COMPANY INFORMATION AND SAFETY BULLETIN

Edition No.: 10 **Date: 01 May 2014**

Safety Bulletins

A **microburst** is a very localized column of sinking air caused by a small and intense downdraft within a thunderstorm. There are two types of microbursts: wet microbursts and dry microbursts. They go through three stages in their life cycle: the downburst, outburst, and cushion stages. The scale and suddenness of a microburst makes it a great danger to aircraft due to the low-level wind shear caused by its gust front, with several fatal crashes having been attributed to the phenomenon over the past several decades. A system for predicting the occurrence of microburst/windshear comprising at least one sensor for receiving lightning produced signals, a processor for processing those received signals to produce data and generate a warning when the processed data indicates that a microburst/windshear is about to occur has been introduced in some countries to notify and prevent pilots from flying into this weather phenomenon.

Pan Am Flight 759, operated by a Boeing 727-235, N4737 *Clipper Defiance*, was a regularly scheduled passenger flight from Miami to San Diego, with en route stops in New Orleans and Las Vegas. On July 9, 1982, the plane that made this route was forced down by a microburst and crashed into the New Orleans suburb of Kenner. All 145 people on board, as well as 8 more on the ground, were killed. The crash had the highest number of aviation fatalities in 1982, and as of 2013 remains the fifth-deadliest air disaster to occur in United States territory.

Delta Air Lines Flight 191 was a regularly scheduled service from Fort Lauderdale-Hollywood International Airport, Florida to Los Angeles International Airport, California, by way of Dallas-Fort Worth International Airport. On the afternoon of August 2, 1985, the plane crashed when it hit a microburst while landing at DFW, killing 8 of the 11 crew members and 126 of the 152 passengers on board, and one person on the ground. Two people later died 30 days or more after the crash, bringing the total fatalities to 137.

Source: http://en.wikipedia.org/wiki/Delta_Air_Lines_Flight_191

Source: http://www.skybrary.aero/index.php/Microburst

Turbulence Explained

Turbulence is caused by the relative movement of disturbed air through which an aircraft is flying. Its origin may be thermal or mechanical and it may occur either within or clear of cloud. The absolute severity of turbulence depends directly upon the rate at which the speed or the direction of airflow (or both) is changing, although perception of the severity of turbulence which has been encountered will be affected by the mass of the aircraft involved.

Significant mechanical turbulence will often result from the passage of strong winds over irregular terrain or obstacles. Less severe low level turbulence can also be the result of convection occasioned by surface heating.

Turbulence may also arise from air movements associated with convective activity, especially in or near a thunderstorm or due to the presence of strong temperature gradients near to a Jet Stream. Jet Stream Turbulence, like turbulence caused by Mountain Waves, which can form downwind of ridges, occurs clear of cloud and in the form of Clear Air Turbulence (CAT).

Very localised, but sometimes severe, Wake Vortex Turbulence may be encountered when following or crossing behind another aircraft. This turbulence is due to wing tip trailing vortices generated by the preceding aircraft; however, this phenomena is distinctively transient.

Air moving over or around high ground may create turbulence in the lee of the terrain feature. This may produce violent and, for smaller aircraft, potentially uncontrollable effects resulting in pitch and / or roll to extreme positions.

Relative air movements which involve rapid rates of change in wind velocity are described as wind shear and, when severe, they may be sufficient to displace an aircraft abruptly from its intended flight path such that substantial control input is required to compensate. The consequences of such encounters can be particularly dangerous at low altitude where any loss of control may occur sufficiently close to terrain to make recovery difficult. The extreme down-bursts which occur below the base of cumulonimbus clouds called Microbursts (as mentioned above) are a classic example of circumstances conducive to Low Level Wind Shear.

For the purpose of reporting and forecasting of air turbulence, it is graded on a relative scale, according to its perceived or potential effect on a 'typical' aircraft, as Light, Moderate, Severe and Extreme.

- Light turbulence is the least severe, with slight, erratic changes in attitude and/or altitude.

- Moderate turbulence is similar to light turbulence, but of greater intensity - variations in speed as well as altitude and attitude may occur but the aircraft remains in control all the time.

- Severe turbulence is characterised by large, abrupt changes in attitude and altitude with large variations in airspeed. There may be brief periods where effective control of the aircraft is impossible. Loose objects may move around the cabin and damage to aircraft structures may occur.

- Extreme turbulence is capable of causing structural damage and resulting directly in prolonged, possibly terminal, loss of control of the aircraft.

In-flight turbulence assessment is essentially subjective. Routine encounters involve light or moderate turbulence, although to inexperienced passengers (or pilots), especially in small aircraft, these conditions may seem to be severe.

The perception of turbulence severity experienced by an aircraft depends not only on the strength of the air disturbance but also on the size of the aircraft - moderate turbulence in a large aircraft may appear severe in a small aircraft. Therefore pilot reports of turbulence should mention the aircraft type to aid assessment of the relevance to other pilots in, or approaching, the same area.

Wake Turbulence

Wake turbulence:

is turbulence that forms behind an aircraft as it passes through the air. This turbulence includes various components, the most important of which are wingtip vortices and jetwash. Jetwash refers simply to the rapidly moving gases expelled from a jet engine; it is extremely turbulent, but of short duration. Wingtip vortices, on the other hand, are much more stable and can remain in the air for up to three minutes after the passage of an aircraft.

The creation of wingtip vortices:

Lift is generated by the creation of a pressure differential over the wing surfaces. The lowest pressure occurs over the upper wing surface and the highest pressure under the wing. This pressure differential triggers the rollup of the airflow aft of the wing resulting in swirling air masses trailing downstream of the wing. After the rollup is complete, the wake consists of two counter-rotating cylindrical vortices. Most of the energy is within a few feet of the centre of each vortex, but pilots should avoid a region within about 100 feet of the vortex core.

The ICAO wake turbulence category (WTC) is entered in the appropriate single character wake turbulence category indicator in Item 9 of the ICAO model flight plan form and is based on the maximum certificated take-off mass, as follows:

- **H** (Heavy) aircraft types of 136 000 kg (300 000 lb) or more;
- **M** (Medium) aircraft types less than 136 000 kg (300 000 lb) and more than 7 000 kg (15 500 lb) like the Beechcraft 1900 aircraft; and
- **L** (Light) aircraft types of 7 000 kg (15 500 lb) or less.

Warning signs

Any uncommanded aircraft movements (such as wing rocking) may be caused by wake. This is why maintaining situational awareness is critical. Ordinary turbulence is not unusual, particularly in the approach phase. A pilot who suspects wake turbulence is affecting his or her aircraft should get away from the wake, execute a missed approach or go-around and be prepared for a stronger wake encounter. The onset of wake can be insidious and even surprisingly gentle. There have been serious accidents where pilots have attempted to salvage a landing after encountering moderate wake only to encounter severe wake turbulence that they were unable to overcome. Pilots should not depend on any aerodynamic warning, but if the onset of wake is occurring, immediate evasive action is vital.

Source: http://en.wikipedia.org/wiki/Wake_turbulence

SAS SAFETY REPORTING FOR THE MONTH

Indeed we remind all the crew and maintenance personnel that Sahel Aviation Service has set a Key Performance Indicator (KPI) of 2 reports per aircraft per week of operation and 1 report every two weeks from maintenance. Hence, as per the set KPI of Sahel Aviation Service, we should have received (38 reports). However, for the month of April we have only received 22 reports. The best reporter was from the Bamako-Mali operation with a total of 14 reports. We urge everyone to report even if it is a repetitive occurrence and to contribute to the Sahel Aviation Service Safety Management System (SMS).

Interesting Facts: A Boeing 747 can carry around 60,000 gallons (about 227,0000 liters) of jet fuel. At about 6.7 lbs per gallon (about 0.8 kg per liter), the fuel in a full 747 weighs about 400,000 lbs (about 181,000 kg).

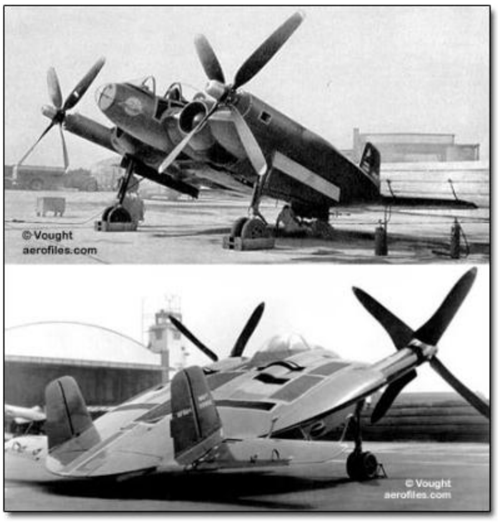
American Airlines saved $40,000 a year by taking out ONE olive from each salad they served.

When it comes to cutting costs, taking out a single olive might not seem like the most effective way to go. But for American Airlines in 2001, it worked out quite well. Following 9/11, airlines were having some difficulty. There were numerous other factors involved, but the terrorist attack on the World Trade Center and Pentagon had left people a little uneasy about airplane travel, in the same way that movie ticket sales have been down following the recent shooting in Colorado.

To show an example, American Airlines' then rival, United Airlines, was doing so poorly that they would have needed to fill 103% of their seats just to break even. So Bob Crandall, the former chief of AA, made many cost cutting decisions- including removing one olive from each salad.While one olive might not seem like much cost saving, all the olives taken out made up a $40,000 drop in in-flight meal costs per year.

Read more at http://www.omg-facts.com/lists/541/15-Shocking-Facts-About-The-Airplanes-You-Fly-In/3#5bvhmQzbqAzZLXCT.99

Guess the Aircraft:



What, you thought planes needed *wings* to fly? You owe this aircraft an apology, buddy. During World War II, the U.S. Navy was fighting in the Pacific and needed planes that could save on fuel but also fly extremely fast, regardless of how ridiculous they looked. That led to this aircraft -- a disc-shaped plane that looked like a UFO (and in fact got reported as such during test flights), nicknamed "the flying flapjack."

Read more: http://www.cracked.com/article_19330_8-wtf-aircraft-designs-that-actually-caught-air.html#ixzz30Gur6VCK

April issue aircraft: Avro Canada VZ-9 *Avrocar*

Aviator of The Month

Oswald Boelcke

Oswald Boelcke (German:19 May 1891 – 28 October 1916) was a German flying ace of the First World War and one of the most influential patrol leaders and tacticians of the early years of air combat. Boelcke is considered the father of the German fighter air force, as well as the "Father of Air Fighting Tactics"; he was the first to formalize rules of air fighting, which he presented as the *Dicta Boelcke*. While he promulgated rules for the individual pilot, his main concern was the use of formation fighting rather than single effort.

"When everything seem to be going against you, remember that the airplane takes off against the wind, not it ." -- Henry Ford