Aviation Safety Bulletin

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SPECIAL POINTS OF INTEREST:

- **CAAF keen for feedback**
- **ICAO data for 2017**

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Continued passenger traffic growth and robust air cargo demand in 2017 - ICAO

Montréal, 17 January 2018 – A new record 4.1 billion passengers were carried by the aviation industry on scheduled services in 2017, according to the preliminary figures released today by the International Civil Aviation Organization (ICAO). This indicates a 7.1% increase over 2016. The number of departures rose to approximately 37 million globally, and world passenger traffic, expressed in terms of total scheduled revenue passenger-kilometres (RPKs), posted an increase of 7.6% with approximately 7.7 trillion RPKs performed. This growth is a slight improvement from the 7.4% achieved in 2016.

"The sustainability of the tremendous growth in international civil air traffic is demonstrated by the continuous improvements to its safety, security, efficiency and environmental footprint. This sustainability is the result of concerted efforts and cooperation at the national, regional, and global levels, particularly in terms of ICAO compliancy, which is key to accessing the global network," remarked ICAO Council President Dr. Olumuyiwa Benard Aliu.

"Air traffic growth is making key contributions towards the achievement of United Nations Agenda 2030 Sustainable Development Goals, offering an opportunity to lift a generation out of poverty, figuratively and literally," added ICAO Secretary General Dr. Fang Liu. "As a UN agency, ICAO is deeply committed to ensuring that all countries have an opportunity to benefit from the doubling in flight and passenger volumes forecast for the next 15 years."

This is illustrated by the fact that over half of the world's 1.2 billion tourists who travelled across international borders last year were transported by air, and that air transport now carries some 35% of world trade by value. Indeed, more than 90% of cross border Business-to-Consumer (B2C) ecommerce was carried by air transport.

Air travel growth supported by improving global economic conditions

Air travel demand growth has gained solid momentum, supported by the ongoing improvement in global economic conditions throughout the year. World real gross domestic product (GDP) growth is projected to be at 2.7% in 2017, an acceleration from the 2.4% in 2016, and is expected to further strengthen to 2.9% in 2018. The upward trend was driven by the strengthening investment in advanced economies as well as the recovery in emerging market and developing economies owing to the increased export demand. The lower air fares owing to the low fuel price also continued to

stimulate traffic growth, albeit at a more moderate level compared to 2016.

Passenger traffic

International scheduled passenger traffic expressed in terms of RPKs grew by 8.0% in 2017, up from the 7.8% recorded in 2016. All regions recorded stronger growth than in the previous year, with an exception of a slowdown in the Middle East due to a combination of factors such as the competitive environment – competing hubs and more point to point services, low oil prices and the impact of a strong US dollar. The region carried 14% RPK share and experienced a significant decline in growth from the 11.8% observed in 2016 to 6.9% in 2017. Europe remained as the largest international market with 37% share of world international RPKs, and grew strongly by 8.1%, supported by the improved economic conditions in the region. Asia/Pacific had the second largest share with 29%, and grew by 9.6%, the second strongest growth among all regions. North America accounted for a 13% share, and demonstrated an improvement compared to last year, however, remained as the slowest growing region with a growth of 4.9%. Carriers in Latin America and the Caribbean managed 4% of world international RPKs and saw the biggest improvement among all regions and recorded the strongest growth at 10.0%. Africa with the smallest share of 3%, grew slightly faster than last year at 7.6%.

International scheduled passenger traffic (RPK) growth in 2017

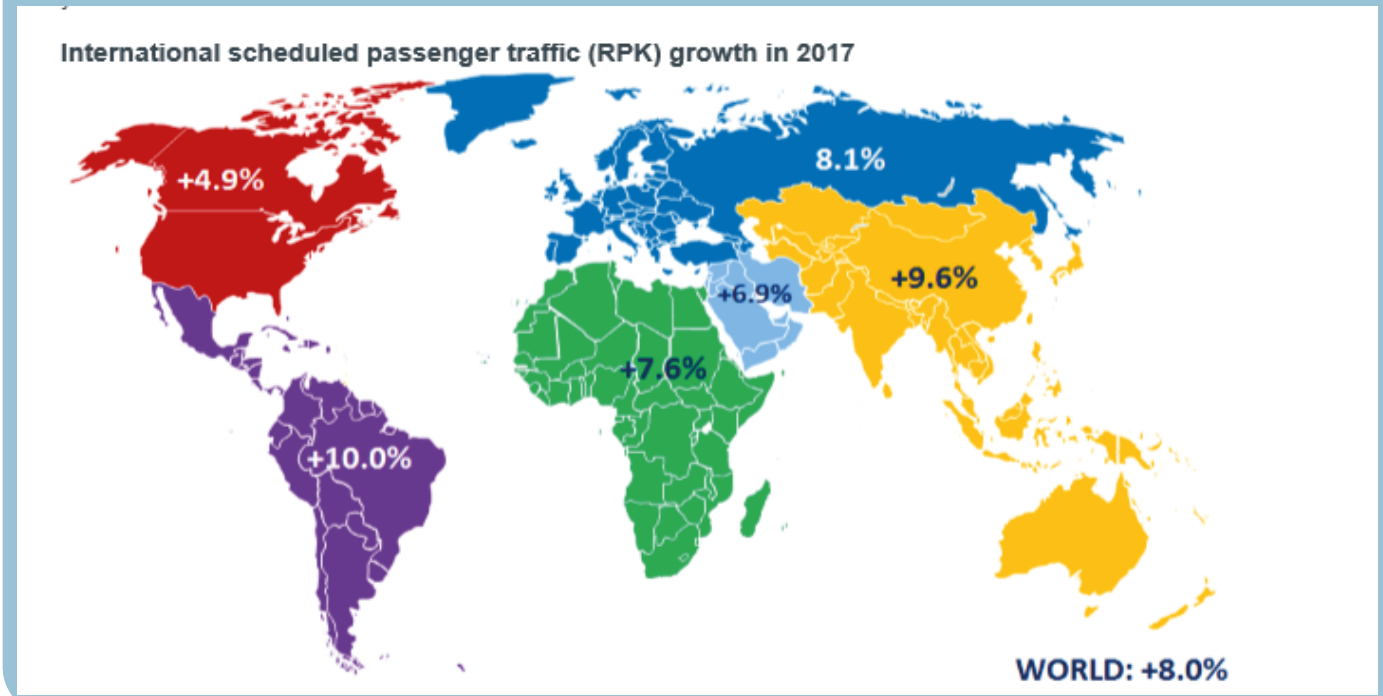
In terms of domestic scheduled air services, overall markets grew by 7.0% in 2017, an improvement from the 6.7% growth recorded in 2016. Owing to the strong demand in India and China, especially the former with over 20.0% growth, the Asia/Pacific region grew strongly by 10.6% in 2017 while North America posted a slower pace compared to last year, at 3.8% in 2017. Both regions were the world's largest domestic markets with each accounting for around 41% share of world domestic scheduled traffic.

Low-cost carrier activity

The low-cost carriers (LCCs) consistently grew at a faster pace compared to the world average growth, and its market share continued to increase, specifically in emerging economies. In 2017, the LCCs carried an estimated 1.2 billion passengers, and accounted for approximately 30% of the world total scheduled passengers. LCCs in Europe represented 33% of total passengers carried by LCCs, followed by Asia/Pacific and North America with 31% and 26%, respectively.

Load factors improved to a record high

Industry capacity expansion outstripped the increase in travel demand. Total capacity offered by the world's airlines in 2017, expressed in available seat-kilometres (ASKs), increased globally by around 6.4%. As a result, overall passenger load factor improved by 0.9 percentage points and reached a record high of 81.2%. The Middle East was the only region posting a decline in load factors, as being under pressure with the slowing trend in traffic growth. Load factor



varies by region, ranging from 70.8% for Africa to 83.4% for North America.

Surge in air cargo

Underpinned by the improving global economic conditions and world trade with increasing import and export orders, air cargo demonstrated a strong rebound in 2017. World scheduled freight traffic, measured in freight tonne-kilometres (FTK) grew robustly by 9.5% in 2017, a significant improvement from the 3.8% growth registered in 2016. The international segment of freight traffic which represents nearly 87% of total air freight grew by around 10.3% up from the 3.7% growth in 2016. The scheduled international freight load factor improved as well from around 53% in 2016 to 55% in 2017.

Airline financial results

Average jet fuel prices increased by approximately 25% in 2017 compared to 2016 but remained significantly lower than the prices observed for the ten years prior to 2016. This coupled with improvement in traffic helped the airlines to maintain their operating profit nearly at the same levels seen in 2016. The airline industry is expected to end 2017 with another record operating profit of around USD 60 billion and an operating margin of 8.0%. The net profits for the Industry are expected to be around USD 36 billion with nearly 45% of this being generated by air carriers of North America.

Improving economic conditions forecasted by the World Bank could see traffic growth and profitability momentum continuing in 2018.

View of the Global Aviation Industry

Aviation has continued to expand. It has weathered crises and demonstrated long-term resilience, becoming an indispensable means of transport. Historically, air transport has doubled in size every fifteen years and has grown faster than most other industries. In 2016, airlines worldwide carried around 3.8 billion passengers annually with 7.1 trillion revenue passenger kilometres (RPKs). Fifty-three million tonnes of freight were transported by air, reaching 205 billion freight tonne kilometres (FTKs). Every day, around 100,000 flights transport over 10 million passengers and around USD 18 billion worth of goods .

Data from ***ICAO Global Benefits of Aviation 2018***

3.8 BILLION
PASSENGERS carried by airlines (6.8% increase from 2015)

53 MILLION
TONNES OF FREIGHT carried by airlines (4.0% increase from 2015)

35 MILLION
SCHEDULED COMMERCIAL FLIGHTS flown by airlines (3.7% increase from 2015)

54,000
ROUTES WORLDWIDE (over 2,000 new routes from 2015)

49 BILLION
KILOMETRES FLOWN by airlines (5.3% increase from 2015)

76 MILLION
HOURS FLOWN by airlines (5.0% increase from 2015)

STARTLE !

A fire warning, sudden stall, an engine failure on takeoff, a cockpit alert: some pilots react quickly and appropriately, some act after a long delay, a few freeze. Exploring the best way to train pilots to cope with 'startle and surprise' is gathering momentum around the world.

The words 'Air France 447' are today synonymous with an inadequate response to an abnormal situation by a largely technologically trained crew. The crash into the Atlantic Ocean in June 2009 of the Airbus A330 was found to be largely the result of the crew's inability to understand, nor cope appropriately with, temporary inconsistencies between airspeed indications causing the autopilot to disconnect. Those inconsistencies were later thought to be the result of ice crystals blocking the aircraft's pitot tubes. It was found that the crew's actions ultimately caused the aircraft to enter an aerodynamic stall from which it did not recover. The words 'AirAsia 8501' have the same resonance. The investigation of its crash into the Java Sea in December 2014 found that while a faulty part contributed, the crew's subsequent action led to a total loss of control. The investigator's report said that when the crew was required to manually fly the Airbus A320, there was an unexplained and crucial nine-second delay before a pilot attempted to take control. By that stage the aircraft was banking at 54 degrees. The report from Indonesia's National Transport Safety Committee stated, "Subsequent flight crew action resulted in inability to control the aircraft... causing the aircraft to depart from the normal flight envelope and enter a prolonged stall condition that was beyond the capability of the flight crew to recover."

Australian researchers at the University of Southern Queensland (USQ), led by Dr Wayne Martin from USQ's Department of Aviation and Logistics, are looking at how 'startle' impairs pilots' decision making during unexpected critical events. Numerous studies so far indicate it can be as long as 30 seconds before

they're thinking clearly. Wayne Martin says that in a 2015 simulator study of the effects of startle on 18 pilots flying IFR, only five did a good job in responding. Seven were badly affected by the startle stimulus and displayed behaviours significantly delayed or dangerously unstable. "Three of those pilots continued descent so low that they became visual, with two receiving EGPWS warnings 'Pull Up, Pull Up'. "Two continued with their unstable approaches and landed, while one went around from a very low altitude." The researchers say one of the common themes emerging from the ever-increasing reliability of aircraft, is that some startled pilots either take no action, or take inappropriate action, resulting in an 'undesired aircraft state' or even an accident. If a real threat is signalled by the startle, the response can be even worse. "There's a conditioned expectation of normalcy among today's pilots," says Dr Martin. "If aircraft perform nominally day after day, year after year, and pilots are rarely exposed to actual malfunctions, then it's not hard to see how this conditioned expectation of boring sameness and normality can develop." The French civil aviation investigating body, BEA, found the crews of Flights 447 and 8501 acted in a similar manner, in that they failed to respond appropriately to startle indications. The BEA's investigating officer, Nathalie de Ziegler, said there was a need for "increased academic and operational understanding of aircraft flight regimes, improved stall recognition, being able to revert to basic and raw-data flying without delay, and importantly, to understand stalls as a 'startling incapacity'."2 Dr Martin says the problem is that the level of expectation for novel or critical events is so low that the level of surprise or startle which pilots encounter during such events, is higher than they would perhaps have had some decades ago, when things routinely went wrong. He says research into the startle response is gathering speed, globally. "There are still many unanswered questions about the best type of training to 'futureproof' pilots against the effects of startle and surprise.

"I have two studies coming up: one where at least half the pilots will receive some training prior to their sim exercise, including a comprehensive briefing on real world examples where startle and surprise have had disastrous outcomes. That briefing is accompanied by discussions on scenario based 'what would you do if…' situations. "The second will involve the pilots being exposed to a startling situation, followed by discussion and briefing, with further repetitions to get to a standard of competency. Those pilots would also be given the same briefing package as the first group, after the exercise, to take away for post-exercise reading." Wayne Martin says that the studies are trying to establish what form of training is the more effective in preparing pilots for unexpected events. "At this stage, however, there's no way to know how long that training would remain effective, given that the pilots concerned will leave the sim to work in virtually trouble-free environments."

A Change in Thinking

CAA's Principal Aviation Examiner, Bill MacGregor, says after the crash of Air France 447, there was a global rethink on training.

"When the Airbus A320 was first introduced, it was this magic electronic jet that did everything, and all you had to do was sit there. "So pilots were introduced first to the technology of the aircraft, and then they worked backwards, learning how to cope when this electronic bit was taken away, when that electronic piece was removed, when mock emergencies were introduced." But Bill says after the Flight 447 tragedy, Airbus and Boeing radically changed their thinking about recommended training. "Instead of introducing the pilot to the technology first, the pilot is introduced to the basics of flying the plane, then slowly to the technology. "That change in training is being made on the basis that when things go awry, we revert to what we learned first, even if that first learning was 20, 30, years earlier.

What Does This Mean for General Aviation?

Bill says modern GA aircraft and microlights are coming up with "some fantastic stuff", but that means student pilots are not being trained to the depth that they used to be. "Even though it's getting safer and safer to fly, the majority of aeroplanes are still the 40 to 45 year old Cessna 152, 172-type aircraft. They're still piston engine technology and they still fail, and you still have to hand fly them. "Things like advance stalling, or flying the aeroplane to the edge of its envelope. We fly in the middle of the performance envelope, instead of pushing out towards the edges, to see what the aeroplane is capable of – slow flight, high speed flight, rolling, turning, pitching. "Because we've got better technology we're not pushing it so hard. I just have this sense that we are training to the technology rather than training to the flight envelope of the aeroplane." Bill's advice to instructors? Declutter the glass cockpit. "Just learn the basic instruments – fly it on attitude, fly it on trim, fly it on power. "Then slowly introduce the capabilities of the technology. Because once all the bells and whistles are introduced, they are distractors. It's hard to tear your eyes away from the information in front of you on the screen, instead of looking outside. "I feel like startle is a bit of a

startling word. Basically it's about understanding that the technology is not always going to save you – and you need to be prepared to go back to basics."

For Instructors

One of CAA's Aviation Safety Advisers, Carlton Campbell, recipient of the CAA Flight Instructor Award in 2015, says training in startle must reflect reality. "When I was an instructor in Queenstown, I had permission from several farmers to use their property to land on. "Many training organisations don't have that luxury and they do their failures down to 500 ft and then go around. They would simulate the below-500 ft when they got back to the airfield which doesn't offer much realism in terms of an engine failure. "That last 500 feet ends up being unfamiliar in a variety of scenarios when you have limited options for simulating it. "So a student with me would typically put the power in to go around, and I'd say 'no, all the way to the ground thanks'. And you could see their mind ticking over 'I've never done this before!' They were ill-prepared for the real scenario of engine failure. That last 500 feet is the critical bit, whether you get it on the target paddock or not. "So my recommendation is that we make the training as real as possible, within the resources that we have."

Carlton's second recommendation is that startle training is done over and over and over. He says, as an example, two-thirds of his training flights would have incorporated engine failure after takeoff. "We had pilots from all over the world with varying levels of training and experience under their belt. But frequently, I could tell from their surprised reaction and delayed response to simulated abnormal situations, that continued training beyond basic competency ('overtraining') had been missing from their flight instruction.

"The simulations I'd offer showed up the inadequacies of training that wasn't real, for instance, the expectation of the pilot was that we were going to go around at 500 ft." Carlton's particular area of expertise is in mountain flying. "When we would train students in mountain flying, we'd get them to turn using all the available space, and at medium angles of bank. "But they'd come around the second 180 degrees part of the turn, and they'd find the terrain looming in their face, and they'd constantly be wanting to put on more bank, but more bank doesn't necessarily tighten the radius of the turn. "They suddenly felt as if they were going to hit the hill and they were saying 'I don't know what to do!'

"In fact, the technique is to apply back pressure to reduce the radius of the turn." There is also a very small number of pilots, says Carlton, who have an almost fatalistic response when faced with something beyond anything they have experienced before. "At Milford for example, on a hot summer's day you get significant sea breeze funnelling in and when you're on approach to land towards the sea, you get a lot of turbulence and wind shear. "I've flown with one or two pilots who've been so overwhelmed they've taken their hands off the controls. "But with overtraining for that situation, the startled reaction is eliminated." Carlton says that before instructional technique courses were beefed up, the 'ranting' instructor could provide 'startle'. "The students became stressed by the ranting, and could not respond effectively, in terms of flying skills. Very few people do, to verbal bullying. "If we're going to lay our stress on to the student they are likely to fail, because they cannot think straight. "Instructors – all of us – are guilty of doing this at times." Carlton's advice to other instructors, in summary, would be to train in all forms of startle, using the principle of the student 'overlearning' a response, and make the training compare realistically to the experiences the pilot is likely to face. "I'd be surprised if any pilot has not experienced a startle situation somewhere," he says.

It's called a 'Life' jacket for a reason

A ditching in New Zealand in 2013 illustrated how important life jacket wearing is, even if passing over water for a little while. In Fiji recently, an incident which involved the 'ditching' of the aircraft into waters off Nadi, emphasizes the need to use this safety gear. This article has been adapted from a recent Vector magazine issue.

In August 2015, when the engine of ZK-RTE broke down five nautical miles off the Canterbury coast, the pilots executed a pretty flawless return to Christchurch International Airport.

Their emergency training kicked in, and while they were fully aware of the danger they were in, the atmosphere in the Piper Arrow cockpit was calm and measured.

The only hiccup in their studied calm was having to hastily don life jackets. While stowed in the aircraft they had not been put on before the flight too off, despite the fact it was, for some time, over water.

Tension rose when the pilot-in-command Craig Vause, had trouble getting his life jacket on, because it twisted as he tried to do so. He was, however, successful on a second attempt.

Stephen Perreau, in the right seat, told *Vector* in November 2015 that not having those life jackets already on was a real mistake.

"it was a curious decision, given my practice of always doing so if I'm flying over water," Stephen told Vector. "It was definitely not the right decision to make!"

A 2003 report for Transport Canada *Survival in Cold Water (reproduced by CAAF in a previous ASB)* says that operating close to shore or in a group, or with an emergency beacon, are not reasons to go without wearing a life jacket.

Death from cold shock could occur within 3 to 5 minutes, the report said.

A quality life jacket will keep its wearer buoyant for as long as needed. American research indicates that general aviation ditching survival rates could be as high as 90 percent if the aircraft occupants are wearing life jackets.

Modern inflatable aviation life jackets are more comfortable and fit for purpose than the old, bulky ones. And the cost, relative to the cost of flying, is not high.

So there are two fewer reasons to resist wearing one.

On 24 February, a Robinson R44 helicopter ditched, fortunately, in only waist deep water, about 80 metres off the shore of Lake Rotorua. The subsequent Transport Accident Investigation Commission report said "The helicopter was fitted with life jackets for everyone on board, and these were stored underneath the seats. The life jackets were not used during the emergency as there was not enough time for the occupants to locate and don them."

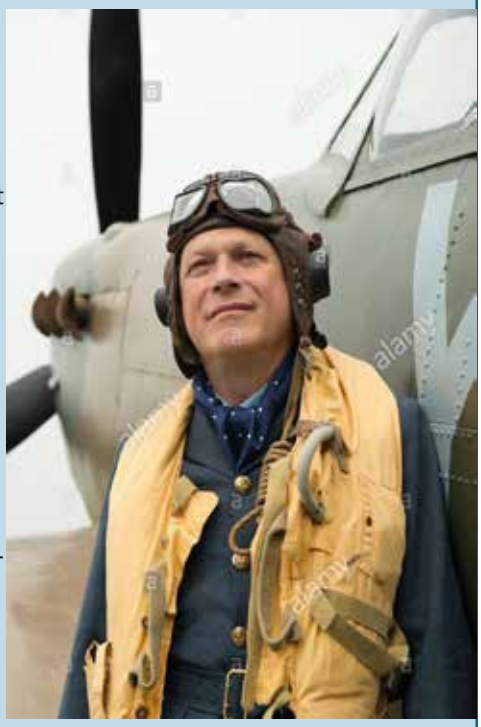
Rule 91.525 *Flights over water* states there should be one life jacket for each person on board a variety of aircraft in a variety of situations, and that those life jackets should be towed in a "position that is readily accessible from the seat or berth occupied by that person." The pilot-in-command should brief passengers on the place the life jackets are stowed, as part of the standard passenger safety briefing.

But, as Vector reported, "If the ditching preparations begin at a low altitude, the chances of the aircraft's occupants being able to get into a conventional airline-style life jacket in time are almost nil."

If the intention is to fly over water during any part of the journey, the CAA (NZ) strongly recommends a pre-flight procedure should include all occupants donning a life jacket.

It could save lives. At the very least it will save unnecessary angst. Just ask Craig and Stephen.

This recommendation applies equally to Fiji aviators where much of the flying is over water.



Runway Excursion Common Risk Factors

Runway excursion events can happen on takeoff or landing. They are typically the result of one or more of the following operational factors and circumstances.

1.0 Flight Operations

1.1 Takeoff Excursion Risk Factors

- R ejected takeoff (RTO) initiated at speed greater than V1
- Directional control during takeoff or RTO is inadequate
- RTO before V1 is reached
- No rotation because VR not reached
- Crew noncompliance with standard operating procedures (SOPs)
- Rotation not attempted
- Failure of crew resource management (CRM)
- Degraded engine performance
- Tyre failure
- Unable to rotate
- Aircraft weight calculation error
- Sudden engine power loss
- RTO — no time to abort before veer-off
- Thrust asymmetry
- Rotation above VR
- RTO not considered
- Pilot technique — crosswind
- Failure of pilot-in-command (PIC) supervision of first officer
- Improper checklist use
- Premature rotation — before VR

1.2 Landing Excursion Risk Factors

- Go-around not conducted
- Touchdown long
- Ineffective braking — runway contamination
- Landing gear malfunction
- Approach fast
- Touchdown fast
- Touchdown hard
- Flight crew CRM
- Inadequate pilot directional control
- Noncompliance with SOPs
- W heels — asymmetric-deceleration malfunction
- Approach high
- Pilot technique — glideslope/altitude control
- Landing gear damaged
- Pilot technique — speed control
- Touchdown — bounce
- Pilot technique — crosswind
- Pilot technique — flare
- Touchdown — off-centre

1.2 Air Traffic Management

- Lack of awareness of the importance of stabilized approaches
- Lack of awareness of stabilized approach criteria
- Failure to descend aircraft appropriately for the approach
- Failure to allow aircraft to fly appropriate approach speeds
- Failure to select the appropriate runway based on the wind
- Late runway changes (e.g., after final approach fix)
- Failure to provide timely or accurate wind/weather in-

formation to the crew

- Failure to provide timely or accurate runway condition information to the crew

1.3 Airport

- Runways not constructed and maintained to maximize effective friction and drainage
- Late or inaccurate runway condition reports
- Inadequate snow and ice control plan
- Not closing a runway when conditions dictate
- Incorrect or obscured runway markings
- Failure to allow use of wind-preferential runways
- Inadequate runway end safety area (RESA) or equivalent system
- Inappropriate obstacle assessments

1.4 Aircraft Manufacturers

- Lack of appropriate operational and performance information for operators that accounts for the spectrum of runway conditions they might experience.

1.5 Regulators

- Lack of a regulatory requirement to provide flight crews a consistent format of takeoff and landing data for all runway conditions
- Inadequate regulation for the provision of correct, up-to-date and timely runway condition reports .
- No international standard for measuring and reporting runway condition.

2.0 Multiple Risk Factors

The risk of a runway excursion increases when more than one risk factor is present. Multiple risk factors create a synergistic effect (i.e., two risk factors more than double the risk). Combining the effects of the risk indicators via a proper safety management system (SMS) methodology could effectively identify increased-risk operations. Applying proper mitigation strategies could reduce the risk of a runway excursion.

Article reprinted from the RUNWAY SAFETY INITIATIVE of the Flight Safety Foundation.

Too Low, No Go

What do blasting, drones, and rockets have in common? If you fly below minimum height, you might just find out.

The sky isn't the only limit when flying. Every VFR flight is bound by basic minimum height rules. A minimum height of 500 feet above the surface must be observed, with some exceptions – the most obvious ones being takeoff and landing, or emergency situations.

Picture a circle on the ground directly below the aircraft, extending out 150 metres in all directions. The aircraft must be 500 feet above any obstacle, person, vehicle, vessel, or structure within that circle.

About to fly over a 100 feet tall hill or crane? Make sure you're going to be 500 feet above it.

Extend the circle out to 600 metres in all directions and the aircraft must be 1000 feet above any congested areas like a city, town, or settlement that falls within it.

Aircraft are also required to fly at an altitude that would allow an emergency landing without hazard to persons or property. Having said all that, there are of course exceptions to the rules. Legitimate activities like aerial photography may require an aircraft to fly below the minimum. This can be done when there is no hazard to persons or property, and when there are only people essential to the operation on board.

Low Flying Zones

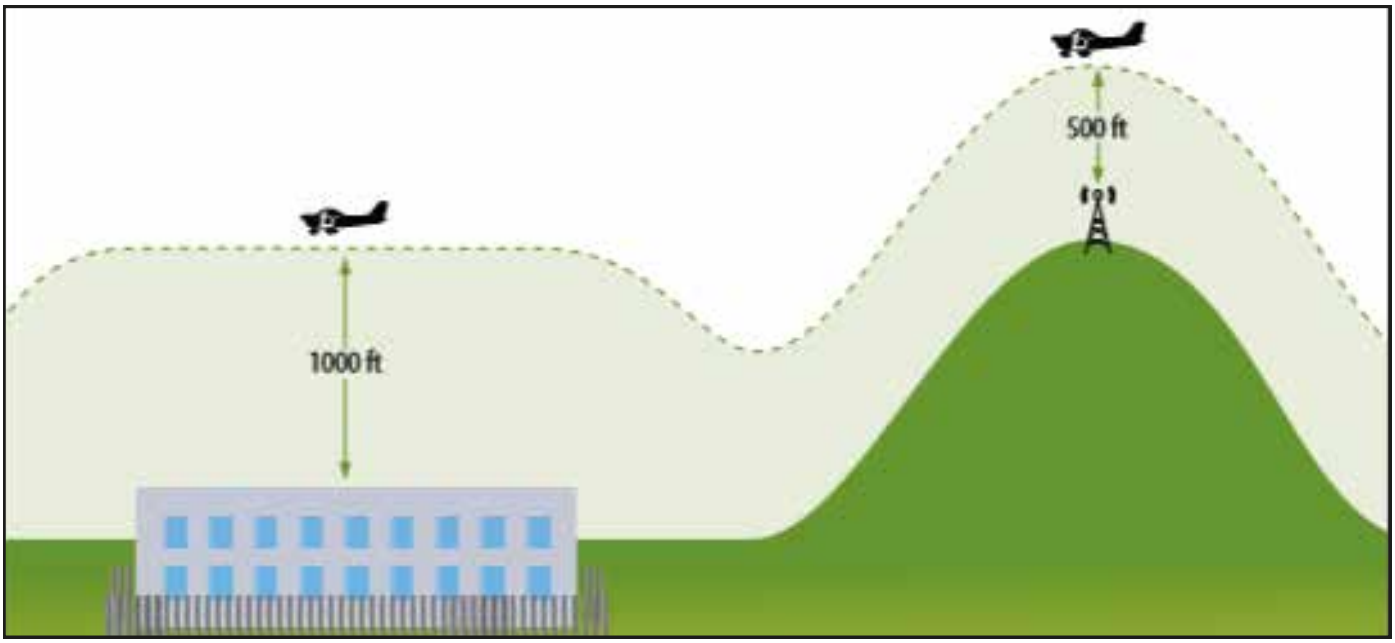
Low flying zones (LFZs) are areas designated for pilot training in manoeuvres below 500 feet.

Use of an LFZ is restricted to those who have been authorized by the holder of a flight instructor rating, and have been briefed by the 'using agency' on operating procedures for the LFZ. Aircraft should maintain at least 500 feet AGL until they cross the LFZ boundary. Likewise, when vacating, aircraft should be at least 500 feet AGL before crossing the boundary.

A lot of dangerous activity takes place below 400 feet. If it's happening more than four kilometres from an aerodrome, there's every chance that pilots won't know about it. Projectiles from debris blasting could go up to 400 feet without notification. Weapons or pyrotechnics, too, can go up to 400 feet. Balloons and kites can also go higher than you might think. The massive increase in the use of RPAS – or drones – at low level is also something that every pilot needs to be aware of and avoid.

Minimum height rules are more than just the letter of the law. They're an essential safety tool, ensuring separation from a wide and ever-increasing range of hazards.

Modified for local use from CA A NZ Vector



SMS Certification for Chief Executives

Some companies become certificated in Safety Management Systems with seemingly little trouble. What do the CEs of those companies have in common? In this article from New Zealand CAA's Vector Magazine some insights can be discovered.

A robust safety management system should flow through an entire operation in a positive way, influencing the safety-linked behaviour and values of each employee.

But it is the attitude of just one person – the chief executive – who largely drives whether the actual process of becoming SMS certificated is filled with hiccups, or is smooth and straightforward.

Those companies which have become SMS certificated on their first attempt have chief executives who share a similar approach. "They're already trying to build as strong a safety culture as possible," says Adrian Duncan, a CAA NZ safety management systems technical specialist. "They have this goal of their business operating smoothly and safely, and their bottom line untroubled by the potential expense of having to deal with an accident. "Then, before they do anything else, they've come to a thorough understanding of what SMS is all about. They've read the documents, researched creditable sources on the internet, and consulted other operators. They've attended a CAA safety management system workshop. "None of this stuff is rocket science. They've taken the time to learn the fundamentals, and they've led the organisation through the introduction of their SMS.

"In learning those basics," Adrian says, "the CEs have realised that SMS is not just Quality Assurance. Nor is it occupational health and safety at the exclusion of operational safety.

Organisations that typically fail in SMS have put all their energy into ensuring their workplace is safe, but haven't given due consideration to the management of their operational risks, which is the primary purpose of an SMS. "And a safety management system is not just documentation either. The key word here is 'system'. There are 13 elements to an SMS, and 'the manual' is just one of those. Those CEs recognised that 'producing a manual' on its own and submitting it to the CAA wouldn't make much of a difference to safety, and therefore wouldn't be enough to meet SMS certification requirements."

British safety management systems specialist, Neil Richardson, who led a Wellington workshop for CEOs in April 2017, agrees SMS is more than just paperwork. "The reality of 'doing safety' must extend beyond the manual, matrices and risk registers, and play out in the decision making and behaviour of people throughout the organisation on an hour-by-hour basis. "Safety is fundamentally behavioural."

Only when those CEs fully understood what SMS was, why it's a requirement of ICAO, and what it meant for their business, in both obligations and benefits, did they begin to put something concrete in place. "That first task," says Don McCracken, CEO of Oceania Aviation, "is to appoint a good safety officer

who understands what SMS is, what it entails, and why it's beneficial to the organisation.

"Then the leadership needs to support the safety manager's decisions as they put risk reduction systems in place, and provide them with the resources to do that." Adrian Duncan says that the CAA has no problem with chief executives getting in external consultants to assist in the design of an organisation's SMS. But, he says, some of those organisations fail in their first attempt to become SMS certificated, because the consultant has used almost a generic 'template', which proves to be a poor fit for that particular operation. "CEs who've hired a consultant and said to them 'build me an SMS, don't take up my time with it, just get it done and into the CAA' were disappointed when their application invariably failed. "The chief executives who got the most out of their consultant's fees worked closely with that person to make sure that what they came up with made sense to the CE, and would work well for their operation. This is the concept of 'scalability', where the system corresponds to the size of the organisation, the nature and complexity of the activities the organisation undertakes, and the hazards and associated risks inherent to those activities." Neil Richardson agrees that each SMS should be tailored for individual operations. "Keep it pragmatic," he says. "Make it work for you." A constant refrain from those who've become certificated is that preparing for SMS implementation is more straightforward than it first looks.

Don McCracken admits that the hardest part was "slowly coming to the realisation of how simple it could be". "Some people with practical intelligence might regard the SMS concept as obscure and difficult to put into place. But in fact, they are already practising safe behaviour to a high level every day. SMS is really just about formalising that practice."

Neil Richardson agrees about keeping it simple. "SMS can be surrounded by mystery and clouded by jargon, but once you grasp its intent of reducing and controlling safety risks, it makes perfect sense."

But what does all that mean in a practical sense? "Tool box meetings," says Don McCracken. "Daily updates on projects can identify opportunities for improvement and possible future risk. "Everyone should be involved in reviewing existing known hazards, identifying new ones, and trying to imagine the future to determine what may be up ahead. "Writing down any possible outcomes, preparing for the unknown event, creating a Plan B, and mitigating what can be mitigated." That sort of commitment by every employee is led and modelled by the chief executive, not just to achieve certification, but also because there are benefits to SMS other than those surrounding safety. "It

gives CEs a really clear understanding of the way their business works," says Adrian, "and where the holes are.

Weaknesses that maybe weren't obvious before SMS, suddenly became apparent, and can then be addressed."

"Creating and sustaining the sort of culture that makes SMS part of daily business takes leadership," says Neil Richardson. "But if fully embraced, the wider business benefits of 'being safe' can be realised through improved harm protection. "Who wouldn't want that?"

The Director of Civil Aviation, Graeme Harris, regards the introduction of SMS as a potential solution to the very poor safety performance, in international terms, of elements of commercial general aviation in New Zealand. "For many years, the prescriptive civil aviation safety regulatory system applied around the world has lagged behind the more demanding performance-based approach taken in the occupational health and safety field in many countries.

"The ICAO mandate for the introduction of SMS recognises the need for a significant improvement in safety performance. "That means a move from minimum standards in the form of civil aviation rules, to what is close to a 'best practice' standard required to manage risks to an 'all reasonably practicable steps' standard."

Graeme notes that assessing what is 'reasonably practicable' must be done in the context of international practice – not simply what is done in New Zealand. "I see safety management systems as offering the opportunity to improve GA's relatively poor safety performance. I encourage operators to engage early with the CAA during the SMS certification process and to take every opportunity to learn from their colleagues who are already certificated. "Those colleagues will be able to provide valuable advice on how best to develop the robust risk reduction strategies needed for SMS certification."

Some Tips

There's a wealth of information on the internet, and particularly on the Skybrary – Safety Management International Collaboration Group – site, which puts out plenty of readable material, good for organisations of all sizes.

Also check out the Sector Risk Profile of Parts 135 and 137 at www.caa.govt.nz, "Aviation Info > Safety Info > Safety Reports". Compare what the profile says about risk with what your organisation is already doing about that risk.

If you decide to get in a consultant, ask around first. Who did other, successfully certificated, organisations use?

The CAA web site has a range of resources to help with SMS implementation. Go to www.caa.govt.nz/sms. There's also good material at www.zeroharm.org.nz/ and at www.deloitte.com/nz/healthandsafety/.

SMS – Advice from Heli Operators

New Zealand SMS-certificated helicopter operators give their top tips for implementing SMS in any operation.

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Taranaki-based Ice Aviation, and Rotor Force in the Hawkes Bay are two 'early adopters' of a Safety Management System. Both 'Group 2' organisations, they are the first two helicopter operations to become SMS-certificated. Here, Jim Finlayson from Ice Aviation, and Tracey Campbell, the SMS Manager for Rotor Force, give their top tips for SMS certification success.

It's Not That Hard

Tracey: It really isn't that difficult, particularly if you already have a good QA system. Don't reinvent the wheel. Use what you already have, just upgrade it to match what's needed.

Jim: Don't be daunted. It's not that onerous. Break it down into little segments, review what you already have and then look at what you need to add.

Where to Start

Tracey: Do the gap analysis first. That will identify what you already have, and what you need to meet the new requirements. Focus first on your critical operational risks, the high consequence events.

Jim: Most companies with a robust QA system will already be identifying hazards and managing risk and conducting safety investigations. Assess that first. You could find that all that needs to happen is for it to be properly written down. In today's world, you need to have something concrete for the auditor to assess.

Staff

Tracey: One person cannot do this alone. Joe Faram (CEO of Rotor Force) called all his contract pilots in for a day to explain what SMS was about and how they would be involved. The system is only as good as the organisation's safety leadership and culture. Joe is really proactive in this area. His contractors respect him and if he believes in it, and walks the talk, they will too. It would be a waste of time if somebody in leadership treats it as a box tick.

Jim: I have only one staff member – me. That made composing the implementation plan more difficult. I had to tailor guidance, obviously aimed at larger organisations, to my tiny business. That was the biggest challenge for me.

Now What?

Tracey: We'll be continually reassessing and improving Rotor Force's SMS, establishing and reviewing key safety performance indicators, making changes where required, and identifying trends by looking for reoccurring types of events, common causes or risks.

Jim: You have to keep at it. SMS is not about 'the manual'. It's not about certification. It's about on the ground, day-to-day, ongoing safety measures. There's only me in my operation, but to get a fresh eye, I have a safety manager who's a very experienced helicopter pilot and who has a background in safety management. My flight examiner is the safety manager for another heli company. So both are very focused on safety and neither is hesitant to tell me when they think I need to do something differently.

"Focus first on your critical operational risks, the high consequence events."

Where to Get Help

Tracey: Joe brought me in to prepare an implementation plan because I have a background in system creation and management, as well as in workplace health and safety. If you can't do it yourself, get someone in to do it for you. Ask

other operators who they got in, what that person's background is and their experience, and what the operator thought of the implementation plan.

Jim: I was convalescing after a shoulder operation so could put the time into the implementation plan, myself. It took me about two weeks, full time. But if you can't do it yourself, and you can't afford anyone else to do it, you can ask me, or people like me, for low cost – or, depending on the circumstances, even no cost – mentoring. I already have three participant operators that I'm advising. And Aviation New Zealand has put a call out to SMS certificated operators to do something similar.

Special Tip

Tracey: If you're not sure what's required, my suggestion would be for someone from your organisation to go to a CAA workshop. I have a background in putting systems together but I still found the workshop useful. And it's free!

Jim: After I'd drafted the plan, I tested one part out, to make sure it was useful. Your emergency response plan for instance: a little desktop exercise might uncover that in reality, it wouldn't work, or wouldn't be useful. It will also show the auditors when they come to assess you at the beginning that you know for sure the system you have designed does work.

Final Words

Adrian Duncan (CAA Team Leader Airworthiness, Helicopter and Agricultural): The SMS certification of Rotor Force was relatively straightforward, because management had taken responsibility for the development of SMS from the start. They had also tailored the system to fit the size of their organisation and the specific nature of the activities it undertakes.

Joe Faram: Embrace SMS, don't resist it. View your safety management system as a tool to improve not just the safety, but the quality and control of your business. It will create efficiency, effectiveness, and profitability. With SMS you'll be constantly in tune with your business and that of your clients.

Summary

» Don't be daunted.

» Don't reinvent the wheel.

» Do the gap analysis first.

» The system is only as good as the organisation's safety leadership and culture.

» SMS is about on the ground, day-to-day, ongoing safety measures. It's not about 'the manual'.

» If you can't do it yourself, get someone (who knows what they're doing) to do it for you. Or contact CAAF for SMS guidance.

» Go to a CAA workshop, even if you think you know what to do.

» Test one part of your plan to see if, in reality, it works.

» Embrace SMS. It will improve not just the safety, but the quality and control of your business, its efficiency, effectiveness and profitability.

FEEDBACK

CAAF's quality assurance section is keen to hear from you regarding the levels of service provided. If you believe you have constructive ideas on how we can improve our service or would like to report issues of concern you may have encountered when dealing with CAAF, please send feedback to CAAF, preferably using the QA108 form that can be accessed from the CAAF website. This can be sent to CAAF by faxing it to the quality assurance officer on 6720002, dropping it in to the feedback box in the foyer of the CAAF headquarters, or emailing it to standards@caaf.org.fj.

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CAAF MISSION : We will promote effective aviation safety in Fiji and the region

8 things a CEO should do

What can CEOs say and do on a day-to-day basis to demonstrate better leadership on health and safety?

Below are eight things a CEO can do to improve their leadership of health and safety. These actions come from an evidence-based model of world-class health and safety leadership created for the Business Leaders' Health and Safety Forum. For more information see www.zeroharm.org.nz/

Clarify the vision and focus	Recognise contributions and safety achievements
Understand Health and Safety is an investment	Manage the risk
Get personally involved	Monitor the right outcomes
Engage your organisation	Let your people get on with it.