Aviation Safety Bulletin

FIRST QUARTER 2018

A PUBLICATION OF THE CIVIL AVIATION AUTHORITY OF FIJI

SPECIAL POINTS OF INTEREST:

- Training for multi emergencies
- Peak bird strike season upon us
- Flying around thunderstorms

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International Women's Day 2018

A chance to celebrate women in aviation

As the world celebrates the International Women's Day this month, the aviation industry is no exception.

British Airways operated UK's biggest ever all-female flight.

SpiceJet is conducting an exclusive recruitment drive for women pilots, while other airlines offer exclusive discounts to commemorate the day. However, in addition to celebrating women across the world, March 8, 2018, marks a very special day for women in aviation – exactly 108 years ago Raymonde de Laroche got her pilot's license, becoming the first female pilot in the world.

Raymonde de Laroche was a Parisian daughter of a plumber expected to take over the family business; her aspirations lay elsewhere.

When she was 23 she met an aviation pioneer Charles Voisin and asked him to instruct her how to fly.

With Voisin's guidance Laroche performed the first solo flight by a woman on October 22, 1909. She operated Voisin brothers' aircraft, but since the plane could only seat one person Charles Voisin instructed her how to operate the plane from the ground. After mastering taxiing around the airfield, Laroche took off and flew a few hundred meters, becoming the first woman in the world to pilot a plane.

A year after the first flight, on March 8, 1910, Laroche was issued Pilote-Aviateur license #36 from the Aéro-Club de France making her the first woman to become licensed as an airplane pilot.

Others followed suit and four other women got their licenses shortly after.

However, the aviator's achievements did not end there –

Laroche started participating in air shows and competitions. In 1910, she was the only woman participating in Aviation Week at Heliopolis where she took sixth place. Two years later Laroche won the woman's cup of the Aero Club of France and the Coupe Femina. She also set the women's flying altitude and distance record at 4,800 meters and 232 km.

Raymonde de Laroche's legacy remains to this day – her statue at Le Bourget airport in Paris immortalizes her fearless pioneering in the aviation industry.

The Civil Aviation Authority of Fiji has its own female aviation pioneers—the Controller of Ground Safety, and also the Air Navigation Services Inspector—Communication Navigation Surveillance. .

Teresa Levestam, who has held the post of Controller Ground Safety since 2015 (the first woman to hold a controller position), joined the aviation industry in 1991 as an air traffic control trainee, the first woman to do so in Fiji. She remained the only female air traffic controller for a number of years. Her passion and enthusiasm for her career choice was infectious, and now, almost 30 years later, woman air traffic controllers make up 50% of the workforce.

The other ground breaking female who recently joined the Regulator last month is Sereima Tuiketei-Bolanavatu. Ms Bolanavatu, who brought her skills to CAAF from Airports Fiji Limited, is the most licensed nav-aid technician in Fiji.

Sereima had started her foundation year of university studies unsure of what she would choose as a career and heard of the CAAF's cadet scheme through university seniors. She joined CAAF in 1992 as a telecommunication cadet and has, through the years, been licensed on every CNS facility in Fiji. The rest, as they say, is history.

CAAF appoints Flight Operations Inspector—Rotary

John Slater recently joined the regulator this month as the Flight Operations Inspector—Rotary.

He arrived in Fiji in April 2017 to work for a rotary operator based in Suva but took the opportunity to join the CAAF upon Norm Kensington's return to industry last year.

Mr Slater is ex-British Army Air Corps. On his retirement from the military he joined industry and became a UK CAA type rated instructor, instrument rating instructor and examiner before venturing to the other side of his world to take up the position in Fiji.

For those Fiji aviation organisations who need assistance with their safety management systems, Mr Slater learned his SMS through the rigorous British Army system, and moved on to be a SMS consultant in the UK, and was a CRM instructor as well.

In the words of Mr Slater Fiji is "awesome" - the weather, the people, the friendliness, the islands. "Its like another world".

Mr Slater has already experienced Fiji's outer islands and the ever-changing weather conditions that quickly prevail.

He piloted a Mercy night flight to Cicia recently and was astounded by the beauty of that island.

Recently Mr Slater was licensed as Fiji's only helicopter flying instructor which is good news for local rotary pilot aspirants.

He has a 3 year contract with CAAF and will soon be joined by his wife and family.

Human Factors in Aviation Maintenance

Area of Concern: Maintenance Related Incidents

What does it take to get an aircraft off the ground? Simple question right?

Well, if you initially said a pilot, you answered wrong. The correct answer is an aircraft mechanic. That's right. It's an easy mistake to make since we often focus on pilots and aircrew when we look at aviation operations. But let's face it, without aircraft mechanics, there wouldn't be any airworthy aircraft for pilots to fly. Think about it.

Since the end of World War II, human factors researchers have studied pilots and the tasks they perform. Yet until recently, maintenance personnel were overlooked by the human factors researchers. Whatever the reason, it's not because maintenance is insignificant. Maintenance is one of the largest costs associated with aircraft operations. Most importantly, maintenance errors can have grave implications for flight safety.

Maintenance personnel are confronted with a set of human factors unique within aviation. Maintenance technicians work in an environment that is more hazardous than most other jobs in the labour force. Their work may be carried out at heights, in confined spaces, in numbing cold or sweltering heat. Their work can also be physically demanding, yet it requires clerical skills and attention to detail. Maintenance personnel also face unique sources of stress. When maintenance personnel leave work at the end of their shift, they know that the work they performed will be relied on by crew and passengers for months or years into the future.

Maintenance errors can be the most visible result of maintenance human factors, but to understand how and why maintenance errors occur, we need to understand the organizational context in which they occur. Figure 1 below shows the main causal elements involved in accidents and incidents. It is an adaptation of the 'Swiss Cheese' model originally developed by James Reason. According to this model, accidents or incidents are usually triggered by the actions of operational personnel, such as pilots or maintenance engineers. However, these actions occur in the context of local conditions, such as communication, workplace conditions, and equipment. The task environment also includes risk controls. Risk controls are features such as procedures, checks or precautions designed to manage hazards that threaten safety. Risk controls, local conditions and individual actions can, in turn, be influenced by organizational factors such as company policies, resource allocation, and management decisions.

In order to understand and ultimately prevent accidents, it's necessary to trace the chain of contributing factors back through all the elements of the system including organizational influences. This is often referred to as root cause analysis.

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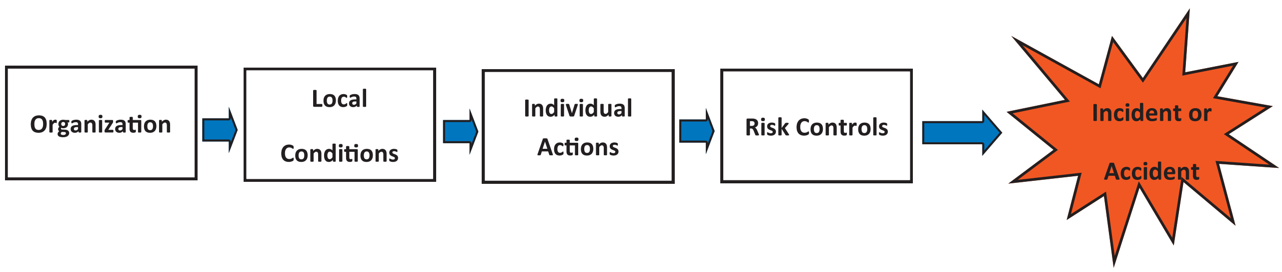
Figure 1



The "Dirty Dozen" are twelve most common maintenance-related causes of errors, which include:

1. **Lack of Communication**
2. **Complacency**
3. **Lack of Knowledge**
4. **Distraction**
5. **Lack of Teamwork**
6. **Fatigue**
7. **Lack of Resources**
8. **Pressure or sense of urgency**
9. **Lack of Assertiveness**
10. **Stress**
11. **Lack of Awareness**
12. **Social or Organizational Norms**

The individual actions that lead to maintenance incidents often reflect local conditions present in the workplace at the time of the action. Such conditions include: time pressure, fatigue, equipment deficiencies, teamwork, and group norms. Accurately identifying the nature of an error and the local conditions that prompted it is a critical step toward identifying how the system can be improved to prevent the problem from occurring again.

Originally referred to as 'defences' by James Reason, risk controls are features put in place to manage hazards in the workplace. There are two main types of risk controls related to maintenance error – preventative risk controls and recovery risk controls.

Preventative risk controls are intended to reduce the chance of unwanted events such as human error. Examples of preventative risk controls are training, task qualifications, or components designed to prevent incorrect installation.

Recovery risk controls are designed to detect and recover from a dangerous situation once it has started to develop. Functional checks and duplicate inspections are examples of procedures designed to detect maintenance errors.

Although maintenance occurrences usually involve errors made by technicians, investigations of aviation maintenance events also identify organizational-level factors such as: training and qualification systems; the allocation of resources; and the cultural or value systems that permeate the organization. Although they are unwanted events, errors are valuable opportunities to identify needed improvements and implement changes.

The organizational response to maintenance error requires two approaches.

First, the probability of maintenance error can be minimized by identifying and counteracting error-producing conditions within the organization. This typically involves attention to fatigue management, human factors training, the provision of appropriate tooling and equipment, and other actions directed at human factors associated with maintenance error.

Second, it must be acknowledged that maintenance error is a threat that can be reduced, but never entirely eliminated. One must remain ever vigilant. Organizational resilience in the face of human error can be maximized by ensuring that appropriate risk controls are in place to identify and correct errors, and minimize the consequences of those errors that remain undetected.

Training for Emergencies

Every pilot wonders if they'll have what it takes in an emergency.

All pilots wonder how they will respond to that sudden jolt, loud bang or metallic snap.
They wonder if, in the heat of that moment, training, resolve and character will be up to the challenge.
Most will never know because, most will never have such a moment.
But some reading now, will be shoved into the crucible of a life-threatening emergency. And who wouldn't want to be 'Captain Cool' in that crucible?
That's what the media called Chesley (Sully) Sullenberger after he successfully landed his Airbus A320 via an engines-out ditching into the Hudson River. Who wouldn't want to have that kind of poise and acumen?

It's an interesting question really: did Sullenberger have some secret ability or knowledge?
Perhaps we can answer that by contrasting another serious bird strike some 18 months after the New York ditching. This was Flight RAM685R, a Boeing 737 with 162 people on board.
The sun was setting on 6 June 2010 when the Spanish captain taxied to the holding point of runway 18L at Amsterdam Schiphol Airport. As he completed the preparations for take-off he was given his clearance.
'When ready, clear to line up, clear for take-off'.

After waiting for a preceding Boeing 777's wake turbulence to clear, the captain lined up and commenced take-off. As the aircraft accelerated down the runway the visibility was down to 7000 metres. No dramas. He'd taken off in far worse conditions and this was completely workable. He scanned between the runway and the instruments checking the aircraft was accelerating normally. Everything looked fine. Everything was routine. The airspeed was increasing nicely and the engine revs for the left and right engines were normal at 94.0 per cent and 93.8 per cent. It was just another take-off on another flight on another day. He'd seen plenty of take-offs like this one in his 7000 hours of flying. But in the very next couple of seconds, 'normal' and 'routine' would dramatically depart the scene.
Source: Dutch Safety Board
The first officer dutifully called 'V1' and the captain rotated the nose of the 737. As the aircraft cleared the ground the first officer reached out and retracted the gear. Then, as the landing gear retracted, they saw it—or rather saw them. More like rushing glimpses really. A sudden flurry of feathers and wings in the fading last light. Then another set, and another, and still another. At 171 knots neither the captain nor the first officer had time to process the images let alone react. All they could do was utter expletives, grit their teeth and hold on as multiple bangs and thuds erupted across their cockpit, fuselage, tail plane and wings. At the same time, the aircraft began to vibrate violently and what was once a responsive control yoke became heavy and sluggish. The first officer yelled something about the number 1 engine. The captain glanced down. It had rolled back to an N1 of 45.5 per cent—pretty much useless. He glanced at the number 2 engine indications. It was still at full thrust. But for how long? Another caution light suddenly demanded his attention. A nose gear unsafe indication.
He commanded the first officer to lower the gear again. The first officer complied with this instruction, despite its obvious drag and performance implications. Calculations done later by Boeing showed that even if the nose gear remained down, retracting the main gear would have increased climb capability from 200 to 480 feet per minute.
At the same time the first officer was on the radio requesting immediate turn for the field and letting out a 'Mayday, Mayday …'
Deep down the captain knew he was supposed to have a plan for this.

Continued overleaf

Deep down he knew he should be able to assess, decide and communicate his aircraft through the crisis. But he'd never seen or heard of this kind of thing before. **The sim sessions he'd had were always one emergency at a time and never with this kind of impact, noise or vibration.**

With the aircraft barely climbing and nothing but suburbia beneath he instinctively reefed the controls to the right putting the aircraft into a tight right turn. The runway seemed to be the only safe place to be. And that meant turning through 180 degrees and repositioning. But then, because of the snap decision to roll without climbing to a good 'clean up' altitude, the captain had to struggle to maintain altitude as the aircraft took up a flight path dangerously low and dangerously close to the 500-foot buildings of greater Amsterdam. 'Don't sink!', 'terrain!' and 'pull up' warnings sounded throughout the impromptu urban circuit.

So, what happens next? Will he (or you) be a 'Captain Cool'?

When Flight RAM685R rotated off runway 18L at Amsterdam it rotated straight into a flock of Canada geese. (What is it about Canada Geese and big jets?) Apart from their apparent proclivity for self-destruction, it's worth noting Canada Geese are not small birds. They grow to a length of 1.1 metres with a wingspan of 1.8 metres and a weight of 6 kg. At least seven of the geese struck the aircraft damaging the nose gear, the right main landing-gear, the vertical stabiliser and crippling the number 1 engine with fragmentation damage. With the warning lights, the failing engine, the vibrations and the uncertainty of what might fail next, the crew were well and truly in the crucible.

Most pilots would like to think that if they were there on that flight deck they'd be the consummate professionals: assessing the state of the aircraft, listening to the input of the flight crew, formulating a plan, communicating clearly and even, perhaps, following up with a well-placed witticism. But that's not what happened here. Although the aircraft landed without injury to any passengers, the investigation found the crew failed to climb to the required 'clean up' altitude. Instead, they made a rapid turn at 280 feet and then inexplicably reduced the thrust of the remaining engine rather than utilising the maximum available. In the words of the Dutch Safety Board, the aircraft:

"Had a limited rate of climb and could not reach the necessary safe altitude. Communication and crew resource management between the crew members during the flight was not in accordance with the internationally accepted standard for airline pilots … The crew members were then under increased pressure as the autopilot may not be engaged at altitudes below 1000 feet."

Without the assist of the autopilot, and the landing gear still down, things were all the harder to manage: numerous flight path deviations in heading, altitude, flight speed and rate of climb—all while manoeuvring between 348 and 628 feet above Amsterdam.

This is not how we'd like to imagine ourselves in the crucible. We'd like to imagine ourselves as a Sullenberger. In the Amsterdam case a public outcry ensued with questions about why a stricken Boeing 737 was allowed to fly so low over Amsterdam. Many of the public had not forgotten the 1992 aircraft disaster in Amsterdam Bijlmermeer when an El Al Boeing 747 cargo aircraft ploughed into an apartment block killing 39 people on the ground in another, far harsher, crucible event.

Why then such different performances by the two captains? No doubt, there are many significant, cumulative reasons such as experience, personality type, knowledge, etc. but two contrasting comments from each of the respective investigations hint at a more direct answer.

In the case of Flight RAM685R:

When a bird strike is trained at Royal Air Maroc, *only a single event is trained*. This means that the bird strike which is trained results in an engine failure which has to be dealt with by the crew, *there will be no additional failures. Well before these trainings the crew will be briefed on which failures they can expect* during the recurrent training. [Dutch Safety Board report.]

In the case of Sully and the Hudson River ditching, American Airlines didn't train any more regularly than Royal Air Maroc—in fact they had fewer training iterations per year—but there was a most definitive qualitative difference. John Ladd, a pilot who had flown with American Airlines for nearly two decades, in a later media article, explained how extensive the range of emergencies was prior to Sully's ditching. In the simulator, he said, they got to practice 'plain vanilla' emergencies such as engine failures, wind shear, hydraulics failures, etc. but also:

"Emergencies that allowed us to explore the flight envelope of the airplane … losing both engines on takeoff, airplane fires, structural problems and high-speed descents …"

In contrast, the pilots of Royal Air Maroc never had to deal with anything other than single event emergencies carefully pre-briefed by their instructors. American Airlines' pilots, however, received training that, in the words of Sullenberger, 'absolutely helped him during the accident event' because he was trained to 'maintain aircraft control, manage the situation, and land as soon as the situation permitted'. On the back of these comments he provided this advice to industry:

Training pilots how to respond to a dual-engine failure at a low altitude

Continued on page 8

Bird Strike Avoidance

The month of April in Fiji is historically a high risk bird strike one, attributed mainly to the departure of the Pacific Golden Plover (Dilio) which upsets other birds on the aerodrome environment.

Bird strikes can turn a routine flight into an emergency**.**

On January 15, 2009, US Airways flight 1549 suffered multiple bird strikes on departure from LaGuardia airport in New York City. The bird strikes resulted in the loss of both engines. Fortunately, the pilot was able to manoeuvre the disabled aircraft and land in the Hudson River. Everyone survived (pic below)..

Earlier this year, a "routine" flight to Tern Island in the Pacific turned into an emergency when the aircraft struck a Red-Footed Booby on landing. These birds grow to a height of approximately 2 ½ feet and weigh over 2 pounds. Fortunately, no one was injured and the aircraft received only minor damage.

You probably know that any bird, no matter the size, has the potential to cause damage to an aircraft. Fortunately, only about 15% of all bird strikes result in damage to the aircraft. The force of the impact generally depends on the weight of the bird, the difference in velocity, and the direction at impact. The force increases with velocity, which is why high speed impacts with aircraft cause considerable damage.

Although the worldwide number of reported bird strikes is increasing each year, about 80% still go unreported. More bird strikes occur during the day (63%), than at night (27%) and twilight (10%). The vast majority of bird strikes occur during takeoff / climb (35%) and approach / landing (50%).

Bird strike risk in Fiji is greatest during the bird migration seasons in April and November. More strikes occur during April migrations because large flocks of Dilio move back to Northern climes over a short period of time, whereas November migrations are slower and more irregular. In non-migratory periods, more than 90% of reported bird strikes occur below 3000 ft AGL and 61% below 100 ft AGL.

So how do you minimize or mitigate the risk associated with bird strikes? Here are a few suggestions:

Before Takeoff:

- Listen carefully to the Automatic Terminal Information Service (ATIS) and review the Notices to Airmen (NOTAMs) at your departure and destination airports for "birds in the vicinity."
- Ask airport / airfield managers to disperse any birds on or near the runway.
- For multi-crew aircraft, discuss the emergency procedures to be followed in the event of a bird strike, especially if windshield penetration results in pilot incapacitation.

In Flight:

- If possible, avoid flights along rivers or shorelines.
- Avoid low flight over bird havens such as sanctuaries and landfills.
- Remember that birds will generally break downward when threatened so attempt to pass above them.
- Hovering birds, searching for prey, have even been known to attack aircraft, so give them a wide berth.

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Bird strike article continued from page 7

 Maintain a slower speed in areas of bird activity. It will give you and the birds greater reaction time.

 Use landing lights whenever possible to make your aircraft more visible to birds.

The Regulatory requires pertaining to a bird strike is that all bird strikes and bird hazards, no matter how insignificant they might appear to be, must be reported to CAAF on Bird strike form OR002.

Notifications

Bird Watch conditions are disseminated by the following means as applicable:

- During periods of tower operations, ATC will include bird watch conditions other than LOW, on the ATIS
- When the bird watch condition is MODERATE or SEVERE, tower personnel will be notified and a NOTAM issued advising of bird watch conditions.

Air Crew Responsibilities

If an aircrew observes or encounters any bird activity while in flight which could constitute a hazard, the aircrew are to contact ATC and request that the observed bird activity be passed on to the relevant authority. The following information is necessary:

- Call sign
- Location
- Altitude
- Time of sighting
- Type of bird (if known)
- Approximate number of birds
- Behaviour of birds (soaring, flying to or from a location, etc.)

Aircrew should be aware of the codes associated with Bird Watch conditions and in particular with conditions SEVERE or ALERT. During these conditions ATC may consider changing runways, delaying take offs and landings, changing circuit altitude etc.

Training article continued from page 5.

would challenge them to use critical thinking and exercise skills in task shedding, decision-making and prop er workload management to achieve a successful outcome.

This was a lesson relating not just to the mechanics of a checklist drill but to training one's *mindset* for undrilled, unpracticed and outside-the-checklist emergencies. Sadly, this advice went relatively unheeded.

The captain of the 737 over Amsterdam had only ever completed pre-briefed, single event emergency training. Perhaps if Sullenberger's lesson had been heeded the Royal Air Maroc captain would have had that enhanced mindset—a mindset better suited to his crucible-moment over Amsterdam where 'task-shedding, decision making and proper workload management' were absolutely essential.

Of course, this means there's also a lesson for all of us. It is simply this: **once we pilots have the basics down in emergency management, and it is safe and legal to do so, we need to be challenged. We need to be pushed beyond our comfort zones and given at least a hint of what things are like in the crucible**.

For a simulator this might be compound emergencies, unannounced extra-tasking, demanding weather contexts, unannounced crew incapacitation or anything else that turns up the heat and creates a crucible-moment in training.

It's the old adage, we should be trained not merely *what* to think in an emergency but *how* to think.

It seems apt to finish with an explanation around the use of the metaphor 'crucible-moment'. A crucible is a vessel capable of handling the extreme metal-purifying heat of a furnace without melting itself. There are two significant parallels.

Firstly, in a critical but recoverable aircraft emergency a pilot must be able to handle the 'heat' of imminent danger, bewilderment and fear without melting into indecision or panic.

Secondly, the crucible is a vessel from which comes pure gold. That's what we saw with Sullenberger. Pure gold in crew resource management, technical competence and attitude. Pure gold from many a white hot moment in the simulator.

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.

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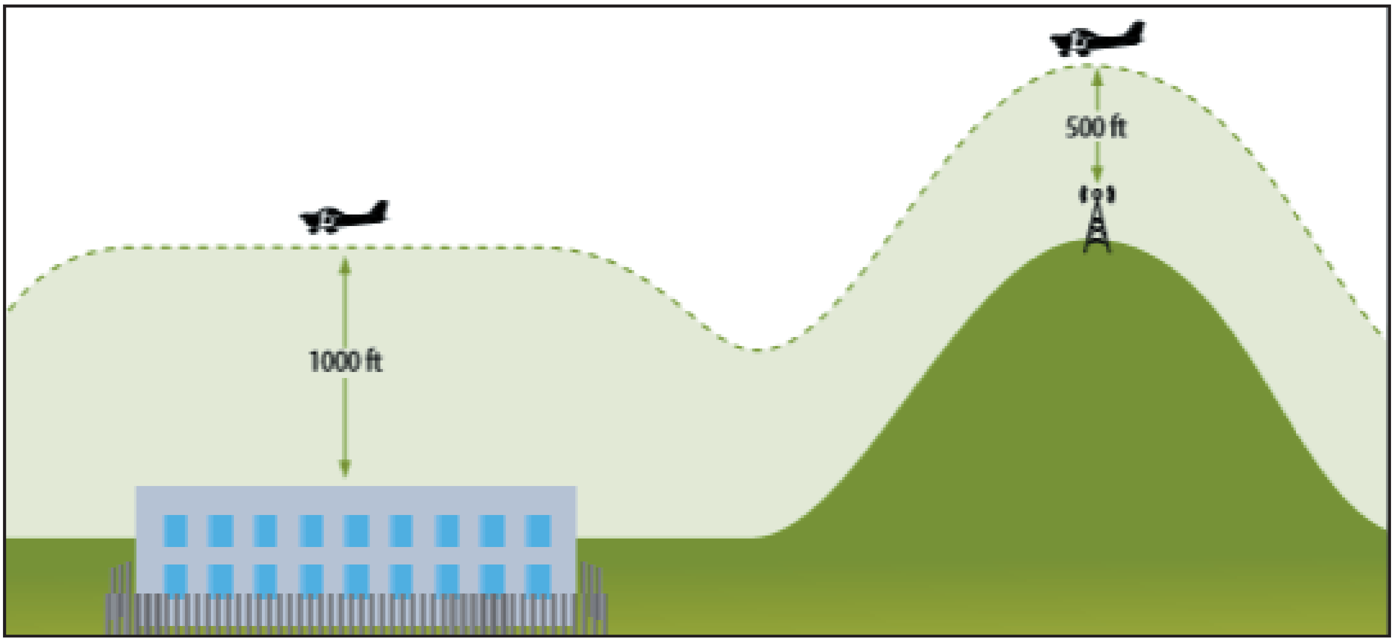

BILINGUALISM IN THE SKY

Pilot and Air Traffic Controller Communication in a Foreign Language

DR FRANCOIS GROSJEAN OF ICAO INTERVIEWS DR JUDITH BÜRKI-COHEN.

There are some 100,000 commercial flights each day in the world, which means that literally millions of interactions take place between pilots and air traffic controllers, very often in a foreign language since English is the international language of civil aviation. This entails a special form of bilingualism as it is very domain-specific and has to be optimal at all times. How does it take place? How efficient is it? Are there breakdowns and if so, what are they due to? What still needs to be improved?

Dr. Judith Bürki-Cohen, formerly a senior scientist at the U.S. Department of Transportation's Office of the Secretary, Research and Technology, has worked extensively on these questions.

What percentage of communication between pilots and air traffic controllers involves English as a foreign language for one or both parties, would you say?

In non-English speaking countries, near 100 percent, because few air traffic controllers and only some pilots are native speakers of English. In countries where English is the official language, it will depend on the percentage of international flights or international student pilots. This will vary according to region.

Who is responsible for making sure that both air traffic controllers and pilots are sufficiently proficient to talk to one another in English?

The civil aviation authorities in each country, which are affiliated with the International Civil Aviation Organization (ICAO) headquartered in Canada. For all pilots and air traffic controllers, it requires proficiency in aviation phraseology. Since March 2011, ICAO also requires general English language proficiency for pilots and controllers flying internationally or interacting with international flights.

Is English always respected or do pilots and controllers who share the same language, e.g. a German pilot speaking to a German controller, slip into their native language?

Well, they really shouldn't. One important reason is the so-called party line, i.e. a source of information for pilots and for air traffic controllers. The airspace is divided into sectors that communicate on the same radar frequency. As a pilot, I can increase my situation awareness by listening to who else is on the same frequency. This tells me who is near me and whether they encounter any weather that I should know about. I may even catch an air traffic controller's mistake, such as clearing me for the same runway as another airplane.

Pilots and controllers speaking in languages other than English deprive non-English speaking pilots flying in the same airspace of the information in the party line, and they thus diminish their situation awareness.

Flying is one of the safest ways of traveling so communication in English, even though it is in a foreign language for many, seems to work very well. What are the procedures that are in place to make it so efficient?

The most important aspect is the strictly regulated phraseology and communication procedures that aim at avoiding misunderstandings. That is why it is so critical that all pilots and air traffic controllers adhere to these procedures, which afford multiple occasions to catch errors

One procedural requirement, for instance, is careful "readback" by the pilot of what the controller has said, and "hearback" by the controller. The latter is supposed to listen to the pilot's readback and catch any readback errors.

Of course, errors can go unnoticed, especially in a congested airspace. Efforts are underway to shift routine conversations to "datalink" via satellite, where air traffic controllers can communicate with pilots via text messages.

There are some instances where communication between pilots and air controllers break down though. Can you tell us how much is due to faulty English as compared to other reasons?

In addition to readback and hearback errors, there are many reasons why communication breakdowns happen. Faulty English is just one of them and restricted to areas with international flights or pilots. Use of non-standard phraseology may or may not be due to lack of English proficiency. There are also stuck microphones which block an entire frequency and there is frequency congestion where a pilot cannot get a word in.

Another problem is airplane callsign confusions, where a pilot may take a clearance for another airplane with a similar sounding callsign. Certainly, all these issues are not helped with lack of English proficiency as a compounding factor.

How important is accent in communication breakdown since a controller and a pilot might each have a different English accent? Would you have an example of an incident due to this?

There are certainly complaints from both pilots and controllers, and incidences where accents may have played a role. A quick search of an official reporting system in the United States for "foreign accent" yields just 10 reports filed in the past 10 years. However, there are many unreported incidents involving pilots flying into non-English speaking territory, pilots using airports with foreign students, pilots communicating with non-native English speaking crew, and of course air traffic controllers communicating with international flights or pilots.

Not only may pilots and air controllers have different first languages influencing their English but they might also come from different cultures. How does this affect communication?

You may be thinking of the 1990 Avianca crash near JFK airport, where 73 of the 158 passengers died. This is a perfect example of James Reason's Swiss Cheese Model, where several "holes" in the system have to line up to result in an accident. Yes, the Avianca copilot may have been intimidated by the controller's assertive manner, and a certain "macho" culture may have prevented him from successfully communicating the seriousness of the situation. This is all conjecture, however.

The facts are that the crew did not use the correct phraseology, which would have required them to declare a fuel emergency and request an emergency landing. Also, the crew had failed to obtain weather information before and during the flight and were unaware of the serious weather around JFK airport. Thus, they did not have enough fuel to handle the resulting delays at this notoriously busy airport. Moreover, the captain missed the first approach and had to go around for a second try. Finally, a less busy controller might have further inquired after hearing the non-standard phrase "we're running out of fuel," especially with an international crew.

You give specific recommendations for how air traffic controllers should talk to foreign pilots speaking English. What are they?

Controllers should be aware that international pilots may be less familiar with the phraseology or that regional phraseologies may differ. Controllers should be especially careful with numbers and stick to giving them in single digits instead of grouping them, that is, "eight" "three" instead of "eighty three." Grouping occurs differently for different languages (three and eighty in German, or four times twenty and three in French). Units for weights, distances, barometric pressure etc. may also be different in different countries.

Controllers should speak "staccato," that is, break the instruction up into its component words by inserting short pauses. Recognizing where one word ends and the next begins is notoriously difficult for listeners of a foreign language. And, of course, controllers should pay extra attention to complete and correct readback. Finally, keeping instructions short will facilitate correct readback and save time over trying to cram too much information into one clearance.

Thunderstorms

"Avoiding thunderstorms is the best policy".

However, aircraft flying during Fiji's rainy season November to March, routinely see thunderstorms near the aerodrome.

Avoiding thunderstorms

a. Above all, remember this: never regard any thunderstorm lightly, even when radar (Met) observers report the echoes are of light intensity. Avoiding thunderstorms is the best policy. Following are some do's and don'ts of thunderstorm avoidance:

- Don't land or take off in the face of an approaching thunderstorm. A sudden gust front of low level turbulence could cause loss of control.
- Don't attempt to fly under a thunderstorm even if you can see through to the other side. Turbulence and windshear under the storm could be disastrous.
- Don't fly without airborne radar into a cloud mass containing scattered embedded thunderstorms. Scattered thunderstorms not embedded usually can be visually circumnavigated.
- Don't trust the visual appearance to be a reliable indicator of the turbulence inside a thunderstorm.
- Do avoid by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo. This is especially true under the anvil of a large cumulonimbus.
- Do circumnavigate the entire area if the area has 6/10 thunderstorm coverage.
- Do remember that vivid and frequent lightning indicates the probability of a severe thunderstorm.
- Do regard as extremely hazardous any thunderstorm with tops 35,000 feet or higher whether the top is visually sighted or determined by radar.

b. If you cannot avoid penetrating a thunderstorm, following are some do's **BEFORE** entering the storm:

- Tighten your safety belt, put on your shoulder harness if you have one, and secure all loose objects.
- Plan and hold your course to take you through the storm in a minimum time.
- To avoid the most critical icing, establish a penetration altitude below the freezing level or above the level of -15 °C.
- Verify that pitot heat is on and turn on carburetor heat or jet engine anti-ice. Icing can be rapid at any altitude and cause almost instantaneous power failure and/or loss of airspeed indication.
- Establish power settings for turbulence penetration airspeed recommended in your aircraft manual.
- Turn up cockpit lights to highest intensity to lessen temporary blindness from lightning.
- If using automatic pilot, disengage altitude hold mode and speed hold mode. The automatic altitude and speed controls will increase manoeuvres of the aircraft thus increasing structural stress.
- If using airborne radar, tilt the antenna up and down occasionally. This will permit you to detect other thunderstorm activity at altitudes other than the one being flown.

c. Following are some do's and don'ts **DURING** the thunderstorm penetration:

- Do keep your eyes on your instruments. Looking outside the cockpit can increase danger of temporary blindness from lightning.
- Don't change power settings; maintain settings for the recommended turbulence penetration airspeed.
- Do maintain constant attitude; let the aircraft "ride the waves." Manoeuvres in trying to maintain constant altitude increase stress on the aircraft.
- Don't turn back once you are in the thunderstorm. A straight course through the storm most likely will get you out of the hazards most quickly. In addition, turning manoeuvres increase stress on the aircraft.
- Looking to get around a thunderstorm ahead of you? Plan on flying around the upwind side, and don't let it get any closer to you.
- If you see a thunderstorm with numerous lighting strikes, the updrafts and downdrafts inside it are likely to be extreme. Air moving up and down at thousands of feet-per-minute cause friction, resulting in lightning strikes.

GLOBAL AVIATION BENEFITS—ICAO

MAXIMIZING THE BENEFITS OF AVIATION

This checklist provides a guide for maximizing aviation benefits in a sustainable manner.

Implementation will require leadership and concerted, co-ordinated actions from public authorities at all levels, together with aviation stakeholders, financial sectors, and international and regional organizations.

01 ECONOMIC DEVELOPMENT PLANNING

Mainstream the priorities of the aviation sector in States' economic development planning so that aviation can be used as an economic development driver.

02 AIR TRANSPORT REGULATORY FRAMEWORK

Establish and apply good governance for air transport, i.e. the institutional, regulatory, and policy frameworks, in which air transport is designed, implemented and managed.

03 AVIATION INFRASTRUCTURE

Develop quality aviation infrastructure (including air navigation systems and airports) commensurate with the level of predicted traffic growth and based on ICAO's global plans.

04 RESOURCE MOBILIZATION

Promote diversified funding and financing sources in partnership with States, international and regional organizations, and industry, as well as multi-lateral development banks and other financial institutions.

05 SAFETY AND SECURITY

Comply with ICAO's global standards and policies, as well as industry standards to continue enhancing civil aviation safety and security.

06 ENVIRONMENTAL PROTECTION

Reinforce efforts toward minimizing the environmental effects from civil aviation activities, especially the achievement of the aspirational goals of carbon neutral growth from 2020.

07 PUBLIC ENGAGEMENT

Foster an informed and engaged public as a crucial partner to advance sustainable air transport solutions.

FOOD FOR THOUGHT

SHARED VALUE: NUESTRA HUERTA

A excerpt from the ICAO Journal Number 1 of 2018

"Nuestra Huerta" (Our Garden) is a programme initiated by Mariscal Sucre International Airport, Quito, Ecuador, which aims to integrate the area's small agricultural producers in a chain of virtual community commercialization.

Currently, 16 producers and their families, residing in parishes around the airport, are participating in Our Garden.

Airport employees consume local products of Our Garden: fruits, dairy products, vegetables, bread, desserts, cooked grains, and prepared food.

The programme involves training for producers in areas such as sound agricultural and manufacturing practices, industrial safety, social responsibility, entrepreneurship and innovation, accounting management, and customer service. With the technical and financial advice of the Inter-American Development Bank, the airport has started to turn Our Garden into a shared value programme.

ICAO Aviation Security Symposium develops priority outcomes

"Aviation security remains a very dynamic context of emerging threat and risk, and we still have important challenges ahead of us," ICAO Secretary General Dr Fang Liu told several hundred international aviation stakeholders at the opening session of the inaugural AVSEC Symposium held at the Organization's headquarters. "One of these is a lack of political will to set out the changes in policy and approaches now required. Some States, for instance, still think that threats are other States' problems and will not occur locally. Others worry that the costs of security are not commensurate with the benefits. Still, others are influenced by the perceived inconvenience on travellers."

"A similar challenge which persists," Dr Liu added, "is a lack of willingness to share key information. Some actionable details regarding recent security events remain unavailable to ICAO and other Member States after they take place, and we must find a way to identify and judiciously share essential threat information in order to set out appropriate and timely mitigation measures."

The SG highlighted United Nations Security Council Resolution 2309, adopted a year ago, which spotlights terrorists' continued attraction to aviation targets and the need to strengthen implementation of ICAO security-related Standards and Recommended Practices (SARPs), including better coordination among States' related domestic departments and agencies.

She also emphasized ICAO's proposed new Global Aviation Security Plan, or GASeP, which will serve as a key mechanism through which Resolution 2309 will be implemented. Dr Liu said formal review of the GASeP is complete, and it will be presented for approval by the ICAO Council in November.

KEY OUTCOMES

A framework to cultivate a new mind-set that embraces aviation security as a culture of international cooperation and collaboration beyond a set of standards.

"The GASeP comprises five priority outcomes," she explained:

1. Enhanced risk awareness and response
2. Co-development of effective security cultures and the human capabilities needed to support them
3. Improved technological resources and greater innovation
4. Improved oversight and quality assurance
5. Increased cooperation and support

VOLUME 5, ISSUE 1, 2018

FEEDBACK

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CAAF VISION: We will be a model regulator

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

Moving towards predictive SMS

Aviation safety management has changed greatly over the past years. It began with the safety officer being responsible for the whole program. It was negatively orientated and relied on inspections and mishaps to let the organizations know where their problems existed. This was a very reactive and expensive system.

As time progressed, risk identification, assessment, and management concepts were incorporated into safety programs.

In the past few years, a systems approach has been adopted. Safety joined Quality Assurance and became a team that was tasked with looking at systems errors. This required that organizational management take responsibility for the company's safety program. The systems approach requires that the safety/quality team be educated in their duties and responsibilities. Emphasis is placed on management skills. The SMS team should be able to manage safety systems that include risk management, audits, data collection, analysis, and incident investigations, and the interoperability with Quality Assurance.

A risk assessment can be done any time the organisations feels it warranted but must be done prior to:

1) **operational change**—such as adding a new aircraft to the fleet or a new route;
2) **organizational change** — new CEO, staff, or function;
3) and after an **unexplained increase in safety events**.