



AUSTRALIAN SOCIETY OF AIR SAFETY INVESTIGATORS

QUARTERLY JOURNAL

Spring 2021



On the move at last!

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Spring 2021

Ladies and Gentlemen,

Last week I undertook my first domestic regional flight for nearly six months. It was a great opportunity to witness the 'green shoots' emerging from our recovery from the pandemic. Whilst airborne, it made me think about a lot of things.



My primary focus was on how ASASI might successfully stage an international ISASI Seminar in Brisbane from 29th August to 1st September next year. I'm sure we all remember face-to-face seminars; where we saw real people and we were able to speak personally with them. Are these events still regarded as the norm, or are they consigned to history like radio operators and navigators? You all received a survey recently seeking your personal thoughts. If you can respond, please, your Executive will be so much the wiser in making decisions to manage this issue on your behalf.

While you're there, do you know any aviation students currently studying at an Australian aviation institution? We still have two prestigious ASASI scholarships available, generously provided by Flight Safety Foundation Ltd. (the BARS Program) and CASA (Flight Safety Australia). Details appear later in this newsletter.

By now you will have all received your annual 2022 ISASI membership renewal invoice. This falls due on 1st January and is renewed directly to ISASI. If you have any issues in renewal, please contact us on www.asasiexecutive@gmail.com

For future editions of our newsletter, we propose to include a '**Positions Vacant**' page. If you know of an emerging position (s), please let me know and we'll publicise it to our membership.

Our volunteer webmaster, Dennis Hill, has enabled a page for our NZSASI mates across 'the ditch' on our website so that you can keep up with what they are doing there; apart from killing us at Rugby!

Finally, may I take this opportunity to thank each and every ASASI member for sticking with us during this tumultuous year of uncertainty and frustration. Things can only get better for us as an industry in 2022 (and yes; my fingers are tightly crossed!)

All the very best for a very Happy Christmas and a safe and prosperous New Year.

Until next time, stay safe.

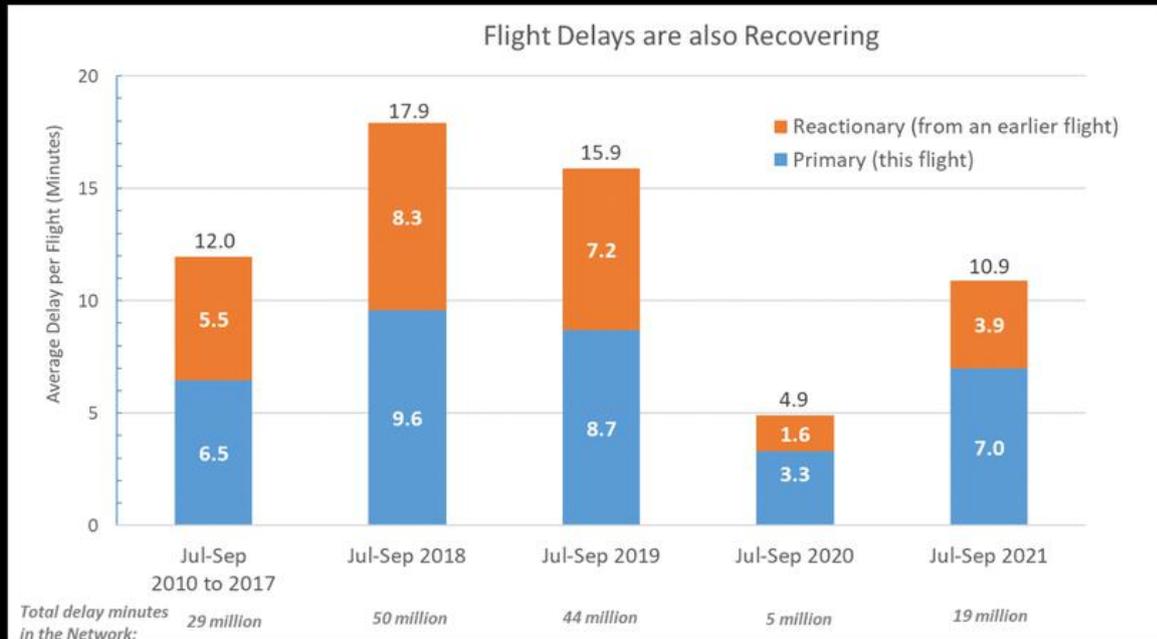
John Guselli
ASASI President

EUROCONTROL Data Snapshot

Flights have recovered this summer, but so have delays. A saving grace is that reactionary delays remain relatively low.



3 November 2021



In a [recent snapshot](#), we showed how checking COVID documents was a significant cause of delays to passengers, up to 0.7 minutes per flight in July 2021. Now looking back over the summer months, despite en-route ATFM regulations being lower than 2019, we see that delays in total have been climbing again. Summers 2018 and 2019 were very poor for delay, with 18 and 16 minutes of delay per flight on average. Summer 2021 is lower than that but, at 10.9 minutes per flight, already close to the 2010-2017 average (12 minutes).

Airlines categorise their delays into primary causes and reactionary delays, the latter caused by delays on earlier flights (of this aircraft, for this crew, or these passengers). The most common primary delays are from airlines' own processes, such as baggage loading, boarding or refuelling. Airport processes (such as check-in), air traffic management and government (such as health checks) make up the remainder. While reactionary delay in theory is due to some original, primary cause, in practice the situation is too complex to be worth splitting 'reactionary' amongst the primary causes.

As passengers, most of us have experienced reactionary delays: arriving at the boarding gate to find the aircraft hasn't yet arrived. It's a problem carried from flights early in the day to those later on. Airlines try to break the chain of delays by building gaps into the schedule, or switching aircraft, or accelerating processes such as boarding to make up lost time. With relatively light traffic this summer, they were able to do more of that, which is why the rate was relatively low (36% of total, rather than 45%).

These solutions rely on luck (can we get everyone boarded quickly?) or are costly in capacity (having spare aircraft). Better to aim to stop the delays at source. That's why the EUROCONTROL Network Manager and all the operational teams at airlines, airports and air navigation service providers work to reduce (primary) delays in the 'first rotation', the first couple of flights each day. 10 minutes of primary delay during the first rotation can cause 40 or 50 minutes in total across the day.

Total delay remains relatively low (19 million minutes) compared to 2018-2019 (45-50 million). But, as the recovery continues, keeping down delays on the first flights of the day needs to be a priority.

Technical Bits: Delays from all causes are monitored and recorded by airlines and airports and reported direct to EUROCONTROL. This data is the basis for these statistics. Regular reports on delays from all causes are available [here](#).

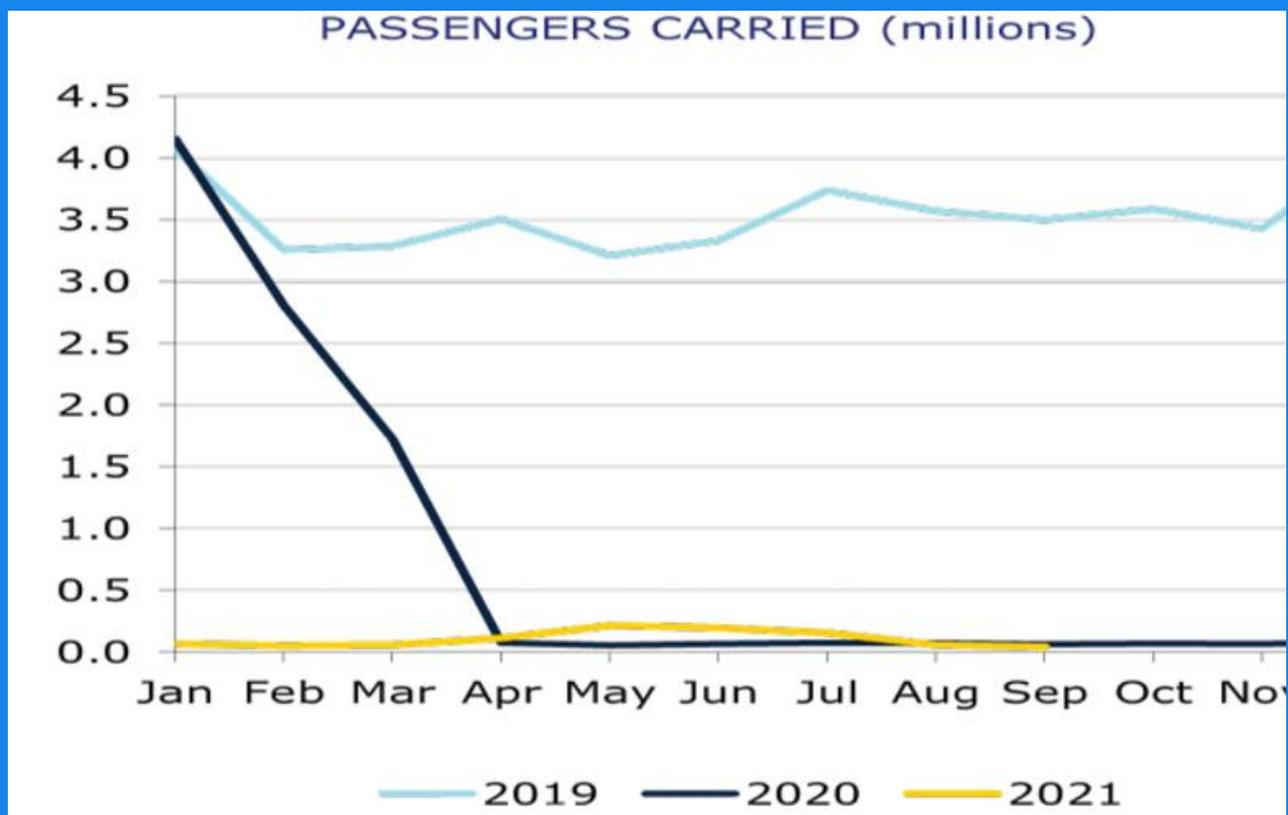
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Meanwhile the State of Play in Australia

BITRE data (at September 2021) revealed that we have turned to corner

	September 2020	September 2021	Change
Passengers carried (million)	0.062	0.042	-32.2%
Freight (tonnes)	74 914	80 125	7.0%
Mail (tonnes)	1 959	1 677	-14.4%
Available Seats (million)	0.327	0.503	54.1%
Flights	3 279	4 000	22.0%



Thankfully, our elected leaders are working tirelessly in the federal Parliament to ensure that all Australians have reason to be optimistic about the future of air travel and the tourism industry.

Crews Recover Ditched Transair Boeing 737 Off Hawaii

by Gregory Polek

- November 2, 2021, 10:32 AM



Salvage experts recover the forward section of the fuselage of a Transair Boeing 737 from the Pacific Ocean about two miles from Ewa Beach near Honolulu, on October 21. (Photo: NTSB)

Search crews have recovered both flight recorders and all major

components of the Transair Boeing 737-200 cargo jet that ditched into the Pacific Ocean on July 2, shortly after takeoff from Daniel K. Inouye International Airport in Honolulu, the NTSB said Tuesday. Operating as Flight 810, the pilots ditched the aircraft after reporting anomalies in both engines. Both pilots survived. The wreckage came to rest on an ocean shelf at a depth ranging from 350 to 450 feet.

“The recovery of the recorders and virtually the entire airplane represents a major step forward in the investigation,” said NTSB chair Jennifer Homendy. “We are so appreciative of the collaborative efforts of the federal and state agencies, parties, and contractors that contributed to this successful outcome.”

An underwater survey of the accident site conducted in July revealed that the fuselage broke into two pieces: the aft section with the wings and tail attached, and the forward section that includes the flight deck. Both engines separated from the wings at impact. The forward landing gear assembly also separated from the fuselage.

Four of the six cargo containers remained in the aft section of the fuselage; crews found the other two containers near the wreckage and a pallet of cargo during the initial search operation.

In the months following the accident, Transair’s insurance provider contracted with several companies to recover the wreckage and cargo. The contractors included the Eclipse Group, which operates the Bold Horizon, a San Diego-based research vessel equipped with a remotely operated vehicle and other underwater retrieval equipment. A California-based barge, the Salta Verde, lifted the two sections of the fuselage and transported them to shore in Honolulu.

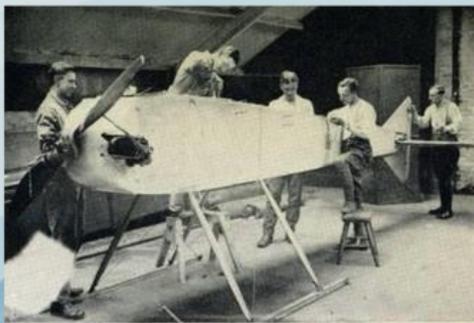
Meanwhile, contractors crated the engines in preparation for their return to the mainland, where each will undergo a teardown examination supervised by an NTSB investigator.

The investigation, which the board expects to complete in 12 to 24 months, will include a comprehensive examination of the airplane structure, engines, systems, maintenance, survival factors, vehicle performance, air traffic control, human factors, federal oversight, and emergency response, said the NTSB.

Dr. Alan Hobbs is a long-term ASASI member and is currently a Senior Research Associate with the National Aeronautics and Space Administration (NASA). Before moving to NASA, Alan was a human performance investigator with the Australian Transport Safety Bureau (ATSB). He has published and taught extensively on the topic of human factors and is co-author with Jim Reason of the book "Managing Maintenance Error: A Practical Guide." He has a Ph.D. in Psychology from the University of New South Wales, and he has provided us an update on some of the significant HF issues associated with RPAS operations.

Unmanned aircraft are in the news now, but they are far from a recent development. During WW1, the allies developed uncontrolled bomb-laden drones to fly one-way missions over the western front. In 1917, the eccentric British inventor Archibald Low developed the first radio-controlled aircraft, a project that was ultimately doomed by human factors. During a demonstration flight for senior military staff, Low's remote pilot lost control of the aircraft while attempting to impress the crowd with unplanned aerobatics.

In 1929, an international agreement signed in Paris prohibited international flights of "pilotless aircraft" unless special authorization was obtained. When ICAO was founded in 1944, the wording from the Paris agreement was included as Article 8 of the Chicago Convention on International Civil Aviation. No doubt the delegates were thinking of the German V1 flying bombs that had been falling on London earlier that year.



Archibald Low's Radio-Controlled Aircraft in 1917

The ICAO Panel on Remotely Piloted Aircraft Systems (RPAS) is updating ICAO annexes to enable remotely piloted civil aircraft to routinely fly internationally despite the limits that have been in place for nearly a century. The panel has representatives from 25 countries, including Australia, as well as members from industry organizations. ICAO uses the term "remotely piloted" to emphasize that autonomous unmanned civil aircraft are not likely any time soon, and for the foreseeable future there will always be a pilot-in-command located on the ground. Air cargo operators are the most likely beneficiaries of the panel's work.

Over the last seven years, I have been part of a small human factors team within the panel that is helping to draft amendments to ICAO annexes and advisory material. Experience tells us that even the most advanced technology or brilliant engineering will come to naught unless human factors are baked in from the start. Part of our work has been to identify the unique human factor challenges for RPAS, and then identify how these challenges might be overcome. Many of the issues are well recognized: the reduced sensory cues available to the remote pilot; the inability to see and avoid without a view out the cockpit window, link latencies, and the potential loss of the control link. In other cases, the human factor challenges of RPAS are more subtle.

One of the first problems we recognized was that the people who were designing control stations appeared to be unfamiliar with how things are done in civil aviation. For example, we saw control stations that displayed airspeed in meters per second, unimportant pop-up windows that obscured critical flight displays, and keyboard controls that required the pilot to perform time-consuming clicks and menu selections to perform routine tasks. A couple of

us developed preliminary design guidelines for remote pilot stations that might help to avoid some of these problems in future systems. If interested, I can send these to you.



Control station for a General Atomics MQ-9 Predator B. www.edwards.af.mil

Our team is developing a chapter on human factors to be included in a forthcoming ICAO RPAS manual. The chapter will include RPAS issues relevant to regulators, manufacturers, operators, and ATM providers. Some of the topics we cover are:

- Human-centered design for remote pilot stations
- Preparation for contingencies, including loss of control link
- Troubleshooting and decision making with ambiguous or incomplete information
- Suggested non-technical skills training for RPAS crew members
- Communication and coordination with distributed teams
- Managing risk when maintenance is carried out on the control station while the aircraft is in flight
- Management of control transitions: andovers between pilot stations, transfers between remote pilots, switches between control links
- Displays to enable the remote pilot to remain well clear of traffic, and avoid collisions

We have already received feedback and suggestions from many reviewers (including friends at the ATSB) and would welcome more comments before public release in a year or so. Get in touch if you would like a copy of the draft. Finally, I should mention that my involvement with ICAO is due to the machinations of our esteemed ASASI president. Eight years ago, John arranged a meeting with the chairman of the ICAO study group on RPAS (Jim Coyne, from CASA) and things took off, so to speak, from there.

Alan Hobbs, MO3425 <alan.hobbs@nasa.gov>

Pilot charged after landing helicopter in Canada town centre to buy ice-cream cake

Investigators have determined trip to Saskatchewan town was 'not an emergency'



Some residents of Tisdale thought the helicopter had arrived because of an emergency.

A man's cravings for a sweet treat have landed him in the hotseat with the police after he landed his helicopter in the centre of a small Canadian town to buy an ice-cream cake.

Residents in the town of Tisdale, Saskatchewan (population 3,000) watched in astonishment on 31 July as a bright red helicopter descended on the parking lot near the town's only Dairy Queen, blowing up clouds of dust and debris as it touched down.

Initially, some residents thought the chopper - painted the same colour as the province's air ambulances - was on the scene for a medical emergency. But when the town's mayor saw the passenger leave the restaurant with an ice cream cake, he realized the aircraft had a different mission.

"Well, I thought somebody must be hungry," Mayor Al Jellicoe told CBC News. "Initially, I thought that's probably not the right thing to do."

Police agreed.

On Wednesday, they said investigators had determined the journey to Dairy Queen was "not an emergency" and had charged the 34-year-old pilot, who has not been named.

The man, from the town of Leroy, had a license to operate the helicopter, but parked it in an illegal spot.

He faced one count of dangerous operation of an aircraft and is scheduled to appear in court on 7 September in the city of Melfort.

The Royal Canadian Mounted Police revealed;

"Investigation determined the landing was not an emergency: a passenger of the helicopter exited the aircraft and entered a nearby restaurant to buy an ice cream cake."

The Mounties always get their man!



COMMONWEALTH OF AUSTRALIA

**REPORT OF CHAIRMAN
OF
BOARD OF ACCIDENT INQUIRY
ON
ACCIDENT TO VISCOUNT AIRCRAFT
VH-RMI NEAR WINTON, QUEENSLAND,
ON 22ND SEPTEMBER, 1966.**

MELBOURNE

Many of us are fully trained to respond to air accidents, whatever the size or situation. We think we know what to expect and we outwardly believe that we can manage whatever comes during the course of the investigation.

Frank Yeend, a former Life Member of ISASI, recalled his arrival at at Nadjayamba Station, 17.7Km from Winton Queensland to investigate the crash of Ansett-ANA Flight 149.

'We were presented with a scene of absolute devastation. The wreckage of the aircraft, in many thousands of pieces, was strewn through light gidgee scrub over a distance of 1.2 miles and the whole area had been ravaged by fire.'

In his own words he graphically illustrated some of the obstacles he encountered, including a hostile environment, maintenance error, the lack of cockpit voice recordings and good old fashioned politics.

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aussieairliners.org

Frank Yeend was an officer of the Air Safety Investigation Branch of the DCA from 1953 until 1975, and Head of the Branch during the last three years of this term. During these 22 years he was involved in many field investigation of aircraft accidents, and in the Boards of Accident Inquiry subsequently established.

This is Frank's recollection of the investigation of a major accident involving the Vickers Viscount VH-RMI. He wrote;



An 'AussieAirliners' copyright image

In the early afternoon of September 22, 1966, I was in our Melbourne office and received a telephone call from the Regional Director in Queensland, Mike Seymour, that an Ansett-ANA Viscount aircraft had crashed near Winton in Queensland and it was believed there were no survivors. My then chief, David Graham, was interstate on duty at the time and so I set about organising the nucleus of

an investigation team. We set off in the late afternoon, first of all to Brisbane to collect additional members and equipment, and then to Winton, arriving at 3.45 a.m. on the following morning.

Winton is predominantly a sheep farmers' town at about dead centre in the State of Queensland, with a population of a little over 1,000 people. It lays claim to being the home of "*Waltzing Matilda*" as Banjo Patterson wrote the song on a nearby station and it had its first airing in the town. It also had quite a good aerodrome, comprising two airstrips on flat open terrain.

VH-RMI had departed from Mount Isa just after mid-day for a scheduled flight to Brisbane, with a landing at Longreach en route. The weather was fine with broken cloud and the captain elected to cruise at 16,000 feet. The flight proceeded without alarm for some 45 minutes and then the aircraft called Longreach to say it was on an emergency descent. In subsequent communications the crew reported fire warnings in two engines and a little later that there was a visible fire in No. 2 engine and that they were diverting to land at Winton. Nothing further was heard until people reported black smoke at a point 13 1/2 miles west of the Winton aerodrome.

The investigation party was taken to the accident site at first light, and we were presented with a scene of absolute devastation. The wreckage of the aircraft, in many thousands of pieces, was strewn through light gidgea scrub over a distance of 1.2 miles and the whole area had been ravaged by fire. The wreckage recovery and examination task was obviously going to demand a herculean effort, but it was done tremendously well over many months by the Group leaders Don Whalley, Colin Torkington, Ray Broughton and Jim Doubleday.

As the investigation progressed, we also brought in assistance from Ansett-A.N.A, the British Aircraft Corporation, Rolls Royce and Dowty Rotol. The Operations Group was headed up by Colin Beech, with assistance at times from people like Ian Leslie, Bob Whitecross, Russ Watts and Paul Choquenot. David Graham also spent some time with us in an oversight role or assistance to me as the Investigator-in-Charge. We had a little trouble early on with the BAC

senior representative, who decided to ignore the rules on security of information, but a quiet word in the right place by David had him recalled and replaced.

The work of the Operations Group went ahead in the usual manner, interviewing eye or hearing witnesses, collecting and analysing the relevant operational documents, compiling the record of radio communication, assessing the weather conditions, looking at the flight crew histories and reviewing the aircraft load and fuel supply. Beyond that, this Group could only wait upon the development of the engineering and medical evidence before setting about a reconstruction of the flight from Mount Isa to the accident point.

The wreckage examination at the scene had to be undertaken with meticulous care, first of all, to reconstruct the sequence of what was obviously an in-flight failure. The port outer wing and No. 1 engine, although close to the main impact area, were located in a distinctly separate area of impact. We already knew of the pilot's report of an in-flight fire and so a difficult, but very important aspect of the examination was to distinguish between the evidence of in-flight fire and the effects of the post impact fire. Although the accident site was in an isolated area and so we could work largely untroubled by public visitors, working in the open for long hours, even at this time of the year, was very trying.

After two weeks of this we decided to pick up all the vital parts and move them by truck to Melbourne. Here we had rented an old wool store in Footscray and the task of putting the pieces back in their conventional relationship began in earnest. It was not long before the hard evidence of an in-flight fire commencing at the rear of the No. 2 engine, progressing into the wheel bay and then into the adjacent fuel cell, became very apparent. At the same time, and with the help of the Aeronautical Research Laboratories, the port wing main spar became the focus of close study.

It emerged that the upper boom of this single spar wing had failed when its strength had been reduced by heat to only about 12% of the normal strength. The lower spar boom then failed under overload and the wing separated when the aircraft was at a height of about 4,000 feet. The real tragedy, of course, was that the aircraft was then within 5 minutes of landing at Winton. It may have been possible to put the aircraft down on the open country near the accident site, but there was no way the pilots could have known how extensive was the fire in the aircraft and thus how immediate was the emergency.

The investigation of this accident took a little more than six months and then there were the lengthy processes of the Board of Accident Inquiry under the chairmanship of Sir John Spicer, assisted by Bert Ritchie of Qantas, Frank Ball of TAA, Col Griffin of Ansett-A.N.A. and Tom Air of the Department of Supply. The Board first sat on April 21, 1967, some 7 months after the accident and the counsel assisting were Charles Sheahan QC and Alan McCracken, both of Brisbane. Wally Campbell QC - later Governor of Queensland - appeared for Ansett-A.N.A., Gordon Samuels - later Governor of N.S.W. - for the British Aircraft Corporation, Ned Williams QC for the Department of Civil Aviation, Bill Crockett QC for Godfrey Engineering Products and Arthur Pearce for the Australian Federation of Air Pilots.

For the most part the inquiry was conducted in Brisbane, with short adjournments to Melbourne and Winton, to view the wreckage, the accident scene and to hear evidence from some of the local witnesses. This was the first accident investigation in Australia that had been aided by information from a flight data recorder. It was a rather crude seven parameter scratch recorder and had been severely damaged by fire and impact but, nevertheless, we obtained sufficient information to be able to accurately reconstruct the final flight path of the aircraft right up to the accident point.

In this Inquiry a recommendation of mine, that the investigation team should support the counsel assisting the Board rather than the counsel for the Department of Civil Aviation,

was adopted. In earlier inquiries there had been some conflicts of interest and some compromise of our position as independent investigators. The new arrangement worked well but, again, I had to spend several days in the witness box, outlining the scope of our investigation and explaining the logic of our findings.

Having established that the fire in the air associated with No. 2 engine caused the wing failure and the subsequent impact with the ground, of course, we had to discover the source of the fire. Because the Viscount had a pressurised and air-conditioned cockpit and cabin, there was a need for a continuous supply of air under pressure to the under-floor conditioning units. The pressure air was supplied by air pumps or cabin blowers, taking power from 3 of the 4 engines, including No. 2 engine. These air pumps operate at very high r.p.m., with very close clearances and so the bearings are continuously fed with an oil supply via an oil-metering unit, bolted to one end of each pump.

The wreckage examination revealed that the fire in flight had started in the cabin blower powered by No. 2 engine. Apparently a minor metal failure in one of the pump lobes had set up a vibration which caused the 5 studs and nuts securing the oil meter to back-off, allowing one end-bearing of the lobes to come free. This induced very high friction heat in the blower which ignited the oil being supplied to the bearing. The fire then spread into the adjacent wheel bay and from there into the front cell of the fuel tank between Nos. 1 and 2 engines. This fuel cell was more than half full of fuel and it lay immediately adjacent to the wing main spar.

The initial fault in the cabin blower and the progression of the fire most probably commenced not long after the take-off at Mount Isa, but the cabin blowers are installed rear of the fireproof bulkhead and thus outside the fire sensing zone of the engine compartment. The failure of one cabin blower of the three operating would not have affected the air supply significantly and the engine itself would continue to operate normally, at least until the fire had grown to large proportions. In the latter stages of the flight, the fire and smoke on the port side of the aircraft became visible from the cabin, but by this time the softening of the wing spar would have progressed to the point where a catastrophic failure was imminent. The attachment of the No. 2 blower oil metering unit was effected by 5 threaded studs in the body of the unit upon which five castellated nuts held secure a cover plate.

In turn, these castellated nuts are secured by a copper locking, wire passing through each to prevent unwanted rotation of the nuts or the studs. In the wreckage examination only one stud remained and none of the nuts, but obviously there was a strong presumption that, although there was a severe vibration set up by the blower lobe failure, the loss of the studs and nuts probably occurred because the required locking wire had not been put in place during the last overhaul of the blower.

The Board of Inquiry listened patiently to all of this rather complex engineering evidence, but eventually submitted a report to the Minister and through him to Parliament, which adopted our conclusions entirely. This report was tabled in Parliament on October 17, 1967. In typical fashion, the Chairman lavished great praise on the investigating officers and then turned round to criticise our presentation of evidence on a matter which was not only minor but based upon a complete misconception of the situation. The Minister for Civil Aviation at the time was Reg Swartz and so we had him point out this misconception in his tabling statement.

As a result of this accident several changes to operating and maintenance procedures were made by Ansett-A.N.A and by the contracting organisation responsible for the periodic overhaul of the cabin blowers. The accident also emphasised the need for airline aircraft to carry cockpit voice recorders, as well as flight data recorders, particularly to cover accidents where the flight crew are not survivors. Within a couple of years most airline aircraft in Australia were fitted with this type of equipment.

A Helicopter for Every Taste

From Airbus Helicopters - Dubai, 16 November 2021

When a valued customer specified that his new helicopter must have an interior that was fully vegan, Airbus Corporate Helicopters' (ACH) design team rose to the occasion. The resulting ACH145 has now been delivered to German construction entrepreneur Dr Urs Brunner who insisted on the requirement at the urging of his wife, ethical fashion pioneer Daniela Brunner.



Its cabin is fitted with ACH's clean and modern ACH Line interior configuration in a grey theme but the leather elements essential to its luxury feel are replaced with Ultraleather which captures the visual and tactile leather experience with comparable durability.

Items that had to be specially designed and fabricated in the replacement material include the six passenger seats, central storage cabinet, rear partition and cockpit controls cuffs.

Ms Brunner, founding owner of specialist fashion house Giulia & Romeo, which has no animal products involved in its range and donates all its profits to animal welfare, wanted the helicopter to be consistent with her ethical values.

Head of ACH, Frederic Lemos, said: "We're very proud of our team's work in creating this bespoke ACH Line interior. The material that we used is certified for aviation use and is hard wearing, but it can only be stretched in one direction which means it is a challenge to work with, particularly on the seats.

"This is where the craftsmanship of our hands-on team became crucial and I am delighted to say that we found a practical way to meet our customer's desires which also looks superb."

Dr Brunner, an experienced helicopter and fixed-wing pilot, said: "We both greatly appreciate the skill and imagination that went into devising and installing this interior."

Could flying electric ‘air taxis’ help fix urban transportation?



Vertical Aerospace's air taxi, which is predicted to be in city skies in the mid-2020s. Photograph: Vertical Aerospace

Amy Crawford

Mon 25 Oct 2021 23.00 AEDT

The megacity of São Paulo is home to more than 22 million people, most of whom must endure its notorious traffic to get anywhere. For decades, however, corporate executives and the super-rich have soared above these congested streets in one of the world's largest fleets of urban helicopters, which make as many as 1,300 flights every day. While the choppers may be – as one businesswoman declared – “a necessary tool” for some, others argue they are little more than a carbon-belching nuisance.

“Helicopters are a massively noisy, polluting form of transportation,” said Marc Tembleque Vilalta, a vice-president at Avolon, a Dublin-based aircraft leasing company that sees the São Paulo helicopter scene as ripe for disruption. Last month, the company signed a deal to begin supplying a Brazilian airline with electric air taxis, or eVTOLs (short for “electric vertical takeoff and landing”) by 2025.

The aircraft at the center of the deal is the VA-X4, a zero-emission five-seater manufactured by the UK company Vertical Aerospace. With a battery only 20% to 50% larger than an electric sedan's and a range of 100 miles, it claims to have a lighter environmental impact than any existing form of air travel. Rides will also be accessible even to people who don't count themselves among the business elite, according to Avolon, which says that initial pricing will be on par with land-based ride-hailing services, with a target of about \$1 a passenger mile.

“We will see helicopters being the first disrupted market, but longer term we see eVTOLs disrupting automobiles,” Tembleque Vilalta predicts. “These trips will be a fraction of the cost of a helicopter at a fraction of the time of a taxi.”



The VA-X4 is a zero-emission five-seater air taxi Photograph: Vertical Aerospace

It's an optimistic claim, one that might conjure thoughts of flying cars, that perennial cliché of science fiction. But Avolon, which followed its São Paulo deal by announcing a partnership with Japan Airlines, is only one of several companies now in a very real race to meet the demand for quieter, safer and less-polluting urban air travel.

They include international names like Honda and Airbus as well as startups such as the German firm Volocopter, which has agreements to bring eVTOLs to Paris and Singapore in the next few years, and to supply Japan Airlines with air taxis and cargo drones. Vertical, maker of the VA-X4, has received millions in grant funding from the British government and plans to float on the New York Stock Exchange this year. Put it all together and, according to Morgan Stanley, eVTOLs represent a global market that could be worth up to \$1tn by 2040.

The coming eVTOL revolution is partly premised on environmental friendliness: if its battery is charged with renewable power, an eVTOL's operation will be carbon-neutral. Even if the grid is supplied by coal, Avolon has calculated that charging a VA-X4 would still generate no more than a fifth the emissions of a comparable helicopter.

There is research that backs up claims that electric air taxis may sometimes be greener than ground-based automobiles. A team at the University of Michigan recently calculated that a fully loaded eVTOL with three passengers would have 52% lower emissions than a gas-powered car and 6% lower than an electric car, given the cars' average occupancy of 1.5 people. The vehicles “offer fast, predictable

transportation and could have a niche role in sustainable mobility”, according to the study.

But the buzz around eVTOLs has also stirred up concerns that so-called “urban air mobility” may be just the latest distraction from cities’ real problems and that, despite promises that this new mode of transportation will be both accessible and climate-friendly, eVTOLs may actually contribute to the inequities and environmental ills plaguing urban areas around the world.

“There are all kinds of problems right now that we need to figure out, before we start fussing around with this,” said Geoff Boeing, a professor of urban planning at the University of Southern California, who argues that cities should focus on expanding and improving public transit and pedestrian and bike infrastructure before they open their skies to “transportation segregation, where if you can pay for it, you can skip the line”.

Kevin DeGood, director of infrastructure policy at the Center for American Progress, a liberal thinktank, went further in a 2020 report that came out strongly against the “techno-utopian” dream that eVTOLs represent. “Unfortunately, flying cars represent the technological apotheosis of sprawl,” he wrote, arguing that their adoption “will unleash development of pristine lands heretofore unattractive because of the limitations of distance and travel time”.

The idea that transportation advances exacerbate sprawl is backed up by research. As speedier modes have been introduced over the centuries – from trains to streetcars to personal automobiles – workers’ typical commute times tend to remain stable, at about 30 minutes. That’s because faster options prompt people to move further from city centers. The principle, known as Marchetti’s Constant, has shaped the development of cities around the world for thousands of years. It’s what makes the modern suburbs possible. But suburbanites have a greater impact on the environment than city-dwellers in a dense urban core, and the difference is even greater for distant exurbs.

“You’re now living in a place that probably doesn’t have as good public transit, and you probably need to drive to most places,” said Elizabeth Irvin, a transportation analyst at the Union of Concerned Scientists, a left-leaning science advocacy group. “There might be a need to build more roads, and it all has a greater impact on land that was previously natural areas.”

Beyond land use, mass adoption of this new technology could have unintended consequences for overall fossil fuel consumption even if it does lure drivers off the road. Reducing congestion can paradoxically increase traffic, if it makes driving more attractive to people who would have previously chosen other modes – a phenomenon known as induced demand. “Certainly looking to replace combustion engines with electric vehicles is a positive,” Irvin said. “But from an environmental perspective, it’s just not the whole picture.”

Still, city leaders around the world see an advantage in preparing for the apparently inevitable arrival of eVTOLs and for whatever unintended consequences might come along with them.

Like São Paulo, Los Angeles is a sprawling megalopolis known for its monumental traffic jams, which celebrities and business tycoons have long avoided with helicopters. That makes it a prime target for eVTOL developers, a fate that Mayor Eric Garcetti has embraced. Last year, LA teamed up with the World Economic Forum to produce a report called Principles of the Urban Sky, laying out guidelines and goals for urban air policy and regulations. And last December, Garcetti announced the creation of a local initiative to prepare for an eVTOL introduction as soon as 2023.



Congestion on a highway in Los Angeles, California, U.S. Cities are searching for climate-friendly ways to improve urban mobility. Photograph: Mike Blake/Reuters

Los Angeles learned hard lessons from the sudden appearance of other new transport modes, said Sam Morrissey, executive director of the non-profit Urban Movement Labs, which Garcetti created in 2019 and spun off from City Hall last year. Studies have shown that ride-hailing services draw riders from transit and make automobile traffic worse, as drivers cruise around waiting for fares. Meanwhile, e-scooters stirred up concerns about safety and confusion over whether they belonged on the sidewalk or the street. Creating an eVTOL policy in advance could help the city avoid those pitfalls and take advantage of opportunities to improve overall transportation equity and sustainability.

“We have an opportunity to plan for this, so we’re exploring the best way to integrate this new technology into the existing transportation fabric,” said Clint Harper, the non-profit’s urban air mobility fellow. “We have gaps in the current transportation system that maybe we can be of service in trying to close.” That could mean requiring vertiports at train stations, or using eVTOLs to alleviate freeway traffic by combining air mobility with a congestion pricing scheme for cars. New revenues could even fund fare-free buses or trains.

As we recommence travelling by air, spare a thought for our cabin crew. Sue Rice illustrates for us, some of the issues that they are dealing with right now.



As we approach the conclusion of another year, generally there is time for reflection on the year that was. Given the events of the past 18 months to two years it would also be reasonable to conclude that in our general community here in Australia we have so much to look forward to in 2022. Although there is continuing to be some division in certain sectors, as a whole we are moving towards opening up our borders to interstate and international visitors.

At the time of writing things are really starting to pick up in our commercial aviation industry. Across the broad spectrum of airline operators in this country we are seeing enormous Cabin Crew recruitment programs being implemented. Aircraft are coming out of mothballs and receiving their mandatory maintenance to ensure they are compliant and airworthy. Aircraft maintenance engineers are doing what they always do and getting on with the job. Pilots are being recruited, trained and re-trained. The simulators and the instructors will be working overtime to meet tight schedules that will see aircraft back on regular routes. Still with some limitations on destinations but nonetheless moving passengers around this great country of ours and overseas.

For us this raises the enduring topic of Cabin Crew Emergency Procedures Training. Whilst previously this year there was reference made to maintaining currency for CC who had not been onboard for quite some time. Or with a long duration between flights. Although they will likely have a mandatory 'refresher course' at some stage, the challenge for industry to measure is just how current and 'on the ball' CC will be.

There has been quite an exodus of individuals from industry during the unsettled times of COVID 19. That can only translate to a loss of knowledge and skill among aircrew within the airlines. As already mentioned, in ramping up operations the operators are looking at recruitment. There-in lies a potential risk. No doubt there will be great excitement within Training Organisations and airline operator training departments; once again having crew walking the corridors and filling classrooms. As always, the learning of practical skills and the opportunity for implementation of those skills is a top priority. It follows then that the better the quality of the facilities and equipment the better the skill level and knowledge of the crew member.

With the influx of new recruits into operations the challenge for operators will be to ensure that there is a good mix of experienced crew onboard to encourage and guide the fresh, naïve crew. Having flagged this, it has to be acknowledged that by expecting crew to undertake this task it will most likely place extra stress upon crew who are not formally trained and who may be trying to wrap their own heads around being back on board. In the absence of formal onboard training for many recruits, and the environment of the cabin being so very different to any other workplace, all CC will need all the help they can get.

For a multitude of reasons indications are the travelling public may well be more assertive these days. That in itself may prove problematic for experienced and inexperienced CC.

Hopefully airline operators will support their crew in the rare likelihood they are involved in any unpleasant encounters. There seems to be proliferation of reports coming out of the USA in regard to Unruly and Disruptive Passengers. These situations are disturbing for the staff involved and those passengers in the vicinity, whether at the boarding gate or onboard. Fortunately, here in Australia our legislation is strong and clear. And for the most part people have respect for crew and the environment of the cabin.

Reference training, CASA is producing timely and informative documentation that all Cabin Crew, CC Course Development Staff and CC Trainers would benefit from reading. The Cabin Safety Bulletins are readily available on the website:

<https://www.casa.gov.au/aircraft/cabin-safety>.

They have recently published No.25 & No.26. Both are relevant and contain invaluable references and information. One of the advantages of CASA documents is the references that are listed provide greater understanding and/or background as to why decisions are reached and recommendations made.

Industry worldwide it appears is moving forward with a 'Business as Usual' approach. Air Shows are back in major cities with the Big 3, Boeing, Airbus and Bombardier going gangbusters. Finding operators out and about enjoying the freedoms of increasing their fleets. The Chinese and the Russians are also manufacturing engines and aircraft for sale on the open market. While some operators are slowly but surely demolishing their fleets, quite literally, seems some A380's may have gone the way of the Dodo with a number of airlines. Whilst other A380's are being spruced up ready for continuation of operations.

With foreign operators having been up and running for quite some time we are beginning to see the resurgence of various documented incidents. This could provide sufficient justification for raising the training standards for current and newly recruited Cabin Crew.

It has been contemplated for many years, we train individuals to enable them to respond effectively to an abnormal situation and possibly save lives, including their own - but we hope it will not occur.

Stay safe everyone.

Compliments of the Season and may 2022 bring good health, great happiness and success to one and all.

Yours in Safety

Sue Rice



Meet our New Member

In each edition we attempt to demonstrate the diversity of practical and academic expertise within our Society. For this Spring Bulletin, ASASI is delighted to introduce our newest member.

Each new member brings a different facet of specialisation to ASASI and we look forward to meeting them and sharing their experiences. Please make them welcome as we look forward to their individual contributions.



Mark Simmonds

Mark grew up in the highlands of Papua New Guinea and always planned to become a missionary.

After 9 years in the Australian Army, Mark re-trained as a Baptist Minister, serving in two churches in country Victoria and as a Reserve Army Chaplain before re-joining the Army as a fulltime Chaplain.

For his wife Jodie, it was a different journey, she met Mark while they were studying at the Australian Defence Force Academy and had never considered being a missionary, so it has been an amazing journey over the last twenty years.

Mark has served as the Deputy Program Manager in South Sudan, Lokichoggio base Project Manager and the Quality/ Safety Manager for Kenya.

In 2019 the family moved back to Australia to utilise the experiences they gained in Africa in the Arnhem Land program, where Mark currently is the Quality, Safety and Security Manager located in Nhulunbuy, Northern Territory. Working alongside department managers, across various locations to conduct root cause investigations and project management and implementation. Covering all areas of Quality, Safety and Security and the development and implementation of audit programs. One facet of their good work

One facet of the good work of the MAF appears below;

Medical Care

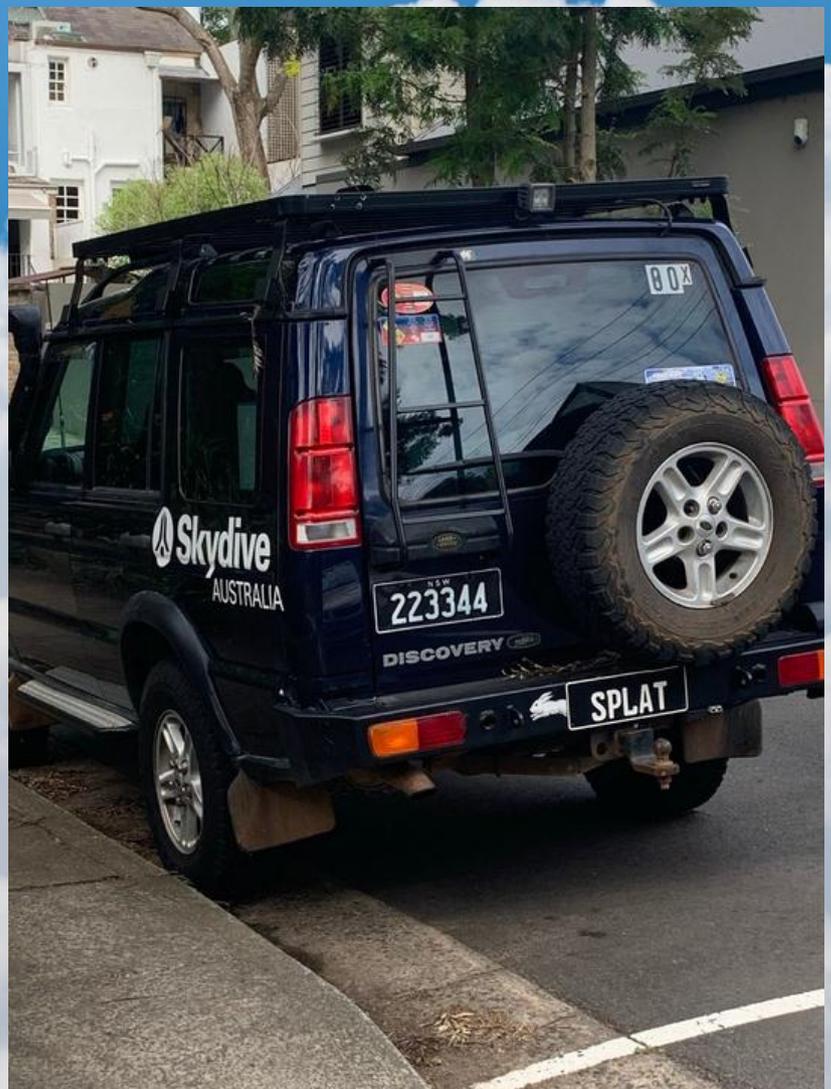
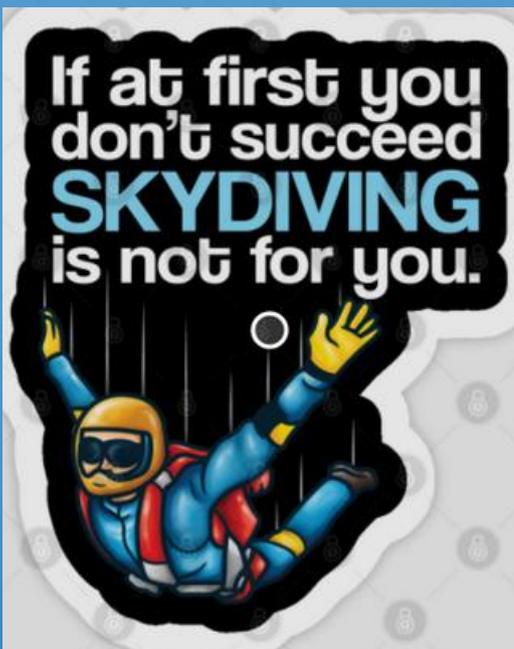
Imagine how terrible it would be to have a medical emergency but know that to get to the closest clinic would involve a days-long walk through jungles, rivers, and steep mountains. MAF airplanes are often called upon for medical evacuation (medevac) flights. The sight of an MAF plane landing on a dirt airstrip looks like hope. MAF delivers doctors, nurses, medicine, vaccines, and supplies to places where medical care would otherwise not be available.

Are you Linked In?



If you are not already a member of LinkedIn then simply search for this **ASASI** group and click on 'Request to Join'. Our group administrator (currently Neil Campbell) will approve the request (in due course!). Alternatively, simply click the LinkedIn icon to be directed to our ASASI group. The current policy is that non-members of ASASI are allowed to join the group as this will allow us to reach out to more people with an interest in air safety and to better promote the society and events such as conferences.

Especially with marketing like this!





For many of us here in Australia, summer is found out outside. We swapped our takeaway coffee cups with coffee in proper cups. We substituted social plans from picnic in the parks to anything and everything well beyond 5km radius of our homes. Summer found many of us here in Australia hopeful. Staying on theme with hope, I will be remiss not to share a story that may inspire hope especially among aviation graduates who are still finding their way into the industry.

In the Autumn 2021 newsletter, I shared **Aanchal Bharambe's** story of graduating in the wake of the pandemic and how her resilience in looking for a job within and outside of the industry did not not yield success. At present, Aanchal is now working at Qantas with a role in the Corporate Sales team for small and medium-sized enterprises. Her team manages accounts for high spending Qantas Business Rewards customers. A typical day at work for her involves making outbound calls and inbound calls by businesses that require help.

However, much like Aanchal's story back in Autumn, this role was not what she had applied for, Although she had applied and interviewed for the role of an Account Manager in the mid-market department, she did not make the cut. Far from this being the end of her Qantas dream, Aanchal left quite an impression on her interviewers who recommended her current role to gain enough experience and prepare her eventual responsibility over higher spending accounts.

Although most of what she had learnt during her undergraduate years in aviation school specialised in other departments of the airline, Aanchal recognised the merit of her aviation education which provided a good base to understand them information that is used to create the Qantas product. This helped her appreciate that the sales department is the interface upon which all the segmented knowledge in aviation comes together.

Amalina Jumary is our ASASI Student Editor. She was the recipient of the prestigious Rudolf Kapustin Award at ISASI 2019 at The Hague. Since graduating from UNSW, she is currently employed as the Deputy Audit Program Manager at Avlaw Aviation Consulting in Sydney.



For graduates who are in a different industry now and are still setting their sights on aviation, it may bring hope knowing that Aanchal believed her previous job in logistics helped her land her current role at Qantas. Experience gained and skills acquired outside of aviation contribute positively to our portfolio and grow us as people which may come in handy when we are applying for that one job we have been eyeing. Now that Aanchal has one foot in the door and with the culture at Qantas, she has the ability to move internally.

Aanchal also recommended staying informed and networking. In her role, she is exposed to all levels of stakeholders - from administrative staff to CEOs of well-known organisations. It benefits one positively regardless if one is or trying to be in the industry to stay informed on the developments in the industry, and if one is keen in joining an airline to know its products, news and network changes.

For those who are waiting on interviews in the industry, she recommends assessing strengths and weaknesses to ensure these are a good fit with the job applied. During interviews, having real life situations in the bank helps to maintain relevance and not sounding too rehearsed when answering questions.

As the year comes to a close, it may be reflective to measure how good a year has been, based on us what we have achieved. There is no one way to arrive at our goal and sometimes it takes many detours that prepare us with skills and experience that are value-adding, Maybe along the way we found something else that made us want to stay and our original goal was only a sign post to get to where we are right now. Regardless of where you are in relation to your goals - aviation or otherwise- luck is when preparation meets opportunity. Keep preparing.



V1...Rotate

Simultaneous Pestilence and Plague

Resource Management - African Style

It should have been routine; however 20th January 2020 was the start of what has turned out to be the worst locust infestation in the region in twenty-five years, destroying crops and bankrupting farming communities. The swarming grasshoppers started in Yemen where the civil war made it impossible to control the breeding and them at the source. The combination of extremely large swarms, unusually heavy rains and COVID-19 disruptions has led to a crisis across East Africa.

Ethiopian Airlines flight 363, a Boeing 737 was descending on a normal approach to runway 15 at Dire Dawa when it passed through a large swarm of locusts which completely obscured the flight crew's view of the runway. The captain later described the impact of the locusts as like rain. The flight crew attempted to use the wipers to clear the windscreen; however the wipers had no effect.

They immediately went around and climbed to 8,500 feet where the captain depressurised the 737 so that he could open the side window and reach out to attempt to clear at least part of the windscreen by hand. See the results for yourself. Makes you wonder how the engines fared!

In for a wash?



Restricted Visibility?

Local Girl Makes Good at Boeing

Queensland-born Linda Hapgood's mantra is "go take the hardest jobs, stretch yourselves, and know you can do more than you ever thought you could."

And Hapgood has stretched herself and her wings and has just been appointed lead Boeing's digital preparations for both



to

the design of its next all-new commercial jet and the integrated production system that will build it.

As Program Manager Integrated Product Team for Digital Transformation at Boeing it is Hapgood's mission to leverage all the expertise and innovation of the company's 50,000 engineers and the lessons of over 100 years of building aircraft, rockets, satellites and space stations and move it all onto a virtual world for integrated design, test, production and service.

Announcing Hapgood's appointment in a staff memo Boeing's chief engineer Greg Hyslop, Commercial Airplanes Chief Executive Stan Deal and Chief Information Officer Susan Doniz said that for "our next BCA (Boeing Commercial Aircraft) development program" the company will "create a digital environment where the next new airplane and production system can be designed together.

"This effort will determine the standards and interfaces by which we are linked together with a digital thread through design, test, certification, build and support," the memo said.

Hapgood's new virtual world will be where the next Boeing commercial aircraft will be born and it will be a massive game-changing competitive edge for the cost of designing, building, and testing an all-new design tops over \$20 billion.

For instance, says Hapgood we will digitally build the next product thousands of times before we physically build the first one as "it will be built in a virtual world."

Designing a new aircraft in a 3D computer environment is not new and Boeing used that technology in the early 90s with its 777.

However only advances in computing power in the past ten years have enabled that to be taken to a whole new level of integrated design, test, build, and production process and tools.

"What it represents is an acceleration of ambitions, desires, and readiness as a company to leverage what we've been learning in different places around Boeing," adds Hapgood.

“Our vision is to capture the advantages of technology in the sense of being able to simulate the product design, the production system design, and our services environment in the digital environment first before we build our first aircraft or lay the ground on our first factory.”

Hapgood has aviation and engineering in her genes.

Her father was an engineer with Ansett and her older sister Karen went into engineering inspiring Linda to put her “maths and science skills to good use and do something unique.”

She admits with a smile that 25 years ago she “didn’t really know much about engineering other than fixing engines.”

“So, I decided to take aerospace engineering at the Queensland University of Technology.”

While at QUT Hapgood secured an internship at Boeing Australia, which transformed into a full-time job on her graduation with honors in a Bachelor of Engineering, Aerospace, Avionics.

A three-year stint at Boeing Australia designing and implementing new weapons systems for Australia’s F-111 bombers caught the attention of Seattle and Hapgood found herself as an Avionics Project Manager responsible for 71 retrofit projects over two years.

Hapgood rapidly moved up the management ladder becoming a chief engineer on 767 and 747 Airplane Systems.

As Chief Engineer, she was responsible for more than 200 electrical and systems engineers on the 747-8, 767 Freighter, and 767-2C tanker.

“I really enjoyed the sense of bringing all the facets of a complex project together and I learned a lot about leading through influence because, as a project manager, you are not a direct manager of people, but you need to inspire people to help you achieve the goal.”

Hapgood adds that her “main passion is innovation and leading teams. As a manager, I really enjoy listening to people, understanding what they want to do and helping them bring their ideas to life.

Reflecting on her stellar career Hapgood muses that all she wanted was to get a degree in engineering and see what happened next.

“All that I knew for sure was that I wanted to have a challenging career and work overseas and see the world,” she said.

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Pakistan CAA Introduces Safety Reporting App

Voluntary Hazard/Incident Reporting System



The Pakistan Civil Aviation Authority (PCAA) has officially launched an application that will identify and report accidents and safety concerns during air travel directly to the authority. The app which is currently available for Android smartphones has been termed as the 'Voluntary Hazard/Incident Reporting System'. The application can be found on the Google Play store.

According to the PCAA, this app covers a wide range of issues from system failures to accidents and violations.

Their statement mentioned the following:

"The aim of the hazard/incident reporting app is to provide an easy, user-friendly [and] adequate platform/resources to the general public and aviation stakeholders for proactive/reactive identification and reporting of hazards/incidents and safety issues directly to the PCAA."

In a nutshell, if there are any safety concerns or chances of an incident during air travel then users can simply use the application to register their issues directly to the authorities. PCAA further added the following:

"The person reporting [the hazard or the incident] may also upload files, pictures, etc, along with [a] narrative in the support of his/her report as evidence."

"[The] PCAA firmly believes [that] aviation safety is everyone's responsibility and always gives due importance to aviation safety-related issues and remains continuously engaged to enhance aviation performance and quality."

However, a hazard reporting form can also be found on the official PCAA website.



Further information on this app can be obtained through ISASI Pakistan President, WGCDR Naseem Ahmed Syed at naseem6408@hotmail.com

Our Sponsors

We would like to thank our generous sponsors who have supported us despite the impact of COVID-19 on their organisations:





**APPLICATIONS
NOW CLOSING**

17 DECEMBER 2021

Macarthur Job Scholarship 2021

ASASI continues its partnership with the Flight Safety Foundation to encourage and assist tertiary-level students involved in the field of aviation safety and aircraft occurrence investigation. The Flight Safety Foundation remains 'Independent, International and Impartial' in championing the cause of aviation safety.

The ASASI - Flight Safety Foundation Macarthur Job Scholarship provides an annual allocation of up to AUD\$2000 to support return travel, accommodation and registration at the annual ANZSASI Seminars held in Australia or New Zealand. (Details on the student area of the ASASI website).

Due to current COVID-19 restrictions, this will be transferred to ISASI Brisbane 2022.



**APPLICATIONS
CLOSING**

17 DECEMBER 2021



Australian Government

Civil Aviation Safety Authority

Flight Safety Australia Scholarship 2021

ASASI commends CASA in awarding a scholarship to encourage and assist tertiary-level students involved in the diverse fields of aviation safety and aircraft occurrence investigation. The CASA mission is to promote a positive and collaborative safety culture through a fair, effective and efficient aviation safety regulatory system, supporting our aviation community. This award provides another means to that end.

The ASASI - Flight Safety Australia Scholarship will provide an annual allocation of up to AUD\$2000 to support return travel, accommodation and registration at the annual ANZSASI Seminars held in Australia or New Zealand. (Details and the application process will appear soon on the student area of the ASASI website).

Due to current COVID-19 restrictions, this will be transferred to ISASI Brisbane 2022.

Have you considered this as we move back to increased flying hours?



Australian Government
Civil Aviation Safety Authority

ADVISORY CIRCULAR AC 121-03 v1.0



Upset prevention and recovery training

Date	December 2020
Project number	OS 99/44
File ref	D18/116060



ISASI 2022 Conference – Brisbane

The Pullman Hotel Brisbane will be our venue for the international conference between **29 August and 1 September 2022**.

The conference will follow the standard ISASI format of Tutorial on the Monday followed by three days of technical programs.

Brisbane is a great venue and there are many options for social activities for partners. More details will be provided in the new year.

Things to do in Brisbane

- Moreton Island
- Story Bridge Climb
- Brisbane River Cruise
- Stradbroke Island
- Wheel of Brisbane
- Lone Pine Koala Sanctuary
- Tangalooma



Vale Ken Kell

*Bureau of Air Safety Investigation (BASI) – 1985 to 1999
Australian Transport Safety Bureau (ATSB) – 1999 to 2018
ICAO Flight Recorder Panel (FLIRECP)*

ASASI was saddened to learn of the sudden passing of Ken on 29th September 2021. Ken was an internationally recognised expert in the field of flight recorder replay and analysis. A particular highlight was his work with the Indonesian safety investigation agency (KNKT). Over many years he assisted the KNKT with major accident investigations and mentoring of their staff.

Ken will be remembered for his quiet and friendly manner, willingness to help others, detailed technical knowledge and tenacity in understanding the problem at hand. He will be sadly missed.

Neil Campbell recalled one particular memory related to his ingenuity in purchasing equipment.

Ken was trying to purchase some lab equipment from overseas and was getting frustrated with the lack of progress. The departmental purchasing clerk would take a long time to action the request on the pretext that some paperwork had not been completed correctly. This happened a few times and either the quote would get out of date or the exchange rate would change enough to make a new bid necessary. Eventually Ken tracked down the purchasing clerk who worked on the other side of Canberra. Ken found out the building, floor and where his desk was and turned up in person. Ken explained the purchasing rules, where all the information was and gave him all the necessary forms. The clerk was highly impressed and probably realised that Ken knew at least as much as him about what was needed!

International tributes were received from AAIB Iceland, US FAA, German BFU, TSB Canada, ICAO Montreal, BEA France, NTSC Indonesia and AIC PNG.



ATSB Drops Probe Into SIA 747F Landing Incident; Highlights Wind Shear Issue

The Australian Transport Safety Bureau (ATSB) has discontinued a probe into a 2019 serious incident in which a Singapore Airlines Boeing 747-400F damaged an engine while landing at Sydney.



“As the aircraft entered the flare it drifted right of centreline, followed by a sudden un-commanded roll to the left,” says ATSB.

“In response, the flight crew initiated a rejected landing manoeuvre, during which the number 1 engine pod struck the ground. After a second approach, the aircraft landed without further incident.”

The crew subsequently reported experiencing undershoot shear below 300ft. The crew of a 737 landing 4min later on runway 34R also reported undershoot shear. Ultimately, the damage to engine number 1 – a Pratt & Whitney PW4000 – was significant enough to see it removed from service.

ATSB investigations revealed that both the crew and the aircraft responded correctly to the situation. Wake turbulence was determined not to be a factor.

The ATSB goes on, however, to note that wind shear below 1,000ft poses a “significant hazard.”

In the past, dedicated radar systems to detect wind shear at Sydney Airport had been explored, but the cost was deemed too high and the environmental cost prohibitive.

In 2020, however, Sydney Airport observed that the cost of light detection and ranging (LIDAR) systems have fallen considerably, making implementation of a dedicated wind shear detection capability more viable.

A working group comprising Sydney Airport, the Bureau of Meteorology, Airservices Australia, airlines, and a pilot’s union has been formed to consider implementing the system.

“A trial of a low-level wind shear alerting system using a scanning doppler LIDAR system was conducted at Sydney Airport,” says ATSB.

“The trial proved the effectiveness of the system to enhance awareness of turbulence and low-level wind shear when it occurs, and the working group is now considering implementation issues. The ATSB strongly encourages the use of LIDAR systems at airports such as Sydney Airport where turbulence-related events have been known to occur.”

The aircraft (9V-SFO) was operating a service on the Singapore-Sydney route. On approach to runway 34L during the night of 28 November 2019, the crew encountered a crosswind and gusts – conditions on which they had been briefed.

 **Can't wait for the day I walk down the aisle and hear a man say "hello, this is your Captain speaking"**  



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