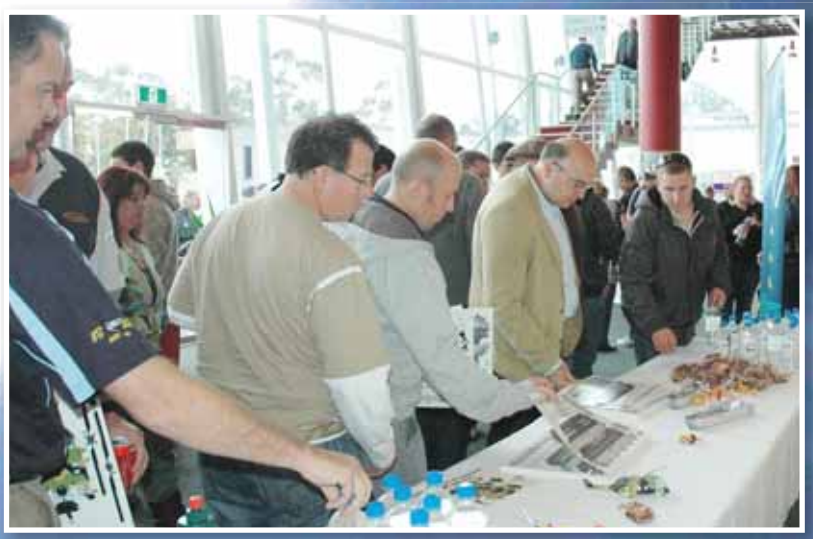
NOVEMBER 2010

TOUCHDOWN

THE FLEET AIR ARM SAFETY AND INFORMATION MAGAZINE

NAVY



FLEET AVIATION SAFETY STAND DOWN DAY

05 NOVEMBER 2010

FLEET AIR ARM SAFETY CELL

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Simulator Complex
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TOUCHDOWN is produced in the interests of promoting aviation safety in the RAN, under the direction of Commander Fleet Air Arm. The contents do not necessarily reflect Service policy and, unless stated otherwise, should not be construed as Orders, Instructions or Directives. All photographs and graphics are for illustrative purposes only and do not represent actual incident aircraft, unless specifically stated.

Deadlines
Issue 1/2011 contributions are requested by 01 March 2011.

Contributions should be sent to
CPOPT Annie Schofield (Assistant Editor) Tel: (02) 4424 2328 Fax: (02) 4424 1604 Email: navyairsafety@defence.gov.au. Contributions are invited from readers across Navy, the ADF and the retired community in the interest of promoting Aviation Safety and Safety Awareness throughout the RAN.

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Editorial

The editorial staff often receive comment that the focus of articles appears to be on aircrew and flying activities. The perception is that these articles take precedence over articles on maintenance and associated activities.

We at the FAASC make every effort to represent the total aviation safety message and any imbalance in articles is a true reflection on the number of submissions received.

This is your magazine, and your contributions make it the quality product it is recognised as being. Therefore, in order to balance the number of articles evenly, we seek more input from the maintenance and support areas of the FAA. Articles on any safety related matter are welcomed and will be considered for inclusion in the next, or subsequent, editions of TOUCHDOWN. If this plea is not sufficient, don't neglect the opportunity to be rewarded with tax free cash.

Ed.

CONTENTS

Foreword	2
Bravo Zulu	3
When Good Weather Turns Bad	8
Did You Apply the Brakes?	11
Is Going to Work a Distraction	14
Integrity – a Different Perspective	15
Flight 3 Maintenance Team	16
MRH 90 Single Engine Failure and the Safety Management System in Practice	18
Turbulence Explained – a Simple Guide to Understanding One of Aviation's Biggest Hazards	21
Lessons Learned for the Fleet Air Arm from 'Das Boat'	23
Big Sky Theory?	24
Aviation Safety in a Sister Organisation – an RAN Contribution (Two-part series)	25
Caption Competition	28
Crossword	28
Aviation Training Courses	Backcover

Foreword

BY CAPT SIMON BATEMAN, RAN
CHIEF OF STAFF FLEET AIR ARM
(COSFAA)

I would firstly like to thank the editorial staff of Touchdown magazine for inviting me to provide this Foreword to the Australian Defence Forces' premier Aviation Safety Magazine.

By the time this foreword hits the streets in November my posting as Chief of Staff Fleet Air Arm (COSFAA) will have come to an end. It will bring to a close what have been five great years which have spanned four positions including the Commanding Officer of 805 and 816 Squadrons, and the Commander Operational Airworthiness and Standards (COAS). I would have to say it has not only been great but it has also been tumultuous. Like most of us, the period was shaped by the tragic event which occurred on Nias Island in April 2005. At the time I had only been in command of 805 Squadron for one month and since then, I, like many of the rest of you have been subject to intense scrutiny as others tried to come to terms with how such a sad event could occur. The subsequent Board of Inquiry made a number of recommendations which were accepted and these are now everyday business.

The Maintenance Reinvigoration Programme (MRP) made wide sweeping changes which have had a transformational effect on how we conduct and supervise maintenance. In the positions I have held over the last five years I have been uniquely placed to see how these changes have now been inculcated into our culture. Some of them have taken longer than others but I believe they are now well and truly in place. This was no easy feat as some of these changes were substantial. Everybody talks about change but it is a hard thing to do, and I think it is a real credit to all of you that we are where we are today. It is a true demonstration of the safety culture we have in the Fleet Air Arm, one which I believe is second to none in the Australian Defence Force.

I am heading away from the Fleet Air Arm at a very interesting time in its history. We are about to see the arrival of MRH 90 at HMAS Albatross which will be closely followed by the commissioning of 808 Squadron. At the end of 2011 the mighty Sea King will come to the end of her meritorious career and 817 Squadron will decommission. By then we should know what the replacement aircraft for Seahawk and Seasprite will be and we will have a good idea on what will be replacing the Squirrel.

If the last five years were tumultuous then the next five are sure to be exciting, and if we thought we had experienced enough change, well I think it will be nothing compared to what we have to prepare for in the near future. We shouldn't be frightened by this change because I believe we have learnt from the past. We now have safety systems in place which will hold us in good stead as we introduce new aircraft. We track our hazards and we manage the associated risk using processes which lead the rest of the Navy. Perhaps, most importantly, we have people who have demonstrated that they can understand and accept change. YOU are our most important asset.

It's on the subject of people that I would like to conclude. I have worked with a fantastic bunch over the last five or so years. The great crew at 805 Squadron, who kept on trying to do their best in what were fairly trying circumstances, the team at 816 Squadron whose efforts in getting flights to sea are often unrewarded, and of course the hard working folk at the FAA Headquarters. The common thread that runs through all these people is a focus on safety and how can we make whatever we do as safe as possible. I look forward to watching from the outside for a little while and seeing that the thread remains unbroken.

Continue to Fly Safe.

Capt Simon Bateman, RAN
Chief of Staff Fleet Air Arm
(COSFAA)

Bravo Zulu

Guild of Air Pilots and Air Navigators – The Grand Master's Australian Medal
Grand Master His Royal Highness The Prince Andrew Duke of York KG KCVO

Awarded to an individual, a group or organisation involved in any branch of aviation in the Australian Region or to Australian nationals abroad, who or which has made a meritorious contribution to any aviation activity, either by displaying technical excellence or by the development of a procedure or operational technique of an outstanding nature.

On the 06 November 2010, 816 Squadron was awarded the Guild of Air Pilots and Air Navigators – The Grand Master's Australian Medal for its continuous, meritorious service in supporting national and international interests in the Middle East over an extended period. Over the period of the last twenty years 816 Sqn RAN has provided at least one, and often more, embarked helicopters in the Royal Australian Navy frigates that have been deployed almost continuously on various operations in the Middle East. Given the span of operations, the challenging environment and the extreme distance from supporting agencies, this has been an extraordinary achievement.

That 816 Squadron has maintained, quietly, efficiently and effectively, an almost constant maritime helicopter presence in the Middle East, over 7,000 miles from home and for nearly twenty years, is a reflection of the dedication and quality of the personnel involved.

The squadron has fulfilled a range of naval aviation missions, which have required the crews to be both balanced and flexible

in order to adapt to the ever changing environment. A highly professional training organisation has ensured that all crews have been mission ready and the technical support provided by the squadron maintenance organisation has been second to none.

Exceptional dedication to the Royal Australian Navy's mission, underpinned by a world class training programme, has ensured 816 Squadron has maintained a near continuous embarked operational maritime helicopter presence in the Middle East since 1990. It has provided an exceptional array of at sea capabilities spanning surface warfare, naval blockade operations, anti-drug and anti-piracy missions within a large geographic tasking area to Australian and allied operations in the Middle East.

BZ 816 Sqn

ABATA Lauren Short
817 Squadron

In July 2010, whilst embarked on HMAS KANIMBLA for Ex RIMPAC, ABATA Short was conducting a Before Flight Inspection (BFI) when she noticed a chafed pipeline on the utility hydraulic system. Whilst this is not out of the scope of a BFI inspection, the location of this pipeline makes identification of chafing very difficult with the rotary fairing fitted, her attention to detail lead to the chafed pipeline being immediately replaced.

Her commitment to the task at hand and attention to detail is commendable, especially considering she was at the time working outside at night on a moving ship by torchlight. On another occasion during an R1 servicing AB Short, again through her diligence and dedication to the job, identified three incorrectly routed pipelines on the blade fold rotary coupling.

AB Short is to be commended for her consistent attention to detail and her ability to identify unserviceabilites outside the scope of the task she is working in.

BZ AB Short

Bravo Zulu

ABATA Benjamin Clemens
723 Squadron

In April 2010 during an After Flight Inspection (AFI) on AS350BA Squirrel 801, ABATA Benjamin Clemens, who was at the time on late watch, noticed that the upper Main Rotor Head Servo Jack was contacting on the non rotating swashplate of the Rotor Shaft Unit (RSU). ABATA Clemens immediately informed his supervisor and during further investigation discovered that the upper eye end assembly of the Main Rotor Head Servo Jack had worn through protective metal bridges on the non-rotating swashplate and caused significant impact damage to the swashplate.

Engineering investigation of the non-rotating swashplate revealed that the swashplate had exceeded damage limits and required replacement of the RSU. AB Clemens' findings, lead to an immediate assessment of the remaining AS350BA fleet. During this assessment, similar damage was identified on the protective metal bridges of other aircraft. Deeper level inspections of these affected aircraft however, indicated that the damage was contained to the protective metal bridges and had not progressed into the swashplate assemblies. AB Clemens' actions have now enabled 723Squadron and NASPO to develop scheduled

inspections and preventative maintenance procedures. Early detection of the potential for the Main Rotor Head Servo Jack to contact and impact on the non rotating swashplate has prevented the occurrence of this issue on other aircraft, thereby avoiding potential RSU changes, improving serviceability and availability and ensuring the integrity of the airframe is maintained. AB Clemens is to be commended for his professionalism, diligence and attention to detail.

BZ AB Clemens

CPOATA Gary Pybus
816 Squadron

Following the collection of oil samples from the main rotor gearbox main module of N24-016 (Tiger 885), CPOATA Pybus was conducting an Independent Maintenance Inspection of the work zone for:

- security of the filler cap and drain plugs;
- cleanliness of the surrounding area; and
- confirmation of the absence of Foreign Objects through a Foreign Object Control (FOC) check.

In the process of conducting these checks, CPO Pybus broadened his inspection to cover the complete main rotor gearbox, its attachments and mounts, all accessories driven from the gearbox and all flight controls located forward of the gearbox. This was to ensure that there were no anomalies anywhere in the entire zone beneath the aircraft's forward sliding fairing.

During this enhanced independent inspection, CPO Pybus noticed a piece of aluminium tape, measuring approximately 100mm x 50mm, attached to the rear face of the Forward Bridge Assembly. The tape was wrapped halfway around the rear lower web. The tape was located in a position that was well hidden and significantly blocked from view by access panels and other components and is not specifically detailed as part of the FOC check required following the oil sample collection. The piece of tape had been on the aircraft for approximately four months and had not been detected during multiple Before and After Flight Inspections. It was only through the diligence of CPO Pybus that the tape was discovered.

CPO Pybus' professional conduct and behaviour are reflective of Navy's values and his actions have resulted in the assurance of technical airworthiness of one of Navy's critical aviation assets.

BZ CPO Pybus

LSATA Brenton George
816 Squadron

816 Squadron Grey Team were completing an S177 servicing on N24-015 (Tiger 884) which is a complete zonal examination of workzones (WZ) 0800 (external) and 0900 (internal) encompassing the mid-fuselage, the transition section and tail cone and also includes corrosion preventative application tasks.

As part of the servicing, LS Brenton George undertook a separate inspection of the WZ 0800 compartment containing the upper starboard overhead and vertical pushrods, levers and other flight control components. LS George's inspection was a general inspection looking for anomalies of any type in that compartment.

During this inspection LS George identified that several rivet tails were sitting on the uppermost stringer in the compartment at the extreme forward end of the access cover aperture at station 0800. It is not known how or when the rivet tails were left in that location and their discovery by LS George was particularly noteworthy as they were well hidden and difficult to see in the location they were in. The discovery of the rivet tails was important as they had the potential to cause significant Foreign Object Damage (FOD) in that they could potentially:

- bind or restrict the aircraft's flying controls and potentially render the aircraft catastrophically uncontrollable, or
- significantly damage the flying controls (pushrods, levers, etc) by introducing stress raisers through gouging or scratching of the items due to the material hardness of the rivets compared to the flying control components thereby leading to potential catastrophic failure of the components in the future.

LS George's diligence, proficiency and behaviour are reflective of Navy's values and his actions have resulted in the prevention of potentially disastrous consequences.

BZ LS George

LSATV William Carter
817 Squadron

During RIMPAC 2010, LSATV William Carter was the Flight Deck Marshaller onboard HMAS KANIMBLA during the start sequence for a Sea King mission in support of Exercise RIMPAC 2010. After spreading the main rotor blades, the pilot was conducting a full and free check of the rotor head, exercising the cyclic and collective controls. During this sequence, he noticed an anomaly where one of the many pipelines integral to the Sea King rotor head appeared to be in contact with another part of the main rotor head assembly. He halted the start sequence and contacted an Airframe Technician supervisory sailor who, in turn, also observed the anomaly. On closer inspection, it was found that a fold/spread hydraulic pipeline was rubbing against a pitch change eye horn and pitch change rod. The aircraft was shut down and the problem rectified.

LS Carter was wearing a dark safety visor to protect himself from the bright conditions on deck and his responsibilities as Flight Deck Marshaller reached much further than examining the rotor head for faults. The fact that the problem was only visible when the subject rotor blade was in a certain position makes his observance that much more diligent. To have noticed this in these conditions required an exceptional degree of concentration and attention to detail. His actions prevented a possible failure of that pipeline and hydraulic fluid loss during the next fold sequence.

BZ LS Carter

Bravo Zulu

LSATV Rhett McKee and ABATA Keith Eddy 816 Squadron

LSATV Rhett McKee and ABATA Keith Eddy were proceeding to N24-009 (TIGER 878) on display at RAAF Williamtown as part of 816SQN's participation in the 2010 Williamtown Airshow.

Between the maintenance building (76SQN HQ) and the 816 Seahawk display aircraft several civilian helicopters were conducting joy flights. To support these joy flights, the operators had positioned a refuelling rig in the vicinity for ease of use.

One of the civilian Bell 206 Jet Ranger helicopters was in the process of conducting a hot refuel at the time that LS McKee and AB Eddy were transiting out to TIGER 878 so they waited at a safe distance for the evolution to be completed. Only the 206 pilot and one ground crew member conducted the refuel. On completion the all clear signal was given and the ground crew member returned to the company's tent, approx 250 meters away. The 206 launched vertically to reposition for further joy flights.

After the 206 launched LS McKee and AB Eddy proceeded towards the display aircraft keeping an eye on the 206. AB Eddy then noticed movement in the grass and realised that it was the bonding lead from the refuelling rig. As the aircraft hover-taxied they noticed that the bonding lead became taut as it was still attached to the aircraft. By this time both sailors had noticed the incident and waived their hands to signal to the pilot. Fortunately they caught his attention and he quickly landed.

As the aircraft was landing the bonding lead, which was approx 60 meters long, had detached from the aircraft and recoiled close to the refuelling rig. The sailors secured the bonding lead back to the rig and highlighted to the pilot the situation that had occurred by holding up the bonding lead. Ground crew from the civilian company then took action to liaise with the pilot and assess any damage. Nil damage was evident and the aircraft resumed flying.

Through the attention and diligence of LS McKee and AB Eddy a potentially catastrophic incident was prevented. The bonding lead had the potential to become entangled in either the 206's main or tail rotors and consequently cause the aircraft to crash. The professional conduct and quick action of these two sailors are reflective of Navy's values.

BZ LS McKee and AB Eddy

HMAS ALBATROSS PERSONNEL
BZ from a letter received from the South Coast Recreational Flying Club.

The South Coast Recreational Flying Club would like to thank you and your team for their support and assistance during the emergency involving one of the clubs' aircraft, CFI and club member on 06 June 2010. We wish to extend our sincere appreciation for the professional, supportive manner your team delivered and the opportunity to use your facilities and equipment under the circumstances.

The Pilot and CFI, while concerned for their welfare in landing the stricken plane, felt that regardless of the ultimate outcome they were in the most capable of hands. Please pass this note of thanks on to all those involved on the day.

We are most thankful for your presence in the area and will only be too happy to provide our assistance and support in any way you may request in the future.

BZ HMAS Albatross Personnel

CPL Gavin Jones
PTS

On the afternoon of Wednesday 15 September 2010, the Parachute Training School (PTS) Nowra was conducting descents onto Husbands DZ Impact Point 'B' at HMAS Albatross, as part of a suite of Military Free Fall courses. During the afternoon, there was a significant amount of air traffic operating in the vicinity of the airfield.

Descents were being conducted IAW all relevant doctrine, including the use of the PTS 'Canopy Drift Cone', a template which has been in use for sometime now and allows the concurrent conduct of parachute and aircraft operations in the Albatross area.

CPL Gavin Jones was the allocated Drop Zone Safety Officer for day. Throughout the day, a number of rotary wing aircraft were operating close to the edge of the 'drift cone' template. Though operating safely, it can be difficult to orientate and estimate the safe visual boundaries in the context of a multi dimensional activity. Added to this was the amount of various air traffic operating in reasonable proximity, making a routine task quite complex.

During one particular sortie that afternoon, with all the activity going on, CPL Jones thought that a number of personnel conducting a Free Fall descent had inadvertently drifted further north than previous sorties, and possibly outside the cone template. Monitoring the air traffic, and anticipating the track of a number of rotary wing training operations he had seen take earlier in the day, CPL Jones immediately called the Tower to inform them of a parachute outside the cone template (and therefore potentially in airspace being utilised by rotary wing aircraft). Coupled with vigilance by personnel in the Tower, CPL Jones was asked to confirm if there were in fact parachutes outside the 'cone'. A quick re-assessment by CPL Jones proved however that the parachutes had not left the cone, and that they were operating safely within the confines of the template. He informed the tower that all parachutes were in the cone. As such there was no requirement to unnecessarily divert any aircraft.

Though the paratroops were safely well inside the wind cone template at all times, and there was no actual breech of safety, this incident has resulted in the raising of an ASOR which has yielded some positive outcomes. These included the review of associated procedures by the Air Traffic Control (ATC) and PTS of operations, as well as highlighting the need for direct communication between the personnel manning the tower and the OIC of the parachuting activity. However the main positive outcome was the willingness and confidence of CPL Jones to make a sound

decision based on real time events. Though he realised shortly after he made the first call to the tower that the parachutes had not flown or drifted outside the wind cone template, he is commended for making the what can sometimes appear to be the difficult decision he did.

Given the amount of information flow CPL Jones was dealing with as a result of the unusual and perceived close proximity of air traffic to parachute operations, CPL Jones is commended for making 'the call' under the circumstances on the day.

BZ CPL Jones

BY LEUT B SINCLAIR, RAN

When Good Weather Turns Bad

ABOVE A Squirrel helicopter takes off during flight exercises

As I made the embarrassing walk in the rain past some confused onlookers from the nurses tea room, I thought to myself "that flight was a bit more exciting than I had anticipated".

I was making the long journey from the sports field adjacent the Shoalhaven Hospital Helipad to the cafeteria for some well earned coffee for myself and the rest of the crew. Looking at the low cloud sweeping over us and comparing it to the time on my watch, I knew we would be here a while. Never again would I be able to find someone to 'just fill in for a couple of hours' on the duty desk.

The afternoon flight was planned to be a fairly standard utility practice sortie. It was to consist of pinnacle approaches, confined area operations (CA) and a dash of box knocking in Danjera Dam. The crew consisted of a fellow line pilot as Aircraft Captain (AC), an experienced PO Aircrewman, and myself. The planned flight time was going to extend into my rostered duty time. In order to achieve the hours required for currency, I managed to sweet talk someone into covering my duty during my flight.

All of the necessary considerations were discussed during the pre-flight brief with the Squadron Commanding Officer (CO); our Authorising Officer(AO). A particular emphasis during the brief was the weather. We were working off the Trend type Forecast (TTF) which included the following "9999 LIGHT RAIN BKN030 OVC048... TEMPO...5000 BKN015". In other words; the weather was poor for most things, but acceptable for utility operations in the immediate local area. A key discussion point also included options and actions we could take if the weather turned sour whilst we were away – somewhat ironically or rather judiciously if weather prevented us from returning to the airfield! We noted that at worst the cloud base should be 1900ft

AMSL near the airfield and assured the CO we would keep a vigilant eye on the weather in order to return if it deteriorated.

We launched in visual meteorological conditions (VMC) and transited to Helo West on our way to Pinnacle One with the weather looking fine for our operations. We had light winds from the north-east and plenty of visibility with the cloud high enough above us to not be of concern. The AC and I both each completed a pinnacle approach with a practice winch before moving on to Danjera Dam for the box knocking.

On transit to Danjera Dam we observed patches of low cloud towards the south along some of the valleys but none of the valleys we were intending to use, and if anything, the cloud was slowly moving south away from us. We noted that if we came across any cloud near the dam we would simply come back the way we came, as it was clear and we couldn't see any adverse conditions coming our way. So onwards we continued. The water was mirror smooth and flat, and to make it more challenging both the AC and I attempted an auto pilot out pickup. We managed to pick up the ring first pass on both occasions – that never happens when an instructor is sitting next to you! Having had enough of the box knocking, and feeling quite satisfied with ourselves, it was time for the AC to show me a CA I had not seen before.

The CA was towards the north at of the river junction between Yalwal Creek and the Shoalhaven River. It is a challenging spot that requires a touch of valley flying and a right hand turn on final to get into. Once on the ground in the pad you look around, and observe how great is this? It would take at least a day of four-wheel-driving to get out to a place like this. On the ground we discussed our options, as the sortie end time was approaching. I could have a go at the approach, or the AC could show me another place I hadn't been to at Parma Creek, just south of the airfield. I opted to be shown a new place and it was on the transit in the airfield's direction that the meteorological conditions became challenging.

Travelling east, essentially following the Shoalhaven River, we came to the point where we would usually turn towards Parma Creek. The weather towards the creek didn't look too crash hot; in fact the weather in general as we approached the airfield was deteriorating rapidly.

The AC decided to knock the rest of the sortie off there and simply head home. The aircrewman and I agreed. The ATIS advised we still apparently had a cloud base of 1500ft, high enough for us to get in. However this ended up not being the case. We requested Special VFR and continued along the river towards the airfield. Approaching the vicinity of Pinnacle Seven, we found ourselves flying lower and lower to avoid the cloud. Towards the rising terrain the visibility was terrible. I was having difficulty making out the difference between the cloud and the grey soup that was our horizon, and I was beginning to feel very uncomfortable.

Telling myself this was not a good place to be, I voiced my unease and the AC acknowledged his own, whilst slowing the aircraft in reduced visibility. Then it appeared the cloud was meeting the ground ahead. "Clear paddock to our left – let's land there!" I firmly suggested. The AC didn't need any convincing as he immediately reduced height and turned towards the bright green paddock that had conveniently lit up like a beacon (probably because it was the only patch of land receiving light from a hole in the clouds).

We commenced to orbit the paddock in question, to the north of Pinnacle Seven, east of the Shoalhaven River. I notified Air Traffic Control (ATC) of our intentions to hold in our current position due to weather, and requested an updated weather report. We were advised to report on the ground and subsequently landed uneventfully. Safely on the ground we took a breather and passed exactly where we were to ATC. At this point we still had 45 minutes of fuel remaining with reserves intact. As a crew we started discussing our options. Firstly we could wait for the weather to pass, and then reattempt to return to the airfield. However, ATC came back to us with a more realistic update of the weather, and the conditions weren't going to improve in the next few hours, therefore not before nightfall. Waiting for improvement in the weather was no longer an option. Our current position didn't look easy to drive to, and I didn't feel like spending an impromptu night under the stars (or clouds) in the middle of winter. After further discussion we developed our plan to reattempt the approach over Bamarang Reservoir and into the airfield. Failing this we would continue along the river making our way to the lower ground and approach the airfield from there. In the worst case we could land at the Shoalhaven Hospital helipad on the river bank. We drew a line on our map, and the AC emphasised that we would have to take it slow and spot EVERY wire before continuing (a good reminder to always ensure your local hazard map is up to date!), noting there were many marked between us and the hospital. Next we had to notify our Squadron Command as to our plan, and obtain a low level Not Below 200ft above obstacle authorisation for the attempt.

Telling myself this was not a good place to be, I voiced my unease and the AC acknowledged his own ...

After a few attempts on the radio, it was clear we could not reach the Squadron on VHF. Rather than relay via ATC, we could orbit at our current position and try establishing communications in the air. After gaining approval to get airborne from ATC we were soon doing laps above my favourite green paddock. We were able to get in contact with the Squadron Command where

our options and intentions were communicated. The wire considerations were re-emphasised to us, as well as 'draw a line on a map' prior to onward authorisation. We then passed our intentions to ATC, and we where again cleared to the airfield. On exiting our holding orbit for our first option, heading towards the reservoir, we started skimming the cloud, and I took a glimpse of the altimeter – 400ft. 'Hmmm, that's not good' I thought. We could just make out the reservoir, but could not see the other side. "Shoalhaven River it is" confirmed the AC. We arranged our cunning second plan to track via the Shoalhaven River with ATC, we continued gingerly on our way.

So there we were at 50-60 knots, 200ft on Radalt, skimming the cloud, with eyes the size of golf balls searching, identifying, and confirming EVERY wire along track towards the Shoalhaven Hospital. The aircrewman had the right side, I had the left, and the AC focused ahead. I never appreciated how many wires man was capable of stringing across a river until then. Abeam the Shoalhaven Hospital the visibility became far worse as we entered showers. We could only just make out the bridge ahead which was bordering on 800 metres away. Everyone verbalised their reducing comfort with the degrading conditions and our probable inability to safely continue the planned return to the airfield. At this point the AC turned towards our final option, the hospital pad. I notified ATC of our latest intentions whilst the AC and aircrewman ran through a quick Power Wind Plan on final, taking us over the car park and flood lights. We had all been here numerous times before, so we were comfortable with the considerations and now wasn't the time to muck around. This weather was rolling in and any further delay could prevent us even getting in here! Safely landing, the AC and the aircrewman moved the aircraft clear of the helipad to the edge of the oval. Once on the deck ATC was informed, and it was time to shutdown, take a breath, and make a phone call to the CO. I also owed the person covering my duty big time.

Whilst the squadron made arrangements to send the cavalry, we had time to stop and reflect. We had not been negligent in our appreciation of the weather. We believed we had been keeping an eye on it; however we still got caught out.

Thankfully our CRM within the cockpit, with ATC, and with Squadron Command developed a feasible plan for a safe solution to the untidy predicament we had found ourselves in. In addition, we had found a landing spot that served coffee. It's amazing how some of those 'what ifs' in brief can come to fruition!

By SASO 723 Sqn. (Ref; ASOR 723SQN-073-2010)

As stated by the pilot of this incident the crew were all current and capable of conducting the planned sortie and the forecast appeared suitable to all involved in the briefing and authorising process. Reduction in the weather was discussed during the sortie brief and probably assisted the crew in dealing with the actual conditions encountered. The crew are commended for their handling of this issue, some sound use of CRM and AVRM principals. Their use of the Squadron frequency to discuss options and obtain appropriate authorisation was sound, assessment of the wire hazard appropriate and their final decision to utilise a known landing site for terminating their sortie was by far the safest decision. More experienced aviators may have pushed further to make it back ... but may also have found an unmarked wire or tall tree! (Shades of Sydney to Bathurst for the race weekend!)

The crew were all safe, a valuable lesson had been learnt ... don't blindly trust a forecast! ...and could be passed on to their peers, the aircraft was back in the flypro first thing in the morning and most importantly LEUT Sinclair got his coffee!

LEUT Sinclair is awarded a $200 cash prize for his article submission to TOUCHDOWN magazine. Congratulations

Did You Apply the Brakes?

BY LEUT D LACEY, RAN

ABOVE Flight deck operations on HMAS SUCCESS as HMAS CANBERRA'S Seahawk helicopter transfers personnel and stores.

Any member of the aircrew fraternity who has completed some sort of safety or Crew Resource Management (CRM) training in their career will no doubt be more than familiar with the story of the Eastern Airlines Flight 401, which crashed into the Florida Everglades in December 1972. The accident was a result of the autopilot inadvertently being disengaged while every member of the crew was focused on a questionable light bulb in the cockpit. It's the classic example used for illustrating CRM breakdown, and distraction from tasks which needed top priority in resource allocation (ie not flying the aircraft into the ground, as opposed to fixing a light bulb).

Now I can't speak for everyone else, but I suspect many might be like myself when someone starts discussing this example. Just like hearing again about Teneriffe, or Bud Holland crashing his B52, you might have a tendency to say to yourself "I know where this is going... heard it a thousand times. Yeah I get it already". However an incident that occurred whilst embarked recently, made this story seem a great deal more real and relevant to the crew of Shark 05.

The sortie profile for the night was night Deck Landing Practice (DLPs) in order to get the co-pilot qualified for night embarked operations, followed by some message bag transfer evolutions for both the co-pilot and the rear seaters' benefit. Due to the combined nature of the flight, a full crew, consisting of a Qualified Helicopter Instructor (QHI) pilot, co-pilot, observer, instructor aircrewman, and two utility trained aircrewmen, were onboard the aircraft for the duration of the sortie.

As well as having a pilot under training in the cockpit, the ship was also using the sortie to train a Helicopter Control Officer (HCO) who had very limited experience of night operations. It was a pitch black night with practically zero illumination, and overcast with occasional light showers. Maybe not ideal conditions for first time Night Deck Landing Practice (NDLP) training, but by no means unsuitable, or

At no point during this chain of events were downwind pre-landing checks completed.

pushing any limits. The deck motion was also benign, and well within night deck landing limits. This was the first night sortie that the newly embarked aircrew had conducted on the ship during this detachment, and was the first one for the ship's crew in some time.

The first circuit went without any hitches, as the instructor talked through the techniques and procedures for night DLs, and the aircraft was subsequently landed safely back on the deck. Upon launching for the second circuit, the QHI prompted the co-pilot to release the brakes as a reminder to recycle them on downwind (the custom being to reset wheel brakes on every second DL).

Once the aircraft had reached its circuit height of 200 feet with radalt engaged, a left turn onto downwind was commenced, and it was at this point that the trainee HCO requested the aircraft confirm "ops normal". The standard indication for ops normal is to turn on anti-collision light(s) post take off. The QHI had turned on the rear anti-collision light only, in accordance with Squadron Standard Operating Procedures (SOP) (which was also the only anti-col visible to the HCO once the aircraft had departed), whereas the HCO believed he should be looking for two lights.

The AC provided a response in the affirmative, followed by a request from HCO to indicate ops normal with anti-cols. The QHI then confirmed that he had turned on the anti-col, and some confusion followed as crewmembers started to look around to see if they could confirm the light was working. Whilst the QHI discussed with the aircrew in the rear, and requested they try and get visual confirmation, the co-pilot also started looking in his mirror to see if the light was visible, as well as confirming the switch position inside the cockpit.

At this point in time it would be safe to say that a grand total of 6 crew members were all trying to find out if the rear anti-col was functioning properly. It's also safe to say that none of the crew were aware that the problem the HCO had was only with the forward anti-col not being switched on. As mentioned, the aircraft was in a turn at this time, and whilst distracted the co-pilot turned the aircraft through the downwind heading, and continued to turn past this required heading by approximately 20-25 degrees before noticing his mistake. His comment of surprise, and immediate change of attitude to rectify the situation, caused the QHI to look down inside the cockpit and question the aircraft's position/heading.

The QHI instructed that a corrective heading be taken up to get the aircraft back onto the right spacing, and by the time this was rectified it was time to turn onto final. From this point on the QHI and co-pilot (CP) were fully immersed in the instructor/student role, and conducted/monitored the procedures for a visual approach at night. Now the astute amongst you might be asking yourself "why hasn't he mentioned the downwind checks in this detailed account of events?", and it's interesting that you should ask that. At no point during this chain of events were downwind pre-landing checks completed. More importantly, at no point did any of the 6 crew members notice or flag this less than satisfactory condition.

The backup in place for pre-landing checks is to have finals checks, consisting of "two greens, brakes on, anti-cols off". Due to the high workload in the front of the cockpit and the instructional nature of the sortie, these checks were forgotten until very late finals during the transition from the stabilised glideslope indicator (SGSI) to visual flight deck references. All that was checked and verbalised was "two greens", before focus was again taken up with the actual flying. Again the most important thing to note here is that none of the 6 crew members noticed or flagged this omission (noticing a trend here?).

Most readers will already see where this is going, and will now understand why I mentioned the seemingly trivial information about the brakes being released on departure. Yes, that's correct - the aircraft was subsequently landed on a ship's deck at night with no brakes applied. The co-pilot noticed forward movement on the deck as soon as the collective was lowered, and applied toe brakes whilst calling for the QHI to apply wheel brakes. The aircraft

would not have moved any more than 150 mm (6 inches) before brakes were applied, so the analogy with Flight 401 does somewhat break down in the potential-hazard-to-life-and-limb stakes. The principles though are very relevant, and the need to learn from others' previous mistakes rather than your own cannot be emphasised enough.

The subsequent investigation brought out a number of factors including workloads during instructional sorties, the need for clearly defined standards in the area of visible signals (changes were made to documentation in order to ensure all members were operating under the same SOPs), and the tendency of crew members to relax during phases of a sortie that don't involve them. Of course the need for the flying pilot to actually focus on flying the aircraft above all else is not to be ignored or down-played, but the key issue though was that due to a chain of small errors/confusions/distractions a total breakdown in CRM occurred, in an environment where everyone needs to be totally on their game and contributing effectively to the crew environment.

There were more than enough resources in that crew at the time to completely swamp the relatively minor issues that arose during the circuit in question. Unfortunately, for a number of reasons the management of said resources was lacking. No doubt each member of the crew learnt their own lessons from that night, and I can't speak for them, but I know that two things stand out for me. Firstly it is imperative that as a member of any crew you need to be switched on, no matter how simple or straightforward a task may seem. When you're flying on a dark cloudy night, in the middle of the ocean - even doubly so.

It sounds like a cliché from a badly photo-shopped safety poster, but your safety and ability to return home alive is your own responsibility! It's not showing a lack of faith in other crewmembers to be ensuring that other crew are doing their job correctly (or questioning an action of theirs which you're not sure of), but rather an acceptance of the fact that we are all human and can all make mistakes. The whole point of a team environment is to have backup – going in all directions. Guys in the back can't just assume that the ruggedly handsome front seaters are always all over everything, and are operating well within their limits. Guys in the front can't always assume that the hard working backbone of the crew, down aft, have full situational awareness as to what's going on up front. Most of all, if you think a portion of a sortie doesn't involve you, then you're in the wrong mindset – you're a member of that crew and therefore are involved for the duration of the flight. Easier said than done sometimes I know, but let's face it we're always getting paid for being there – may as well always earn it.

ABOVE Seahawk Helicopter

The second big thing I took away from it was to try a little harder to learn from other peoples' previous mistakes, rather than hearing stories and simply pigeon-holing them as human factors, systemic, CRM, etc in order to tick the relevant box. I certainly don't want to end up actually becoming a starring role in one of those stories that becomes another "oh yeah I've heard this one before"!

By FASO

There are no new ways of having an accident, despite all of the new technology available to us. A recent search of helicopter accidents and near accidents in Australia in 2010 revealed at least four instances where the Eastern Airlines Flight 401 syndrome was clearly evident, that is a serviceable aircraft was flown into the ground by a crew not paying attention to flying it. The author's words are full of wisdom and succinctly illustrate why we have such a strong focus on case studies. A lesson well learnt here without any damage or injury. Let's not have all of us go through the same learning process, but take heed of the lessons demonstrated in the case studies we are presented with. A second well brought out lesson is that of crewmanship. If you are in the aircraft, you are a part of the crew. Contribute to your own safety and practice airmanship and CRM at all times.

LEUT Lacey is awarded a $100 cash prize for his article submission to TOUCHDOWN magazine. Congratulations

BY POATV S EDWARDS

Is Going to Work a Distraction?

ABOVE Sea Hawk is embarked onboard HMAS SYDNEY

It's a normal day at sea. I wake up, take a shower, have breakfast and head aft to the hanger to see if the LAN computer is free. I like to get down there a bit early so I can check my email before work. Damn, someone is on it. When I do get to log in, there is no email from home... How's the little lady? Haven't heard from her in three weeks now, I wonder if anything is wrong, everyone else is getting email. I will check later.

Its time to go to work. The Leading Seaman is barking something... What did he say? The PTI is conducting PT on the flight deck. Why can't they do that activity without düsh düsh music blaring all the time? It makes for difficult communication. The Flight Senior Maintenance Sailor (FSMS) has the flying program for the day. Typical, Deck Landing Practice (DLP's) over lunch again. Why do they always have the ship closed up for flying over meal times? What a pain. We maintainers and Flight Deck Team have to go to early lunch with the watch keepers. What now?... The chief cook just went off at us, told us to get out of his café, '@#!$ birdies, you're not watch keepers'. The PO has to ring the galley to organise our SCRAN. Now it's all good.

After the flight there are the usual questions. Is it US? What's wrong with it? A flight control system (AFCS) fault has been identified, that will be good for my journal. Standard post flight activities, compressor wash and drying out run need to be completed before we can commence any defect investigation. We need the aircraft spread on deck for the AFCS troubleshooting... What? The Bosuns are doing a shoot. When? The bridge has called and ordered the aircraft to be stowed in the hangar. How long is the shoot? When are we going to do the AFCS? We are advised we can start troubleshooting at 1500. Right, do we have approval to move it? To fold it? To strike the nets?

"Clean up mess decks and flats for rounds" is the pipe that interrupts our post maintenance work. I can't go now; I am half way through the functional inspection. Fortunately the PO has sent the 'A rates' to conduct the necessary cleaning.

Dinner came and went like every other day at sea, now I just have to finish buttoning up the aircraft and do the SCAMM2 work and that's it.

"Smoke smoke smoke. Smoke detected 2 kilo passage way, standing sea fire party muster and report" reverberates throughout the ship. Oh no! Not another Damage Control Exercise. "Hands to emergency stations. Hands to emergency stations" Now the hangar is full of people... Hey you, don't lean on that. Don't touch those... "You there, get into fire fighting rig and report to repair base 2" Well that's another hour and half delay in closing up the aircraft. Right, has anyone seen the 3/8 spanner out of toolbox 4? Not a lost tool, not now. No, here it is; no problems, secure the aircraft.

Work's done, but the Leading Seaman told me to make sure all that work is in my journal by the morning, I'd better get onto that. I'll just check my e-mail... Still nothing from the hugs and kisses, wonder if something is wrong?

We have an early launch in the morning... It's starting to get a bit rough, I hate the rough weather, I'm going to my rack, I can't sleep properly, and to cap it off, Spinner gets sea sick and makes horrible noises all night.

BY FASO:

Whilst somewhat tongue-in-cheek, this article describes the impact of distractions that are reflected in many of the ASORs we receive. Distraction is a real threat to the professional output of every task we undertake. Be aware! Look after yourself and your team in avoiding errors through distraction.

PO Edwards is awarded a $50 cash prize for his article submission to TOUCHDOWN magazine. Congratulations

BY LEUT J ROMBOUTS, RAN

Integrity – a Different Perspective

ABOVE The Formation of Royal Australian Naval Helicopters preparing to take off from HMAS ALBATROSS for the Fleet Divisions fly past.

Last weekend my son and I were fixing a punctured bike tyre. We were joking at how amazing it was that the fragile looking spokes had the strength to carry the weight of a person; namely mine. He was curious as to how it was that you could bend a spoke with your hand and yet the tyre as a whole had enough strength to hold the weight of the person riding the bike.

I explained, in a simple terms, that the strength of the tyre came from each of the spokes combining to form a whole, and share the load; and that the same sorts of engineering principles used to make the tyre were also used in the structural design of bridges and tall buildings.

It occurred to me later, that what I was explaining was that the tyre had integrity. The kind of structural integrity that is required and evident in the aviation industry. Structural integrity is defined as a wholeness, it affects the item's function and safety and ensures that structures, equipment and machinery satisfy their given design criteria, predicated on safety, serviceability and performance.

It is precisely this different perspective of integrity that I believe should not be overlooked when we reflect upon and apply the Navy value of Integrity here at HMAS Albatross.

In the navy we associate Integrity with honesty, reliability and basically doing the right thing without having to be asked or have someone checking up on you. Thinking back to the example of the bike tyre; it is never asked to do anything but it performs honestly, it is reliable and always does the right thing if it is properly operated and maintained.

By applying these principles, I believe that the Fleet Air Arm (FAA) can learn from Integrity. Just as the spokes of the wheel rely upon one another without having to be asked or told to do the right thing, aircraft operations rely upon the integrity of all personnel involved to:

- take action before being asked,
- complete tasks the right way without someone checking up on you; and
- always perform to the best of your ability.

An organisation that stands on a reputation of Integrity has the trust of its employees, the admiration of industry colleagues and most importantly the self-respect that comes from living by your values.

Flight 3 Maintenance Team – CJTF633 Bronze Commendation

BY POATA C MARSH

Editor's note

The Flight 3 CJTF Bronze Commendation was listed in the BZ section of Edition 02/10 of TOUCHDOWN. This article provides more detail of some of the events that led to the award of the commendation.

816 Squadron (Seahawk) Flight 3 embarked in HMAS *Toowoomba* for Rotation 21 of Operation SLIPPER in July 2009 without fully knowing what the deployment would involve. With the conclusion of TF 152 and the RAN's involvement in the Northern Arabian Gulf (NAG), and piracy on the increase off the Horn of Africa, *Toowoomba* and the flight faced many unknowns.

Having completed Unit Readiness and Mission Readiness evaluations in the Western Australian Exercise Area, the nature of the mission remained relatively unclear until after a brief logistical stop at Diego Garcia a few days prior to in-chop into the Middle East Area of Operations (MEAO). With the previous expectations of another Arabian Gulf routine well and truly squashed, *Toowoomba* and Flight 3 then geared up for high level boarding operations in search of drugs and people smuggling off the Pakistani, Indian and Omani coastlines, as well as anti-piracy operations off the Somali coast in East Africa and the Gulf of Aden.

Flight 3 sailed with 110 Airframe hours (AFHR's) remaining until the next phase servicing (due every 190AFHR) scheduled to occur in Dubai some 8 weeks later.

The Flight Commander and Flight Operations officers set about creating an operations plan that required a rigorous maintenance regime to support ship commitments as tasked by the joint task force HQ.

The Flight Senior Maintenance Sailor (FSMS) with the assistance of the Maintenance Manager and Quality Assurance and Data Manager devised a robust plan to meet these commitments. A Maintenance Interval Extension Request (MIER) for an additional 40 AFHRs was approved, giving the flight and *Toowoomba* the kind of flexibility that was required for the long range missions and tasking that comprised the first half of the deployment in the Indian Ocean and Gulf of Oman.

At that phase of the deployment – from July to September – the monsoon had a profound impact on sea states and deck motion, both day and night. As a result of the constant salt spray a constant and dedicated husbandry routine by the entire Flight personnel was enacted to prevent corrosion. Comments and feedback made by Coalition Forces about the state of the aircraft were passed to CO *Toowoomba* and also formed part of the word picture of the subsequent Commendation. Of special note was the contribution to the aircraft washes by all the aircrew, but especially the flight Aircrewman who brought a new dimension with his wardrobe innovations from Spiderman suits through to nurse outfits and beyond.

The Junior Maintenance Sailors dug deep when required as the aircraft encountered an inordinate number of electrical

unserviceabilities due to the humidity. The flight ATV sailors conducted troubleshooting on almost every system on the aircraft from countermeasure dispensing system (CMDS) through to Automatic Flight Control System (AFCS) during this monsoon period and always returned the aircraft to a serviceable state between sorties.

Penalty maintenance incurred as a result of the MIER was carried out in Salalah (Oman) and Karachi (Pakistan) as stores become available. Careful planning was then adopted to break the remaining phase servicing items into those requiring an maintenance test flight (MTF) or major disassembly and those that were mostly routine in nature.

In addition to the maintenance activity the aircraft was required at Alert 30 for ten hours each day. Assistance from ship's company flight deck teams allowed the flight maintenance personnel to form two watches by trades. With theses watches in place MM's were then able to direct and complete maintenance over extended hours whilst simultaneously managing fatigue and crew duty. The watch of ATA sailors worked through the night to complete inspections and unscheduled maintenance whilst the ATV team worked through the day to rectify the constantly emerging electrical faults.

In a report submitted by the Maintenance Manager just prior to the C Phase (mid deployment) servicing, it was concluded that the Maintenance Team for Flight 3 had accumulated 20,000 man-hours of work for the 10 men since February, and the aircraft had flown 240 hours. Comments received through the chain of command indicated that efforts were not going unnoticed with *Toowoomba's* aircraft achieving a serviceability rate in the MEAO of greater than 94% for the entire deployment.

To expedite the conduct of the C phase mid-deployment servicing in Dubai (Free Port Jebel Ali) extra personnel comprising a RAAF non destructive inspection (NDI) Tech and two experienced LSATA personnel were provided from 816 Squadron. With the penalty maintenance and half of the servicing items already completed, the servicing was fully completed within five of the ten day maintenance period. The aircraft became fully mission capable (FMC) within 24 hours of sailing after completing an MTF.

With the servicing completed and *Toowoomba* well into the second half of the deployment, the sea state abated, clearer skies and more coalition ships were the order of the day. With the easing of the monsoon more vessels of interest had to be interrogated, requiring the aircraft to be launched at very short notice in a tight corridor known as the Internationally Recognised Transit Corridor (IRTC)[1] .

This period pushed crew duty limits at times, due to the nature of the flexible tasking and the sporadic activity of the vessels of interest. Morale, however, remained high as Flight 3 had earned a solid reputation for serviceability that drove pride into what was, at times, a very capricious and frustrating environment. Respite was earned with a short port visit in the African country of Djibouti and then in Aqaba (Jordan) over a 6 day period at which point Command Joint Task Force (CJTF633) was flown on board to tour Toowoomba and meet the crew.

The run of 100% serviceability rate ended three weeks later on an after-flight inspection when a bracket supporting the Main Rotor Blade balance weights was found severed and another bracket holding the Main Rotor De-ice loom was partly sheared. Only the fully severed balance weight bracket could be replaced onboard without logistic support. The unserviceability could not be rectified until a port visit to Abu Dhabi two weeks later.

Toowoomba had one last patrol just outside the Straights of Hormuz in the Gulf of Oman acting as "Plane Guard" to aircraft carrier USS Nimitz. The flight aircraft nicknamed "Pegasus" was then able to conduct many and varied tasks assigned by USS Nimitz as well as some much appreciated passenger transfers and cross deck visits.

On return to Dubai – *Toowoomba's* last for the deployment – CJTF633 visited the ship and presented various honours and awards. Flight 3 Maintenance personnel were awarded a Bronze Commendation for their efforts whilst on Operations. An excerpt from one paragraph of the commendation reads:

Your response to critical and catastrophic defects was first class. Through a combination of sheer hard work and technical excellence, you delivered a near perfect and truly exceptional record of aviation capability.

This award by the highest ranking Australian Officer in the MEAO is the highest level award given to a flight maintenance team. The Commendation articulated the hard work and effort that Seahawk Flights endure in the MEAO and is a source of immense pride and achievement for the Squadron and recipients.

CPOATA B. Berggy
POATA C. Marsh
POATV C. Smith
LSATA G. Chester
LSATV C. Dendle
ABATA V. Hughes
ABATA S. Marshall
ABATA W. Douglas
ABATV L. Mason
ABATV T. Smith

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1 The IRTC is a narrow shipping shipping lane extending 400N Miles between the Saudi Arabian and Yemeni coastlines to the North and Somalian, Djiboutian and Eritrean coastlines to the South through the Gulf of Aden toward the Red Sea.

MRH 90 Single Engine Failure and the Safety Management System in Practice

BY LEUT L SHERWIN, RAN

ABOVE MRH90 helicopter

Background

On the 20 April 2010 MRH90 A40-011, call-sign 'Destrier 11', departed RAAF Base Edinburgh for the start of a three day overland transit flight to 5 Aviation Regiment, RAAF Base Townsville. This proved to be an eventful transit as a violent engine seizure occurred not long after departure from Edinburgh. The following is an extract from the subsequent ASOR:

Aircraft was in transit at 140KIAS with 4 -axis autopilot coupled and power set half a degree FLI below max continuous power at a AUW of approx 9900KG. Without warning the aircraft yawed violently and pitched nose down with a simultaneous audio alarm. Both warning and caution illuminated on MAPs with Initial CWP indications being ENGDF and GOV1 cautions. While FP recovered aircraft control FIRE1 caution illuminated on CWP fleetingly with associated ENG1 fire extinguisher buttons also illuminated (ASOR: 5AVN-059-2010).

The No.1 engine had seized in flight causing total destruction of the No.2 axial compressor wheel rotors and extensive damage to the remainder of the engine including debris penetration of the exhaust cowling. On the positive side, the remaining aircraft systems performed as advertised with the FADEC system maintaining 100% Nr (main rotor speed) and the AFCS automatically limiting power to MCP (maximum continuous power). However, considering the violent yawing and pitching moment experienced by the crew and passengers onboard (a maintenance team), this could be described as less than a fail-safe outcome. Given that 350 ft in altitude was lost during the failure and subsequent recovery, the outcome from a low-level sortie profile needs little imagination.

This serious incident led to 5 Aviation Regiment requesting a DDAAFS investigation, suspension of MRH90 flying operations and an engine defect report. With the MRH90 approaching acceptance into service the full resources of the Aviation Safety Management System (SMS) were marshalled to investigate, analyse and resolve what had occurred.

Reliability and the NH90 Fleet

The engine failure of Destrier 11, as it turned out, was not an isolated incident within the NH90 world-wide fleet. An Omani aircraft flying in France had previously experienced an audible bang and fire warning in-flight, which led to an in-flight commanded engine shut-down. Investigation revealed rupture of two rotor blades from the No.2 axial compressor disc and fire damage to the upper deck from engine fuel spillage and ignition (NHI, 2010). Fortunately the aircraft was safely recovered. The Netherlands had also experienced an engine failure; however this one was on the ground. Investigation revealed three rotor blades ruptured from the No.2 axial compressor disc (NHI, 2010). The common thread here was the model and variant of the engine in use and area of damage. Compressor damage discovered during inspection of the same engine model and variant in other countries has confirmed a serious problem and led to an extended suspension of MRH90 flying operations for the ADF.

With so many engine problems from a new aircraft type, which had so

few flying hours, the engine reliability for airworthiness was called into question. It is not just the likelihood of a failure occurring that determines the engine reliability requirements, but also the likelihood of the failure resulting in hazardous engine effects, such as *non-containment of high-energy debris* and *uncontrolled fire* (US CFR 14: 33.75). Such hazardous effects must be extremely remote, with a probability range of 10-7 to 10-9 per engine flight hour. Major engine effects are to be remote, with a probability range of 10-5 to 10-7 per engine flight hour. Therefore the reliability requirements are determined by likelihood and consequence, the two key elements in calculating risk. The manufacturer should demonstrate reliability with engineering judgement and historical experience combined with sound design and test philosophies (CFR 14: 33.75). Experience with the NH90 using this make and model of engine was clearly falling short of these requirements. US FAR Part 29, which falls under Title 14 of the US Code of Federal Regulations (CFR 14), is the airworthiness standard for the MRH90.

Therefore, continued operation of the aircraft without risk mitigation, while failing to achieve the US CFR reliability requirements, meant that the ADF would be operating outside the SMS envelope. What was needed was further investigation and analysis beyond the ASOR of Destrier 11 in order to develop both a short-term and a long-term plan to safely return to flying operations. This is a test of organisational learning and resilience. Organisational learning may be defined as an ability to integrate lessons from the past into future plans and operations, and resilience as an ability to successfully recover from a disturbance to a previous operating state.

Risk Management

Rolling back the clock 30 years to NASA:

'*In the process of officially declaring that the joint* (joint sealed by O-rings in the Solid Rocket Boosters (SRB's); Author's note) *was an acceptable risk, the joint's deviation from design predictions became known, accepted, and expected as an aspect of normal joint performance throughout the NASA hierarchy. The construction of risk developed by the work group became the official NASA organizational construction of risk.' (Vaughan; p. 111, 1996).*

FIG 1. The remains of Destrier 11's number one engine axial compressor discs.

MRH90 engine problems have become a known system risk that needs to be controlled to an acceptable level. For the ADF this will require both technical and operational risk management controls as a short term solution in order to resume flying operations, while awaiting a permanent solution. As disheartening as this period has been for ADF operators and maintainers alike, this is unfortunately the price to be paid for the introduction of new technologically complex systems. Delivery delays that have occurred within the civilian airline industry for the A380 and B787 indicate this problem is not unique. As painful as such delays are for all involved, they are preferable to the history of the De Havilland Comet, the first jet airliner, which became commercially unviable after several catastrophic accidents.

Technical risk management controls will include an STI for more regular and rigorous engine inspections to reduce the likelihood of an in-flight engine failure occurring. Operational risk management will see the introduction of more stringent single-engine flight profile procedures, similar to civilian Category A profiles, to reduce the consequences from an in-flight engine failure. Together, the system risk will achieve a satisfactory level for the resumption and continuation of operations while awaiting a permanent solution. It should be borne in mind that a degree of uncertainty is always associated with any risk management approach, irrespective of whether it is qualitative or quantitative.

Challenges Ahead

So why can't the military just crack on? Two things that come to mind are OH&S law and product liability. Most people are reasonably familiar with the concept of employer duty of care under OH&S law, which is why we predominantly operate to a low level of risk for safety as determined by the AVRM process. Product liability and *assumption of risk* is another matter. In the second half of the twentieth century the philosophy of the courts changed from 'buyer beware' to 'seller beware' (Gesell & Dempsey, 2005). This was due to the increasing complexity of technology and the recognition that consumers could not be expected to understand all the workings of products they purchase (Gesell & Dempsey, 2005). However, if a customer has an accident while knowingly operating a defective product, then the manufacturer can claim *contributory negligence* or *assumption of risk* by the customer as a defence against liability. Consequently Test and Evaluation (T&E) is inextricably linked not only with Quality Management (QM), but also manufacturer liability (Reynolds, 1996; Gesell & Dempsey, 2005).

With this in mind, further T&E of the engine and rectification is needed to improve the

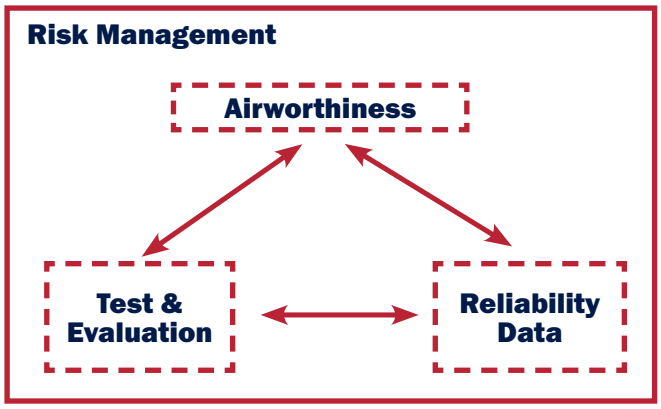


FIG 2. Holistic SMS – Functional relation between parts and the whole.

reliability data for the risk management purposes of meeting user's needs within the envelope of our SMS. The engine manufacturer has gone back to the test bed in order to investigate this problem.

Rolling back the clock again... NASA launched nine space shuttles in 1985 and seven of them exhibited erosion of the O-rings after the SRB's were recovered and inspected (Vaughan, 1996).

After each of these flights, concern escalated at Marshall and Thiokol about the O-ring problem. Memos were flying back and forth between the two organizations, a full presentation about the problem was made to senior administrators at NASA Headquarters, and O-ring Seal Task Forces were formed at both sites to try to resolve the problem. Yet flight continued.' (Vaughan; p. 153, 1996).

The Challenger Shuttle accident occurred early 1986.

The MRH90 may not be at risk of catastrophic in-flight failure; however the focus is once again on an organisation's ability to learn safely. Today the ADF, like 30 years ago for NASA, is under pressure to introduce a developmental vehicle into service. From an operational risk management perspective, single-engine flight profiles represent a simple linear logic approach. A multi-event logic approach reveals additional complexities, such as loss of aircraft control due to inappropriate human reaction following an emergency (US FAA System Safety Handbook, 2000). Military aircrew would recognise this problem as one associated with flying training and proficiency, which arises during times of low serviceability rates. The MRH90 project was already experiencing a low flying rate prior to the engine failure in April. Therefore within the confines of additional servicing on a low flying rate, and with the pressure of ramping-up towards acceptance into service, operational risk management will need to ensure an adequate level of training and proficiency for handling the primary and foreseeable secondary effects of an engine failure in addition to flight profile restrictions.

FIGURE 3. The End State – A safe return to operations.

While the Sea King and Blackhawk helicopters are still operational, the ADF has the luxury of proceeding with the MRH90 towards acceptance into service without compromising the integrity of the SMS. A long term solution for the MRH90 engine is needed so we don't head down the path of accepting O-ring erosion.

Postscript

This article was originally drafted while MRH90 flying operations were suspended. As of late July the suspension of MRH90 flying operations was lifted and flying operations have resumed. This was initially only with contractor trained aircrew, but has now progressed to include training of ADF aircrew. Some 60+ flying hours have accumulated in a little over a month, with the availability of trained aircrew often the limiting factor.
An organisational learning approach has been applied in the return to flying with a strict regime of temporary technical and operational risk management defences, in the form of additional inspections and operating limitations. Evidence-based decision making will be used to eventually lift the additional restrictions in place, with an expected return to normal operations early 2011.
The engine manufacturer is currently directing a considerable amount of effort towards engine re-design to improve reliability and mitigate risk. A permanent solution is expected in time for OCM1.

References:

ASOR: 5AVN-059-2010.

FAA (2000). FAA System Safety Handbook. Chapter 7: Integrated System Hazard Analysis. United States Department of Transport; Washington.

Gesell, L. E. & Dempsey, P. S. (2005). Aviation and the Law (Ed.4). Coast Aire Publications: Arizona.

NHI (2010) NH90 RTM322 engine incidents: Status Report V2 – 08/07/2010 (Update of status report issued on 28/05/2010).

Reynolds, M. T. (1996). Test and Evaluation of Complex Systems. John Wiley & Sons: West Sussex, UK.

United States Electronic Code of Federal Regulations: 14: 31-33 AIRWORTHINESS STANDARDS: AIRCRAFT ENGINES, 33.75 Safety Analysis.

Vaughan, D. (1996). The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA. University of Chicago Press: Chicago.

Turbulence Explained – a Simple Guide to Understanding One of Aviation's Biggest Hazards

BY LEUT A BULTERS AND LEUT A DICKENSON, RAN

Turbulence is a term used widely in the aviation and meteorology world, but to accurately explain the how and why of turbulence is a much more difficult task. This article will seek to do this in a simple manner, along with explaining the more common types of turbulence found in and around the Nowra local area and HMAS Albatross, where the RAN Fleet Air Arm (FAA) is located, and the basic rules for forecasting turbulence in Australia.

Simply put, turbulence results when bodies of air moving at different velocities meet, resulting in an erratic movement of parcels of air, often without any visual indications. When there is no visual indication this is called Clear Air turbulence (CAT). Due to the lack of visual indicators CAT can be difficult to detect and it is hazardous for air navigation due to the sudden movements of the aircraft as it crosses the boundary between the air parcels moving at differing velocities and/or directions. Turbulence can also result in and around cloud, however given the visual indication of cloud this is easier to detect and avoid.

Mountain Waves – This mechanical turbulence results when an airstream is forced to rise over mountains, forcing an excitation of internal gravity waves. These gravity waves result in unusually large upward and downward velocities and accelerations on the lee side of the mountain range, thus turbulence. In some situations mountain waves are evidenced by cloud. In particular, if the flow over the mountain range is moist and the upward displacement on the lee side is such that condensation occurs, then lines of Lenticularis cloud (high level lens shaped cloud) parallel to the mountain range can occur on the leeward side (Fig 2). An excellent and very common example of this is Mt Fuji in Japan. The turbulence that occurs on the lee side of this mountain is well documented, and can be so severe that it has resulted in the break-up of planes in the past. When this cloud occurs as lines it can often be more easily seen on a Satellite picture. Another visual indication is the presence of cloud with several wave like formations at the top surface of the cloud (Fig 3)

INTENSITY	AIRSPEED FLUCTUATIONS (KTS)	G-LOAD (G)	VERTICAL GUSTS (FT/MIN)	AIRCRAFT REACTION	REACTION INSIDE AIRCRAFT
Light	5 – 14.9	0.15 – 0.49	300 – 1199	Rhythmic bumpiness. Momentary changes in altitude and attitude.	Little effect on loose objects.
Moderate	15 – 24.9	0.50 – 0.99	1200 – 2099	Rapid bumps or jolts. Appreciable changes in altitude and attitude.	Unsecured objects move. Appreciable strain on seatbelts/harness.
Severe	>25	1.00 – 1.99	2100 – 2999	Large abrupt changes in altitude and attitude. Momentary loss of control.	Unsecured objects are tossed about. Passengers violently forced against seatbelts/ harness.
Extreme		> 2.00	> 3000	Practically impossible to control aircraft. May cause structural damage.	Unsecured objects are tossed about violently. May cause injury to passengers/aircrew.

FIG 1. Turbulence classification

Wind flow over a mountain range will not always result in mountain waves. These waves will best be developed if the mountain range is long (if it is only a short mountain range, the air stream will take the shortest route around the mountain, rather than over it), and if the wind is roughly perpendicular to the mountain ridge through a relatively deep layer. In addition, if the mountain has a gentle windward slope and a steep leeward slope this will aid in the generation of mountain waves. As a general rule, the wind speed should increase with height, and finally the wind speed must be above a critical value. If the wind is not above this value, than it will simply be blocked by the orography rather than surmounting it. This critical value varies from range to range.

Due to the location of ALBATROSS, mountain waves are a common occurrence over the airfield and local area. The Cambewarra Mountain range lies to the north, and the Turpentine Ranges lie to the south-west. Mountain waves are most frequent during the winter and early spring months when the synoptic flow is from the west. As a guide, if the wind exceeds 25kts perpendicular to the ridge at the height of the ridge level, then moderate turbulence is forecast out to 150 miles on the leeward side of the range.

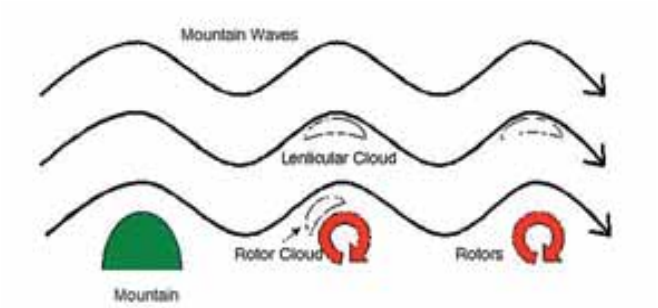


FIG 2. Schematic of Mountain Waves and associated Lenticular Cloud and rotors

If the wind exceeds 50kts, then severe turbulence is forecast out to 150 miles on the leeward side of the range.

Vertical Shear – This results when the wind strength differs vastly with altitude. This can be evident in cloud formations known as Kelvin-Helmholtz instabilities (Fig 4) but can also be evident as CAT. As a general rule throughout Australia, severe turbulence will be forecast due to vertical shear when the wind speed changes by more than 10kts over a 1000ft deviation in altitude.

Horizontal Shear – This is very similar to vertical shear, but it occurs when on a horizontal plane, whereby the wind strength differs vastly over a distance on that plane. This occurs more in an anticyclonic flow as there is an imbalance of the Coriolis force and the Pressure gradient forces, which results in instability. Due to the small scale forecasting of the Nowra and ALBATROSS local area, it is rare to forecast this particular type of turbulence. However, horizontal shear can also occur with strong wind gusts, and as a result of Nowra's orography, whereby the steep sides of the Shoalhaven river valley forces funnelling of the wind, making it much stronger than the surrounding wind. This also occurs most frequently in winter and early spring months when strong Westerlies persist. As a general rule, severe turbulence will be forecast in Australia when wind speed changes by more than 20kts over one degree of latitude.

Thermal Turbulence – As the name suggests, this turbulence results due to the ascension of warm air, which is more buoyant than the environment. As radiative heating occurs, air in contact with the surface is warmed and this results in warm air rising and cooler air descending. This turbulence can vary from gentle ('thermals') through to severe. If the air is moist, as it rises condensation will occur resulting in the formation of Stratocumulus, Cumulus or Cumulonimbus cloud. As a general rule, moderate turbulence is forecast in and around Cumulus, whereas severe turbulence is forecast in and around Cumulonimbus. This is due to the violent up and downdrafts that are associated with thunderstorms.

Although cloud may not be evident, thermal turbulence may still be occurring. During the summer months this turbulence will be more active, particularly in the afternoons with light winds, as a strong flow will break up the currents. In the Nowra and ALBATROSS local area, thermal turbulence is usually coupled with cloud formation due to the proximity to the ocean and the afternoon sea breeze which provides moisture for cloud formation in the atmosphere.

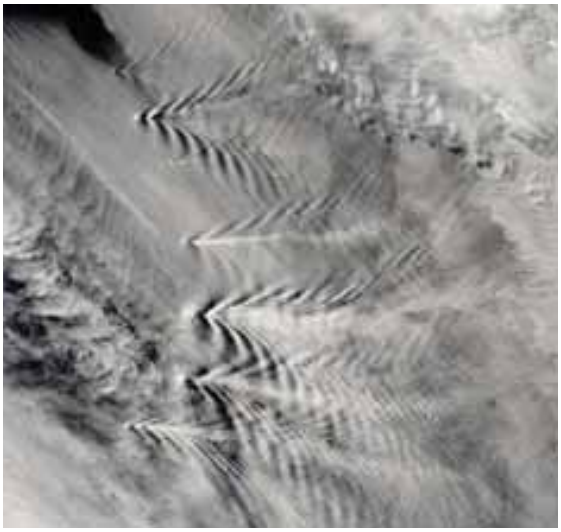


FIG 3. Satellite picture showing Mountain Waves

FIG 4. Kelvin-Helmholtz instabilities

Runway Turbulence – The final type of turbulence discussed here is mechanical turbulence which is specific to ALBATROSS. Due to the sloping terrain to the east of Runway 08/26, when there is a Westerly wind greater than 7 knots, a moderate to severe downdraft occurs at the east end of this runway. This turbulence presents a hazard to aircraft on final approach. As this is a promulgated airfield hazard, it is never addressed in routine forecasts.

This completes the definitions of turbulence that are most commonly expected over the Nowra local area (and in general). The most important thing to remember is that turbulence is rarely visible, and thus can present one of the most serious hazards to air navigation and safety. At ALBATROSS the Nowra Weather and Oceanography Centre (NWOC) incorporate the likelihood and severity of turbulence in routine forecasts issued twice daily in conjunction with the Bureau of Meteorology Sydney Regional Forecasting Centre. Turbulence is at times a difficult parameter to forecast because of its complex nature. The NWOC office is currently compiling a turbulence database based on local reports and observations from aircraft operating in the local area. The objective of this database is to be able to accurately forecast turbulence for given weather patterns.

All observations and reports of turbulence can be directed to the NWOC office and they are contactable on (02) 4424 1269.

Lessons Learned for the Fleet Air Arm from 'Das Boat'

BY CMDR B SPURGIN, RAN

A Sydney-based finance journalist named Marcus Padley recently penned a provocative article entitled, 'Lessons From the Bear Market By Harry Hindsight'. The piece discussed risk theory through the eyes of the ill-fated crew of the World War 2 German submarine U-96, from the timeless film classic, 'Das Boat'. I could not resist the opportunity to adapt his theme to our own recent experiences in the Fleet Air Arm (FAA).

Few of my generation missed the iconic 'Das Boat' movie, and most of my friends and I re-watched the epic war film until the VHS tape wore out or broke. The crew of U-96 experienced every conceivable horror from the allied destroyer pursuing it until it was forced to dive below its design depth to escape total destruction. Apart from the movie being a ripping yarn, the mastery of the film lay in its ability to expose the weaknesses in both man and machine as the pressure to perform in difficult circumstances increased.

So what are some of the lessons a World War Two flick can teach us in 2010?

Lesson One: If, as a technician or engineer, you are ever perfectly satisfied with the safety record, maintenance plan or performance of your team, you are probably missing something. Every process can be adapted and improved.

Lesson Two: Behavioural psychology theory informs us that fear is a bigger driver of performance than confidence. The swagger of the Command team of U-96 was shattered when the first successful depth-charge cracked the boat's hull. U-96's past successes meant nothing, and once fear and doubt set in, some of the crew began to question their leader's competence, team relationships frayed and performance suffered. This situation could describe elements of the FAA during and after the SHARK 02 Board of Inquiry (BOI) period. Whilst the memory of that tragedy fades for some, it is critical that we do not forget the lessons learned from the BOI, particularly with the newer members of our workforce who have not experienced such an event. We work hard to ensure they never will.

Lesson Three: Humans take a long time to react to adversity. We are wired to expect success, and when we experience severe setbacks, we are often paralysed by fear. The result is that generally humans are cautious after adversity and more inclined to take risks when a process is working smoothly. As technicians and engineers, we need external policies and mechanisms to ensure consistency in our performance. This is where our maintenance publications and training systems are critical. Too often I read FAA ASORs, Safety Investigation and Routine Inquiry reports that refer to maintainers failing to refer to their publications when effecting repairs or conducting checks on aircraft. We cannot afford to allow complacency into our workspace.

Lesson Four: The best that a traditional safety management system can offer is to look at history and project its lessons into the future. As the CO of U-96 found out to his horror – when he foolishly departed from the U-Boat 'wolf-pack' strategy to increase his chances of sinking more allied freighters – tomorrow is not a reflection of the past but is in fact an unknown about which we can only make educated guesses. We must continue to test our safety systems not just on what we know, but consider 'what-if' scenarios to add rigour to our safety management plans. Embrace change and adapt.

Lesson Five: Do not be afraid to provide authentic – but respectful – feedback to your subordinates, peers and superiors in matters of aviation safety. When lives are at stake, rank is irrelevant. Better to speak out and be proven wrong than stay silent and be right about a safety issue that could have saved lives. In a military culture, this is not always easy, but it is the time to invoke the Navy value of 'courage', and call a 'knock-it-off' if there is doubt.

Lesson Six: Be a good example to your people. Your current subordinates will soon enough be inheriting the 'keys to the FAA', and will do a superior job if their mentors in the Service have demonstrated, in both good times and bad, the signature behaviours of respect for 'people, performance and professionalism.'

One of the most enduring scenes in 'Das Boat' is the moment when the CO is forced to risk the lives of his entire crew by exceeding the design depth of U-96 to dive underneath the depth charges dropped by the allied destroyer that refuses to give up its hunt for the boat. The tension is palpable. Whilst some of the crew are clearly terrified, others pray and most swear, they nevertheless stand firm behind their leader and carry out the order. It is an extreme example of risk, but not so far removed from the scenarios being played out with FAA assets today in the skies over places such as the Middle East Area of Operations and Somalia. The inherently dangerous trade in which we are all involved places a high degree of trust on aircrew and aviation maintainers to conduct their respective roles with safety and professionalism as paramount considerations. It is when under extreme pressure to perform that we can gauge whether our people and equipment are up to the task. The recent performance by embarked FAA flights in several operational theatres reinforces the conclusion that, like the crew of the U-96, we get the job done.

Big Sky Theory?

BY CAPT A WHITTAKER, RAN

The "Big Sky" theory is based upon the expectation that with the relatively low density of aircraft compared to the billions of cubic kilometers of airspace, other than in terminal areas, you'd have to be pretty unlucky to have a mid-air collision. When that theory breaks down, those of us who live to tell the tale often do so with the phrase "and my windscreen was full of…".

Let me give you a few instances of my experiences of the breakdown in the Big Sky theory.

On one particular day back in the early 80s, I was a fairly new Tracker (TACCO) flying an anti-submarine serial in the Eastern Australian Exercise Area with a destroyer escort. On joining, we were informed of a Piper Aztec conducting an anti-aircraft serial with the same ship, but on another frequency. We weren't getting traffic advisory on the Aztec, but we had vertical separation and, although it hadn't been specified, we believed that it was just doing radar tracking runs. Suddenly, my windscreen was full of a huge orange gunnery sleeve! I mean, it filled the entire windscreen and I could almost have reached out and touched it. I have no idea how we missed the sleeve and cable (and we later found out that the cable cutter on the Aztec wasn't working). The gunnery sleeve can be over a quarter of a mile behind and several hundred feet below the towing aircraft. How did this happen? Partly, it was a deficient lookout, but mostly it was poor situational awareness (SA). We hadn't asked for traffic advisory and clearly hadn't clutched into the fact that there was a long cable trailing from the other aircraft. Good SA is never based upon assumptions, and you can't expect all your information needs to be presented on a platter.

Quite some years later, I was flying a AS350B Squirrel from HMAS *Success* during the First Gulf War. We were conducting a surface surveillance sortie in the Arabian Gulf and had descended to low level to identify a vessel just outside Iranian waters. As we were climbing back to 500 ft I was pointing to something on my TACCO's plotting board and as I looked up, my windscreen was full of the plan form of an F-14 Tomcat!

Later discussion led us to the conclusion that, having been at low level off the coast of Iran and then climbing back to height, we had appeared as an air contact coming out of Iran and heading towards the carrier battle group, which had dispatched a combat air patrol aircraft to investigate. We were squawking IFF Mode 4, but the F-14 decided to give us a close visual inspection anyway. That it got so close without me being aware was clearly due to a poor lookout. Instead of maintaining an effective lookout, I had become distracted with the surface plot and was head-down in the cockpit with my TACCO over his plotting board.

ABOVE AS350B Squirrel

The latest of my near-misses occurred when I was Commanding Officer 816 Squadron. I was flying the Chief of Navy (CN) on a Saturday from Sydney to Canberra. It was an 8/8ths blue stunning day, the type of day when you are amazed that people actually pay you to go flying. We were passing to the north of Goulburn by about 10nm, but still monitoring the (CTAF) frequency. Everything was going perfectly to plan and I was chatting casually to CN, until my windscreen was full of a Cessna 172! At that point I think I regaled CN and Mrs CN over the intercom with my mastery of the one word that springs from your mouth on just such occasions. The Cessna had come from low left and was climbing through our height. As Murphy would have it, the aircraft had been outside my line of vision and would have been less obvious for my TACCO, with it coming from below the horizon. But just at that time my TACCO was also making a data input to the navigation system and was head-down. While it would be easy for me to put this down to pure bad luck, the old sporting adage "the harder we train the luckier we get" comes to mind. Although we had done the right things, like giving Goulburn a wider berth on a Saturday where there would more likely be civil flying, it is easy when things are going so well and the weather is beautiful, to get lulled into a false sense of security.

To avoid becoming a victim of the Big Sky theory, there is no substitute for good SA and a vigilant lookout. Luck has very little part to play in this. We make our own luck by remaining alert and working at aviating safely, even when the conditions are conducive to relaxing and just going with the flow.

Aviation Safety in a Sister Organisation – an RAN Contribution (TWO-PART SERIES)

BY LEUT M LYNCH, RAN

In mid 2007 four Royal Australian Navy (RAN) pilots from 723 Squadron were fortunate enough to be selected to undertake loan postings to the United States Coast Guard (USCG). The postings locations were Miami Beach and San Francisco for two individuals to fly the MH-65C Dolphin; the remaining locations were Cape Cod and San Diego to fly the MH-60J Jayhawk. The expected tenure of these posting was between three and four years. Unfortunately I missed out on securing one of these initial postings.

Later on in 2007 it was announced that there were three more loan postings in the offing to the USCG. Once again, I indicated that I was indeed a volunteer and a short time later I was excited to hear that my application for the loan posting had been successful and I was expected to be in the United States (US) in January 2008. My posting was to fly the MH-60J from USCG Air Station Astoria in Oregon; the other two postings were in Corpus Christi and Los Angeles to fly the MH-65C. To be honest I didn't really know a whole lot about the USCG other than that they were responsible for SAR along the US coastline.

First it would be best to describe the AirSta (Air Station) I work at, what we fly, how we are manned and what our mission is. Air Station Astoria is located at the Warrenton Regional Airport in the Pacific North West of the continental US in Oregon State. The AirSta has three MH-60J helicopters which are actually Seahawks (S-70B5) according to the build plate; so they are quite similar from a systems point of view to the RAN's Seahawks. We have 18 duty standing pilots at the AirSta including the CO, XO and OPS (Operations Officer). There are approximately 80 enlisted personnel that are divided into two trades. They are AET which is equivalent to the ATV rate in the RAN and AMT which equates to ATA rate. Interestingly, in the USCG, the maintainers also fly as crewmembers. These personnel fly in the

cabin initially to get a Basic Aircrewman (BA) qualification which will allow them to fly and run the radios in the back on a non operational mission. After a period of time, and when they are assessed as ready, they will enter the Flight Mechanic (FM) syllabus. During this syllabus they will be taught how to winch, day and night, in all weather conditions, to vessels underway or dead in the water. In addition to the vessel work, they are also introduced to working with Rescue Swimmer (RS). The FM designation, once earned allows the holder to stand duty as a member of a SAR crew. The other crew member in the back of the helo is the RS. The RS is the crew member that can be lowered from the helicopter to assist people in distress, whether that person is on board a vessel, in the water or perhaps stranded on the side of a cliff. The RS holds an Emergency Medical Technician (EMT) qualification. The helicopter is flown by two pilots. There are three pilot designations; co-pilot (CP), first pilot (FP) and aircraft commander (AC). The United States Navy (USN) conducts the initial training of Coast Guard aviators consisting of 120 hours of fixed wing training followed by approximately 100 hours of rotary wing training. At this point the newly designated and winged aviator undertakes a type transition course, or what we in the RAN would call an OFT. If selected to fly the MH-60J, the freshly winged pilot with about 220 total hours spends seven weeks learning to fly the helicopter; this consists of about 30 simulator hours and 30 hours in the helicopter. On completion of the transition, they are designated as a CP and it's off to their new unit. To advance beyond CP, you must have 500 total military hours to request entry into the FP syllabus and 700 total military hours for the AC syllabus.

Okay, so now we have some helicopters and crew members, what do we do with them?

The AirSta maintains an aircraft in a serviceable status that will allow it to be airborne to respond to a SAR case or MEDEVAC within 30 minutes of notification of the case. To that end, there is ready crew consisting of an AC, FP or CP, FM and RS that stand duty for a 24 hour period, 7 days a week, 365 days a year.

Since arriving in the US in February 2008, I have flown on over 40 SAR and MEDEVAC cases. What follows is a narrative of four 'typical' cases for our AirSta.

On the evening of 14 July 2010 the SAR alarm sounded; the report was a possible Medical Evacuation (MEDEVAC) of a 55YO woman with severe abdominal cramps on a fishing vessel (F/V) at sea 90 NM off the coast, west of the AirSta. We immediately changed into our flying gear. The water temperature at this time of the year is around 12 degrees Celsius, so we always fly in an immersion suit. I'd already reviewed the maintenance documents on assuming the duty a number of hours before; the helicopter hadn't been flown or touched by maintenance so we made our way out started up and launched westbound. The USCG permits SAR and MEDEVAC launches without signing for the aircraft.

I decided to take the right seat for the case since I had recently seen my CP winch to an underway vessel for training during the day. To be frank, I was not comfortable enough in his ability to conduct the winch so far off shore in what was likely going to be a decent sea state, possible darkness and to a vessel covered with rigging. The weather conditions en-route were overcast at 500', wind 330/25 and visibility 8000. On the transit

I prompted the SAR Mission Coordinator (SMC) to start to gather further details on the patient. Next on the list was getting a rescue checklist started which prepares the cabin and crew members for impending winching and possible deployment of the RS should he be required. I tasked the CP with preparing a winch brief to be given to the vessel as we arrived on scene so we would be able to swiftly conduct the MEDEVAC should that be the course of action we elected to take. A little while later, the SMC contacted us with updated details including the latest position of the vessel and the condition of the patient. We entered the position into the Tactical Navigation System (TACNAV) and set up an intercept fly to point with the vessels speed and course. The updated condition of the patient wasn't exactly what we'd expected.

The latest information on the patient was now a 55YO woman, recent mastectomy due breast cancer, has a tracheotomy and feeding tube inserted, with severe abdominal cramping. With this information I requested the SMC contact the duty flight surgeon to ensure that a MEDEVAC by helicopter was the most appropriate course of action. Again, there was a delay of a few minutes.

On the way to the scene we set the RADAR up to assist us in finding the F/V in conjunction with the flight guidance from the TACNAV. We didn't have any success with the RADAR despite trying different ranges, modes and gain. Alright, now we are looking for a 35' long F/V in a 15' sea state with a lot of white caps only 15 minutes from last light and under an overcast sky.

It sounds like it should have been easy to see, but it really wasn't. We made radio contact with the F/V and told them we would be on scene in a matter of minutes and requested an updated position and asked if they could see us. Their response was that they couldn't see us despite us apparently being within two miles of the position they claimed they were at.

Next in the bag of tricks to find the vessel was to DF on a transmission from them. My CP quickly set up our communications to be able to DF; called the F/V and requested that they give a long count so we could find them. The F/V responded with the long count and my CP marked the bearing on the tactical plot. Rather than flying off the get another bearing cut I elected to fly along the line of bearing to find the vessel, and sure enough, five miles along the bearing there was the F/V. Now we set up an orbit at a max endurance profile and contacted SMC again to see if there was word from the flight surgeon. No news yet. We discussed as a crew the weather conditions, vessel and patient condition and decided from an Operational Risk Management (ORM) perspective that if we were going to do the MEDEVAC, we needed to get moving and get it done with what little light we had left.

I handed the controls to my CP and donned my NVG's in case they would be needed for the hoist, but more importantly for the transit to the hospital.

Once again we prompted the SMC, this time we were advised that the MEDEVAC was 'advised'. Now it's my decision, based on the information we have, the conditions and the crew discussion I called for the next part of the rescue checklist. The F/V was underway at about six knots into the wind and 12-15' swell. I put the aircraft in a position, keeping station with the F/V at an altitude of 80' on the port side and just aft of the F/V. In this position, with a 30+ knots of wind through the disc, the aircraft was on a single engine fly-out profile. We briefed the evolution and conducted the recovery of the patient using the rescue basket without any problems.

Now that we had our patient, we transitioned to forward flight and set course for a hospital in Portland, a level one trauma care center some 150NM away. To be continued...

End Of Part 1

By FASO

This article provides information on the Op Tempo, the AVRM processes, decision making, preparedness and CRM involved in the USCG. All of these issues are daily occurrences within our own organisation and we do well to heed the lessons learnt from others experiences.

To be frank, I was not comfortable enough in his ability to conduct the winch so far off shore ...

Caption Competition

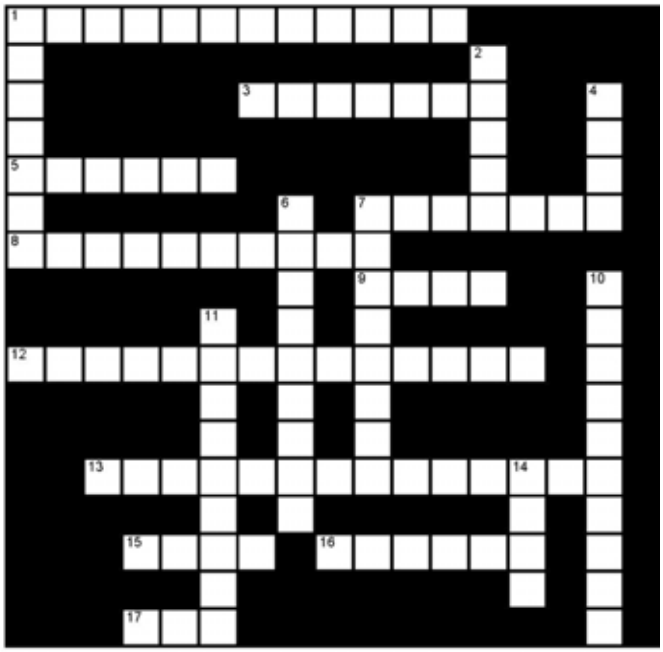
Think of a caption for the photo left and send it to navyairsafety@defence.gov.au Competiton closes 01 March 2011.

The best caption will be published in TOUCHDOWN 1 of 2011

WINNER OF THE JULY 2010 CAPTION COMPETITION:
LCDR M.W Taylor, RAN XO HMAS SIRIUS. LCDR Taylor will receive a Gift Pack from the FAASC. Congratulations.

'50 feet.....40 feet.....30 feet..... big fence.....cars.....retard,retard....'

TOUCHDOWN CROSSWORD CHALLENGE



ACROSS

1. What Type of CLOUD is normally associated with Thunderstorms? (12)

3. An Insufficient supply of oxygen to body tissue is called? (7)

5. Surname of the Author of article found in TOUCHDOWN pg 8 edition no.3 Dec 02 (6)

7. Opposite to Ascend (7)

8. Hearing damage occurs where levels are normally above__decibels (10)

9. Civil Regulator of aviation safety and security in Australia is (4)

12. What is the name of this standard AS/NZS 4360 (1999)_____ (14)

13. Name of the Manufacturer of the Aircraft Type found on Front Cover TOUCHDOWN Jul 09 Edition (14)

15. What is the unit of measurement of wind speed? (4)

16. A line connecting areas of equal/constant barometric pressure (6)

17. Crew Resource Management (3)

DOWN

1. Peanuts Cartoon Character,_____ Brown (7)

2. Navy Fleet Air Arm Safety Cell (5)

4. What sort of creature is a bustard? (4)

6. Bodies natural rhythm is also called _____ Rhythm (9)

7. If an aircraft had a magnetic compass error the accuracy of track keeping would _____ (8)

10. A Spark plug that is inhibited by lead or carbon deposits is called a (10)

11. What is a HABOOB? (9)

14. Aviation Risk Management Program (4)

Crossword Solution

FLEET AVIATION
Safety

SAFELY TOWARDS 2020

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COURSES	DATES FOR 2010 – 2011		
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VERTREP & TRANSFER TEAM	• 01 NOV 2010 • 15 NOV 2010	• 07 FEB 2011 • 21 FEB 2011	• 07 MAR 2011 • 09 MAY 2011
FLIGHT DECK MARSHALLER & HELICOPTER CONTROL OFFICER	• 08 – 12 NOV 2010 • 22 – 26 NOV 2010 • 06 – 10 DEC 2010	• 31 – 04 FEB 1011 • 14 – 18 FEB 2011 • 28 – 04 MAR 2011	• 14 – 18 MAR 2011 • 28 – 01 APR 2011 • 02 – 06 MAY 2011
FLIGHT DECK TEAM	• 08 – 12 NOV 2010 • 22 – 26 NOV 2010 • 06 – 10 DEC 2010	• 31 JAN – 04 FEB 2011 • 14 – 18 FEB 2011 • 28 – 04 MAR 2011	• 14 – 18 MAR 2011 • 28 MAR – 01 APR 2011 • 02 APR – 06 MAY 2011
DRY DRILLS HUET WITH EBS	• 01 NOV 2010 • 17 NOV 2010	• 01 FEB 2011 • 07 FEB 2011 • 14 FEB 2011	• 02 MAR 2011 • 05 APR 2011
DRY DRILLS HUET WITH EBS	• 16 NOV 10 • 23 NOV 10 • 07 DEC 10	• 08 FEB 11 • 15 FEB 11 • 22 FEB 11	• 09 MAR 11 • 15 MAR 11

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