Issue 1 January 2016

ISO 9001:2008 Certified

AVIATION SAFETY BULLETIN

A Publication of:

Civil Aviation Authority of Fiji
PRIVATE MAIL BAG, NAP 0354,
NADI AIRPORT,
REPUBLIC OF FIJI
Phone: (679) 672 1555, Fax: (679) 672 1500

Inside this Issue:

SMOKE TOXICITY

The spectre of fire in the air is a pilot's recurrent nightmare...

Fire is an integral part of our everyday life, and smoke is one of its products. There have always been efforts to control fire and use it for constructive purposes, but even then, accidental fires do occur and fire continues to cause loss of lives and property.

Uncontrolled fires threaten homes, factories, and transportation systems. The specter of fire in the air is a pilot's recurrent night-mare, carried over from the early days of fabric covered aircraft, when the time between ignition and loss of the aircraft could be measured in relatively few minutes.

Modern aircraft benefit from flame retardant materials and improved fire extinguishing systems to such an extent that in-flight fires are rare occurrences.

However, survivable crashes followed by fire happen, primarily from fuel spills around the downed aircraft. In the confined environment of an aircraft cabin, the presence of smoke automatically indicates the existence of an emergency situation.

Extinguishment of fires obviously has first priority, but smoke inhalation should be recognized as a very real danger while this is being accomplished. Inhalation of toxic gases in smoke is the primary cause of fatalities in most fires—this is true whether the fire is in an aircraft cabin, a residential bedroom, or a high-rise building. Smoke gases do not need to reach lethal levels to seriously impair pilot performance. Sublethal exposures can cause even experienced pilots to make potentially fatal mistakes.

In view of the seriousness of any aircraft fire, let us examine the various aspects of fire and smoke.

FIRE

Each fire is different...

Fire is a complex, dynamic, physico-chemical event and is the result of a rapid chemical reaction generating smoke, heat, flame, and light. Each fire is different. Smoke composition and heat generated in a fire de- pend on types of burning materials and environmental conditions.

SMOKE

Its gases could be toxic...

Smoke is a complex of particulate matter, as well as a variety of invisible combustion gases and vapors suspended in the fire atmosphere. Smoke may diminish light and obscure vision, and its gases could be toxic.

SMOKE GASES

Carbon dioxide levels increase and oxygen concentrations decrease...

Carbon monoxide and hydrogen cyanide are the two principal toxic combustion gases. Most cabin furnishings contain carbon and will generate both carbon monoxide and carbon dioxide when burned; carbon monoxide can also be released from faulty cabin heaters. Burning wool, silk, and many nitrogen-containing synthetics will produce the more toxic hydrogen cyanide gas. Irritant gases, such as hydrogen chloride and acrolein, are generated from burning wiring insulation and some other cabin materials. Generally, carbon dioxide levels increase and oxygen concentrations decrease during fires.

SMOKE EFFECTS

At high altitude, the effects are greatly enhanced...

Visual smoke can delay escape from a fire, while the irritant gases can induce tears, pain, and disorientation. The visual obscuration is obvious, but the subtle effects of carbon monoxide and hydrogen cyanide inhalation, although less readily detected, can cause physical incapacitation and subsequent death. Toxicologically, carbon monoxide com- bines with the hemoglobin in blood and interferes with the oxygen supply to tissues, while hydrogen cyanide inhibits oxygen utilization at the cellular level. Carbon dioxide, a relatively innocuous fire gas, increases the respiration rate causing an increase in the uptake of the other combustion gases.

(Continued to Next Page)

SMOKE TOXICITY cont...

(Continued from previous page)

The decreased oxygen level found in most fire scenarios further enhances the problem of getting enough oxygen to the biological sites to maintain normal function. Continued inhalation of these gases can result in severe hypoxia. At high altitude where oxygen levels are lower, the effects of carbon monoxide and hydrogen cyanide are greatly enhanced.

SIGNS AND SYMPTOMS

Not all symptoms will necessarily be experienced ...

Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death. Although carbon monoxide causes deleterious effects on the central nervous system, death usually occurs from cardiotoxicity.

Not all symptoms will necessarily be experienced by every individual exposed to this gas. Some have succumbed from inhaling low carbon monoxide levels, while others have survived breathing higher concentrations. Hydrogen cyanide poisoning signs and symptoms are weakness, dizziness, headache, nausea, vomiting, coma, convulsions, and death. Death results from respiratory arrest. Hydro- gen cyanide gas acts very rapidly—symptoms and death can both occur quickly.

SURVIVAL

Knowledge of the less obvious hazards and a few simple preparations can increase one's chances...

There is no universal best procedure to follow in the event of an aircraft fire because no two fires are likely to be the same. Extinguishing the fire, if possible, is the immediate priority. An equally obvious second priority is to breathe as little smoke for as short duration as possible.

Some larger aircraft are supplied with portable, self-contained breathing masks for the crew, but small private aircraft usually are not. Any cloth held over the nose and mouth will provide protection from smoke particulates; if the cloth is wet, it will also absorb most of the water-soluble gases (i.e., hydrogen cyanide and hydrogen chloride).

Cabin venting will reduce the concentrations of combustion gases, but is not usually a viable option while actually fighting the fire. Knowledge of the less obvious hazards and a few simple preparations can increase one's chances for survival in an aircraft fire. A small, hand-held fire extinguisher can be used to put out small on-board fires. Careful inspection and maintenance of cabin heaters will minimize the chance of carbon monoxide leakage into the cabin air system. A carbon monoxide detector could also be installed in the cock- pit to detect the presence of this colorless, odorless gas. As always, planning your probable actions before an emergency arises will increase your chances for acting quickly and correctly.

Remember...

- Fires are the main hazard for the occupants of a survivable crash.
- A fire generates smoke, heat, flame, and light • Inhalation of toxic gases in smoke is the primary cause of death in most fires.
- Carbon monoxide and hydrogen cyanide are the main toxic gases in smoke.
- Exposure to carbon monoxide can also be the result of faulty heaters.
- A wet cloth held over the nose and mouth provides some protection from smoke inhalation.
- A small, hand-held fire extinguisher should always be carried aboard general aviation aircraft.
- Install a carbon monoxide detector in the cockpit. ■

Source: Article uplifted from Medical Facts for Pilots-FAA.

FIT AND PROPER PERSONS (FPP)

Under the Air Navigation Regulations 1981 (ANR) and CAAF Standard Documents (SDs), before a person or organisation may be issued with an aviation document, the Authority must satisfy itself, that the applicant and any person who is to have, or is likely to have, control over the exercise of the privileges under the document, is a Fit and Proper Person to have such control or hold the document. Examples of such persons are:

Accountable Manager: The person who is nominated to hold the authority and has responsibility within the applicant's organisation for ensuring that all activities authorised under an approval Certificate and undertaken by the organisation can be financed, properly resourced and carried out in accordance with the requirements and standards prescribed under the ANR and SDs.

Senior Persons: Persons holding key management positions within the organisation who support the Accountable Manager in maintaining effective control of the scope, activities and privileges of the aviation document issued to the organization by CAAF.

Personnel Licenses: Any applicant for a license or a current license holder.

What it means to be 'fit'

Fitness is about ensuring that the applicant:

- is physically and mentally fit to perform the privilege being sought;
- is competent and able;
- has the appropriate qualification, training, experience, and skills needed to perform the responsibilities, functions and duties of the aviation document they want to hold.

What it means to be 'proper'

Proper is about a person's character and personal attributes. It involves an assessment of a person's behaviour to consider things such as their:

- attitude;
- integrity, credibility and honesty;
- judgment;
- tendency or willingness to disregard the law.

Assessments

In summary, the Authority forms a committee to assess applicants for Fit and Proper status. This is not simply a matter of assessing competence to do a particular activity but requires consideration of the applicant's conduct and attitude measured against the responsibilities, functions and duties of the holder of an aviation document required under ANR.

In assessing attitude, it is important to identify any hazardous attitudes or character attributes. These may present as:

- a careless or uncaring attitude towards the law and/or compliance;
- a willingness to disregard the law;
- an anti-authority approach;
- impulsiveness;
- resignation or a lack of confidence.

Past behaviour is used as an indicator of future behaviour. Reoffending conduct or patterns of behaviour are particularly relevant to any assessment, because it can aid in assessing whether an applicant has learned from past mistakes, and can provide an insight into the applicant's likely future conduct. Behaviour also provides insight into a person's attitude and character

A crash on the 24th March 2015 of an Airbus A320-200 in the French Alps, 100km Northwest of Nice has highlighted the need for more exhaustive efforts in assessing Fit and Proper Person status of aviation document holders. Reports suggest that the copilot of the Germanwings Flight 9525 deliberately flew the plane into the mountains killing all 144 passengers and 6 crew members. The co-pilot was a competent flyer but his mental fitness is now questionable following reports of past treatments for suicidal tendencies. Reports which he kept from his employer. ■

By the Ground Safety Department; Sources – CAA NZ, CAAF Fit and Proper Procedure

SPACE BASED ADS-B
ICAO HAS WELCOMED THE ITU'S FREQUENCY ALLOCATION DECISION

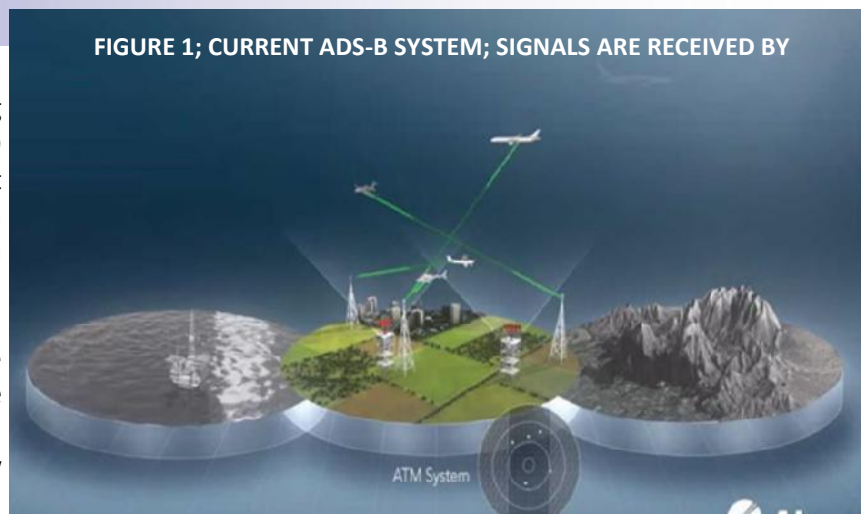

FIGURE 1; CURRENT ADS-B SYSTEM; SIGNALS ARE RECEIVED BY

The Secretary General of the International Civil Aviation Organization (ICAO), Dr. Fang Liu, welcomed the positive outcome on ICAO frequency allocation position for global flight tracking at the International Telecommunication Union's (ITU's) 15th World Radio communication Conference in Geneva (WRC-15).

The ITU's positive decision clears the hurdle related to an earth-to-space aeronautical mobile satellite (route) service (AMS(R)S) allocation and opens the way for new capabilities and a new approach to the tracking of global flights.

"Safety is aviation's number one priority," stressed Dr. Liu, "and ICAO is therefore very much encouraged by the positive support our global tracking position has received at WRC-15. The allocation of frequencies enabling satellite-based ADS-B provides a very important piece in the global flight tracking solution which ICAO and the aviation community have been working toward, and will now help it to become a practical and cost-effective reality over remote and high seas airspace."

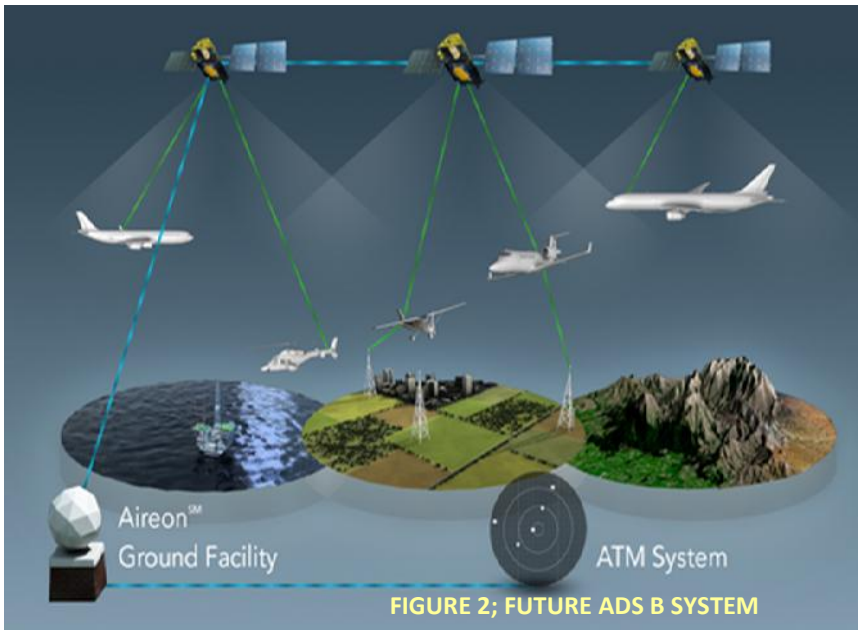

FIGURE 2; FUTURE ADS B SYSTEM

ADS-B, or automatic dependent surveillance – broadcast, is an ICAO-standardized technology whereby aircraft can broadcast position reports on the 1090 MHz frequency. ADS-B, in principle, provides all the information required for global flight tracking. A significant limitation, however, was that its broadcasts could only be received by ground stations within line of sight of an aircraft. With a new satellite constellation currently being deployed capable of capturing ADS-B reports from aircraft located in polar, oceanic and other remote areas, and then re-broadcasting them to ground systems, the global air transport community saw an opportunity to leverage and complement existing ADS-B aircraft capabilities for global tracking without requiring aircraft retrofits.

Position reports can be received by ground stations if in range and satellites if out of range. Reports are then sent through other satellites to a ground station which could be located anywhere in the world. The position reports then travel by Virtual Private Network (VPN) to the controlling country and displayed on surveillance screen for Air Traffic Management.

The system would be especially beneficial where full surveillance coverage of a State's area of jurisdiction is not possible due to its size and/or unavailability. ■

Source: Article by GSD - ICAO (13/11/15)

FLY SAFE: PREVENT LOSS OF CONTROL ACCIDENTS

What is Loss of Control (LOC)?

A Loss of Control (LOC) accident involves an unintended departure of an aircraft from controlled flight. LOC can happen because the aircraft enters a flight regime that is outside its normal flight envelope and may quickly develop into a stall or spin. It can introduce an element of surprise for the pilot. Contributing factors may include: poor judgment/ aeronautical decision making, failure to recognize an aerodynamic stall or spin and execute corrective action, intentional regulatory non-compliance, low pilot time in aircraft make and model, lack of piloting ability, failure to maintain airspeed, failure to follow procedure, pilot inexperience and proficiency, or the use of over-the-counter drugs that impact pilot performance.

Did you know?

- Approximately 450 people are killed each year in General Aviation (GA) accidents.
- Loss of Control is the number one cause of these accidents.
- Loss of Control happens in all phases of flight. It can happen anywhere and at any time.
- There is one fatal accident involving LOC every four days.

The Aviation industry can work together to prevent Loss of Control (LOC) accidents and save lives and you can help make a difference.

Transition Training

What is transition training?

Pilots benefit from transition training. Pilots need training when they transition from low-to-high and high-to-low performance aircraft.

Why is transition training important?

The National Transportation Safety Board's (NTSB) accident data suggest that pilots with low time in type of aircraft are more likely to crash. Although some transition training such as high performance, high altitude, complex aircraft and tail wheel instruction and endorsement is required by regulation, training focused on unique types and variations of aircraft can also be essential.

Did you know?

Pilots trained in traditional aircraft are more than twice as likely to have an accident in Light Sport Aircraft (LSAs) than pilots who are first trained in LSAs. The first 50 hours a pilot flies in experimental/amateur built aircraft are the most hazardous. Transition training with an experienced and qualified instructor can make this period safer.

What does good transition training look like?

Transition training should:

- be conducted in accordance with a written training syllabus, which serves as a checklist for training;
- be based on a review of practical test standards, which list the flight proficiency standards for the certificate and/or rating the transitioning pilot holds;
- teach the pilot about what is different about an airplane and its installed equipment, such as avionics or controls;
- cover normal, abnormal, and emergency procedures;
- cover performance characteristics, including what to expect on takeoff, landing, cruise, descent, and glide;
- address limitations, such as weight and balance, speeds, and wind limits;
- be done with a current, qualified instructor who is fully knowledgeable about the airplane and equipment a pilot wants to train in; and
- be conducted in the environment that reflects where the pilot intends to fly.

Tips for pilots:

- Document personal performance.
- Avoid distractions.
- Seek refresher training within six months of original transition training. Follow with annual training. Refresh training when returning to flying after a period of inactivity.
- Join an aircraft type club.
- Join the WINGS proficiency program.
- Practice! ■

(Source: FAA Safety Briefing, March/April 2014)

PILOT DEHYDRATION

There is scant attention given to it. Most pilots overlook it. Some shrug it off. While others simply don't know about its effects in the cockpit.

THE PROBLEM

Most pilots are unaware of its devastating effects and symptoms, which can increase the risk of aircraft incidents and accidents, even during a mildly warm day. So in order to heighten general aviation's awareness of this often-overlooked condition, pilot dehydration is added to the list of physiological conditions found such as the symptoms, causes, effects and corrective actions. It is believed that educating pilots about dehydration will not only decrease aircraft incidents, but will also save your life one day.

Most pilots associate dehydration with thirst and assume that an easy fix is just to drink any type of liquid. This is not always the case. A pilot's dehydration condition can be caused by a lack of water within the body cavity due to high body temperatures, a dry aircraft environment, excess caffeine, antihistamines, inappropriate fluid intake and other factors. Many soft drinks, teas and juice drinks do not constitute good hydration substitutes, as they contain caffeine and sugar that may compromise absorption of the water content.

Hot cockpits and flight lines also cause dehydration. The current weather in Fiji can lead to an obvious cause of dehydration. But what about the 72-degree cockpit? Pilots should concern themselves in that environment, too, since average humidity in the cockpit is low, causing a dramatic increase in fluid loss.

Everyone must be aware that un-replaced water losses equal two percent of body weight and will impact your body's ability to regulate heat. At three percent loss, there is a decrease in muscle cell contraction times. When fluid losses equal four percent of body weight, there is a five to 10 percent drop in overall performance, which can last up to four hours.

The three stages of heat exhaustion that lead to dehydration are:

1. Heat stress (99.5° to 100° F body temperature) reduces:
   - Performance, dexterity and coordination;
   - Ability to make quick decisions;
   - Alertness;
   - Visual capabilities;
   - Caution and caring.

2. Heat exhaustion (101° to 105° F body temperature) symptoms:
   - Fatigue
   - Nausea/vomiting
   - Giddiness
   - Cramps
   - Rapid breathing
   - Fainting

3. Heat stroke (above-105° F body temperature) symptoms:
   - Body's heat control mechanism stops working
   - Mental confusion
   - Disorientation
   - Bizarre behaviour
   - Coma

THE SYMPTOMS

The symptoms of dehydration go beyond thirst. In an effort to respond to the brain's need for fluid, the kidneys reabsorb water through the urine, creating fluid retention and frequent urges to visit the bathroom. Dry skin is also an indicator of dehydration, as the skin gets most of its moisture sub dermally. The brain is 75 percent water and, when it needs to replace lost fluid, it can manifest certain symptoms, such as headaches, light-headedness and fatigue. Dehydration also contributes to fuzzy thinking, poor decision-making, dizziness and muscle fatigue. Long-term effects includes wrinkled skin, impaired memory function, dry hair, brittle nails, constipation, susceptibility to colds, and because of extremely dry nasal passages, sinus infections.

(Continued to Next Page)

PILOT DEHYDRATION cont...

(Continued from previous page)

So how do you avoid dehydration in the cockpit?

You'll need to :

- permanently attach yourself to a water bottle and drink from it regularly.
- One should drink cool, 40-degree Fahrenheit water before feeling thirsty. This will help you stay ahead of the game, keeping you hydrated before the "thirst mechanism" sets in.

But for some, plain bottled water might be offensive. So one alternative to water is to simply drink mineralized (electrolyte) water. Electrolyte drinks, more commonly known as sports drinks, are generally designed to replace the fluids (water) and electrolytes (sodium, potassium, chromium, manganese, etc.) lost during stress, body temperature regulation and exercise. Most contain sugars which may lower a pilots systemic blood-sugar levels and precipitate fatigue.

It is also recommended to stay away from coffee, sodas and Teas —otherwise called diuretic drinks. These beverages contain caffeine, alcohol and carbonation, which causes excess urine production or decreased voluntary fluid intake—a sure sign of dehydration. In addition, don't over-exercise before a flight, since it can cause a large amount of body fluid loss that is difficult to replace quickly. You also need to keep in mind that acclimation to a major change in weather takes one to two weeks, which can drastically affect your flying abilities. Monitoring personal effects of aging, recent illness, fever, diarrhoea or vomiting can also help you in gauging whether or not you're dehydrated.

But, perhaps, the most important factor in preventing dehydration is to continually be aware of your physiological and environmental conditions. This will help to maintain your rehydration water intake and prevent you from progressing into heat exhaustion and even heat stroke. It's a good plan for a problem that can easily be avoided—all with just a few gulps of water. ■

(Source: pilot.com)

CONGRATULATIONS FIJI AIRWAYS ON THE ARRIVAL OF A330-300

FLY IT SAFE

Advisory on the Safe and Responsible Operation of Unmanned Aircraft
(For recreational and private uses only)

DOs

DON'Ts

ADVISORY ON THE SAFE AND RESPONSIBLE OPERATION OF UNMANNED AIRCRAFT

(For Recreational And private Use Only)

Given Fiji's small airspace and populated urban environment, the flying of unmanned aircraft must be carried out in a safe and responsible manner. If not carried our properly, the operation of unmanned aircraft may pose a risk to aviation and public safety. Despite the safety features in some unmanned aircraft, mechanical malfunction, loss of control link or human error could occur and cause operators to lose control of their aircraft in flight. This may result in the unmanned aircraft colliding with a manned aircraft or another unmanned aircraft, or hitting persons and property on the ground, potentially causing injury and damage.

Operators should ensure that they are able to operate unmanned aircraft safely, exercising due care and concern for others. For recreational and private use, this advisory provides guidelines in the form of "Do's and Don'ts" on flying an unmanned aircraft safely.



An unmanned aircraft, also known as an unmanned aerial vehicle (UAV) or drone, is an aircraft that is operated with no pilot on board.

For More Information

Please refer to www.caaf.org.fj to find out more about the safe use and operation of unmanned aircraft for recreational and private use. Queries related to any other uses (e.g) commercial use) of unmanned aircraft should be referred to the:

Civil Aviation Authority of Fiji, Air Safety Department

Attention: Flight Operations Inspector – Floatplane & General Aviation. *Contact Mobile* (679) 999-5207 or *email:* treasure.marshall@caaf.org.fj.

ISO 9001/2008 CERTIFIED

Private Mail Bag
NAP 0354
Ottawa Road,
AFL Compound
Namaka, **Nadi Airport**

Phone: (679) 672 1555
Fax: (679) 672 01500

HEALTH TIPS—WHAT TO DO IF SOMEONE SUFFERS AN IN-FLIGHT HEART ATTACK

Heart attack - is actually not a medical term — **"myocardial infarction"** is the proper name. Most heart attacks are caused by a blood clot that blocks one of the coronary arteries. The coronary arteries bring blood and oxygen to the heart. If the blood flow is blocked, the heart is starved of oxygen and heart cells die. This differs from sudden cardiac arrest, which occurs when the heart develops an arrhythmia that causes it to stop beating.

It's important to note that **women and men can present very different symptoms of a heart attack**. As with men, women's most common heart attack symptom is chest pain or discomfort. But women are more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting, and back or jaw pain.

*Some **common symptoms of a heart attack**:*

- pain, fullness, and/or squeezing sensation of the chest;
- nausea, vomiting, and/or general discomfort in the upper-middle abdomen;
- upper back pain;
- arm pain (more commonly the left arm, but may be either arm);
- jaw pain, toothache or headache;
- shortness of breath;
- Sweating;
- heartburn and/or indigestion;
- general malaise (vague feeling of illness);
- no symptoms — (approximately 1/4 of all heart attacks are silent, without chest pain or new symptoms silent heart attacks are especially common among patients with diabetes mellitus).

Action For Heart Problems On A Plane

To note there are differences in treating someone having a heart attack versus someone in sudden cardiac arrest.

The three things a person needs when they're having a heart attack are **an aspirin, oxygen and nitroglycerin - this** three medication should be always found in a plane's emergency medical kit. It's important that the aspirin is chewable, or at least that the person chew it so that it gets into their system as quickly as possible. Except not to be given to the person if they have a life-threatening allergy.

Administering these three things to someone exhibiting symptoms of a heart attack can prevent it from escalating to sudden cardiac arrest. And if the person is instead simply having severe heartburn or a panic attack, this course of treatment won't do any additional harm.

The difference between a heart attack and cardiac arrest in terms of visible symptoms is that **with cardiac arrest, the person will lose consciousness** because their heart has stopped beating.

If this happens, the single most important thing to do is to **act as quickly as humanly possible**.

This means that while flight staff should be called, **it's a person's fellow passengers who could save his life, by doing the following:**

1. ***Confirm that the person is in fact unconscious.*** There is no need to feel for a pulse, as it can take too long for a lay person to find.
2. ***Lay them down in the aisle.***
   Start chest compressions**.** They should be fast and deep, and, most importantly, consistent, with no pause whatsoever.

Rest assured that while a medical emergency like an **in-flight heart attack** may occur, it **doesn't have to result in a tragedy**. Keep yourself informed, stay aware of your body (and pay attention to the symptoms of your loved ones) and know that your flight crew is trained and ready for a worst-case scenario.

In other words, take heart — and travel safe. ■

CAAF's Standards section is keen to hear from you regarding our levels of service. If you believe you have constructive ideas on how we can improve our services, or would like to report instances where we have failed to meet your expectations, please send your feedback to CAAF, preferably using the QA 108 form that can be accessed from our website. This can be sent to CAAF by faxing it to Quality Assurance Manager on 6727429, dropping it in the feedback box in the foyer of CAAF HQ, or emailing to standards@caaf.org.fj.

Your suggestions for improvements to this publication are also invited. CAAF also invites you to submit valuable information or articles that you would like to have published through this bulletin for the benefit of readers. Your name will be appropriately acknowledged. Please use

FCAIR

FIJI CONFIDENTIAL AVIATION INCIDENT REPORTING FORMS AVAILABLE ON WEBSITE www.caaf.org.fj OR FRONT DESK, CAAF HQ

FLYING ONBOARD A SEAPLANE