recent studies suggest a heightened awareness of recent
negative cruise events such as the *Costa Concordia*. Studies conducted after the *Concordia*
showed an initial and immediate decrease in booking, but once the event became a more
distant memory (after about 90 days), cruise booking levels resumed. Heuristics highlight the
significance of emotion and affect on perceived risk and its impact on decision-making.
Other examples of physical risks in cruising that came up during the study were worries
about Norovirus, fires, sinking and being unable to escape. Interestingly, worries about crime
and terrorism did not emerge as a concern for any of the participants.

Other types of risk that came up were related to time and money. Cruisers see a cruise as
great value, and non-cruisers see cruises as expensive and worry about the lost opportunity to
have chosen a different holiday. Financial risk can also be seen in the collapse of *Swan
Hellenic, EasyCruise* and *Ocean Village*, which affected thousands of passengers who had
their bookings cancelled and had to scramble to find alternative holiday arrangements and
seek refunds. A potential cruiser needs to choose from a bewildering 62 different cruise
brands, complex pricing structures, type of cabin, travel to and from the ship (which may
include international travel), and then consider shore tours, dining, social expectations and
dress codes.

Equipment risk is also significant. A cancelled or altered voyage due to mechanical issues has
a negative effect not only on passengers and cruise lines, but also on companies providing
services such as hotels, airlines, ground transportation, shore excursions and port services.
Cancelled voyages can result in cruise companies paying out thousands or millions of dollars
in compensation. An example was the loss of power after a major fire on-board the *Carnival
Triumph* in 2013 (forever known as "the poo cruise"). While the engine room fire was
quickly extinguished, the loss of power caused the ship to lose propulsion, adrift in the Gulf
of Mexico with 3,143 passengers on-board. No injuries were reported, but passengers were
subjected to deteriorating conditions for four days as the ship was towed back to port, with no
functioning toilets, no air-conditioning, limited food service and raw sewage backing up into
cabins and corridors, including passengers being asked to place their human waste into
plastic bags.

However, this PhD study found overwhelmingly that worries about physical safety and other
risks did not influence their decision to go or not to go on a cruise as much as risks related to
social and psychological aspects. Holiday decisions are shaped and influenced by how we
see ourselves, and we want to choose holidays that reflect who we think we are and how we
see ourselves. Much more needs to be researched, but this study is the first to explore risk in
cruising and reflects how choosing a cruise for a holiday is truly navigating uncertainty.
“The evil that men do lives after them, The good is oft inter’d within their bones.” That's one way to start isn't it, but in Cook's case it misses the point rather badly. Because his bones were not properly interred, they were carried around for over forty years in a reliquary bundle at Hawaii (at the carnival time of the god Lono, the time of the god's harvest festival) as a sign that the god had returned, and a sign perhaps too that the god was now an Englishman. In Cook's case, both the good and evil aspects of his astounding achievements have been keenly debated since his death. Cook's three Pacific voyages had immense consequences because they changed the world so radically that their good and evil consequences continue to be debated e.g. is modern industrial society a blessing or a curse? We enjoy the benefits even as we become increasingly apprehensive as to the costs. Cook was unquestionably a great formative agent in the creation of the modern world.

Amidst the collapse of the colonial empires, it is highly important that Cook and his achievements be seen and judged in a less Eurocentric fashion e.g. Cook discovered little in the way of new lands, that wherever he came he found people already settled for centuries, that his discoveries could even be described as a useful eighteenth-century English legal fiction. The peoples he encountered in the Pacific provided him, through trading, with the provisions essential for the successful prosecution of his ventures.

The discovery of the world is really a subject for pre-historians. Cook was not a discoverer of new lands in any fundamental sense. He was the highly successful and highly efficient leader of three scientific research teams, a communications man, instrumental in bringing a mixed bag of goods, ironware and syphilis, written language and centralised government, and much more, to the Pacific.

Cook helped to make the world one world - not an harmonious world as the men of the Enlightenment had so rashly hoped, but at least a more interdependent world. His ships began the process of making the world a global village.

Nor must Cook be viewed as an innocent agent of history. Already by the Second Voyage he was well aware that he was bringing evils as well as benefits to the Pacific. He became aware how the Polynesian desire for iron tools and nails, for example, was beginning to break down their traditional moral values - he grasped the connection between trading and syphilis.

He did what he could to minimise such evils but, as he knew, it was beyond him. Sometimes he could behave with great brutality - as when his boats were at risk, sometimes, as in the annexation of New Zealand and Australia, his desire for patriotic achievement may have exceeded his instructions.

Yet when his actions in the Pacific are assessed in both human and moral terms it can still be said that he behaved better than any who came from Europe before him and better than most who came after him to convert, trade and conquer; he was the leader of remarkably able and successful scientific teams. For it was these men who provided Europe with its first intellectual and visual conceptions of the Pacific world. Furthermore it was these artists and scientists who were the first to realise that the problems and the significance of culture-contact would in the end become of greater importance than the imperial ambitions of possession and occupancy.

Cook’s voyages posed sharply the problems of living in a multi-cultural world. He did what he could to face the daunting problems of living in such a world. Today we are still learning to face the kinds of problems he had to face daily in the Pacific.

(N.B. These two complementary articles were first published in Offguardian.org on 10th March 2018)
Professor Smith (p.20) quoted Shakespeare’s eulogy for Julius Caesar which represents the ultimate challenge to historians i.e. to see beyond the constraints of our own cultural and political prejudices, using different lenses (and mirrors) to examine the Human Condition, past and present. The advent of BRM allows us to think about hierarchies intrinsic to notions of culture, race and political systems. Psychological insights benefit all professions, and are equally applicable to historical analysis.

Though the god (above) may have been an Englishman, his father was Scottish - a farm labourer in Yorkshire (thus Cook balanced a chip on each shoulder). The father’s employer paid for Cook’s primary education, but thereafter, Cook was an autodidact, determined to better himself despite the obstacles of class and wealth. By diligent perseverance, Cook rose in the hierarchies of firstly the Mercantile, then Royal Navies - though only commissioned an officer for his Pacific command. Cook cared for his men, as evidenced by no deaths from scurvy, the plague of seafaring: he ‘tricked’ his crew into eating the anti-scorbutic Sauerkraut by saying it was reserved for the officers and gentlemen i.e. too good for sailors.

In general, Cook respected other cultures and their hierarchies; however, his hasty temper, petty materialism and cultural insensitivity led to his violent end. In Moorea, for the theft of a goat, Cook burned houses, destroyed canoes took prisoners (some flogged, some ears cut off). His attempt to take a Hawaiian king hostage against the return of one of the ship’s boats, led to the fatal confrontation on Kealakukea beach (14th Feb 1779). Cook’s ships fired cannons, killing 30 Hawaiians. The more lasting damage to the Hawaiians was syphilis from subsequent European contact which (according to travel writer, G.W. Bates’ 1854 estimate) reduced the population from 500,000 in 1779 to 90,000. Leprosy gained a foothold in the 1830’s. US businessmen established sugar plantations, then overthrew Queen Lili‘uokalani in a Coup d’Etat in 1893. Incredibly, this precisely identical operation is current in Venezuela e.g. the US and its vassals’ over-hasty recognition of an unelected ‘President’.

Cook’s ‘discovery’ of Australia gave Britain a dumping ground for unwanted petty criminals (i.e. poor unemployed). Just as the abused becomes the abuser, those first settlers looked down upon the Aboriginal population (who had preceded them by some 65,000 years) and wiped-out the Tasmanian aborigine. When sugar plantations required cheap labour, aborigines were duly enslaved and people-trafficking (“Blackbirding”) also became a profitable business throughout the Pacific. The same notions of racial superiority and entitlement which permitted such atrocities still drives current Australian Foreign Policy to imprison refugees from Western Wars in offshore concentration camps, in blatant disregard for international law. Pacific Islands have suffered the worst of colonial exploitation and their subsequent use as military bases or nuclear weapons testing grounds remains an abomination, with a toxic potential to trigger WWIII.

Robert Burns’ (1784) wrote of “Man’s Inhumanity to Man” some 2 years before he almost embarked for a position on a slave plantation in Jamaica. Abraham Lincoln’s First Inaugural address (1861) appealed to “the better angels in our Nature”. Robert Louis Stevenson’s (1885) “Jekyll & Hyde” considered man’s dual nature, likewise mined in Oscar Wilde’s (1890) “Portrait of Dorian Gray”. As thinking individuals, we can transcend our reptilean-brained non-thinking ideologies - like heuristics (p. 10) - and see the good in others, as well as seeing ourselves as other see us (Burns “To a Louse”).

The History of Hawaii since Captain Cook’s demise tells us much about Humanity: say “Aloha” to US Congresswoman Tulsi Gabbard, now running for US President in 2020. Like most war veterans, her understanding of the true costs of war drives her pacifism; she is reviled by the mainstream media, possessed by the masters of war, the darkest part of Human nature. As a young Congressman, JFK once wrote: “Wars will continue until that distant day when the Conscientious Objector is revered as much as the warrior is today.”
Port Ash Australia utilises manned ship models to provide real feel, real world training on its purpose built 2 Ha (5 acre) lake, and employs experienced Marine Pilots to provide world class training.

Providing specialised training for:

☑ Masters
☑ Officers
☑ Marine Pilots
☑ Naval Officers
WORLD CLASS
PORTABLE PILOT UNITS

WHATEVER THE CONDITIONS, WHATEVER YOUR POSITION, WE PROVIDE AN INTEGRATED SOLUTION.

Navicom Dynamics Portable Pilot Units are now present in over 40 countries including Europe, Asia, Australia and the Middle East. They are used by marine and harbour pilots, docking pilots, mooring masters, port authorities and also within the offshore oil and gas industry.

The use of PPU’s provides superior benefits such as increase in work efficiency and safety of the work environment, quicker turn-around times and improved situational awareness.

We have a wide range of PPU’s suitable for almost every pilotage.

Get in touch with us today to discuss which PPU is best suited for you.
THE ORC PILOT BOAT

As used by:
Port Phillip Sea Pilots
Mid West Ports
Flinders Ports
Svitzer
Rio Tinto
Esperance Port Authority
The Port Authority of NSW - Port Kembla
Port of Townsville
Gladstone Ports Authority
Tasmanian Ports Corporation
Lyttelton Ports Corporation
PrimePort - NZ

Mal Hart 66 Yuilles Road
Mornington Victoria 3931 Australia
E: contact@hartmarine.com.au
P: 61 3 5975 5622
F: 61 3 5975 9634

www.hartmarine.com.au