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VISIONAIR INTERNATIONAL

safety newsletter

Winter 2016

10 years how time flies...

Chief Executive Safety Message

Colleagues,

When safety and operational requirements are properly balanced and integrated, the aviation department is positioned to provide the best overall service. A Safety Management System (SMS) creates and maintains this integration and balance. Safety communication comes in several forms. Heard on an almost daily basis is the question, "Can we do it safely?" This may be asked verbally by a supervisor or another crew member. If the risk is marginal, what mitigation steps can we take to make the risk as low as reasonably practicable?

The safety reporting promotes communication within the department. It encourages discussion and information exchange .

Every employee should feel completely safe in expressing concern on safety matters without fear of retribution from supervisors. Errors in judgment, errors of commission and errors of omission should be openly admitted with the understanding that everyone can learn from the mistakes of others. The department that adheres to a "just culture" encourages open communication and takes advantage of teaching moment.

Editorial

Dear Colleagues,

While watching the movie 'Sully' a film portraying the Sullenberger's January 2009 landing on the Hudson river following the planes strike with a flock of geese; I began to recount the bird strike that we had earlier this year.

Being a novice in the field of aviation, my knee jerk reaction to anything significant being discussed at the office is to google it and soak in as much information as I can. During my research, I was astounded about how common bird strike incidents are and how significant a threat it is to flight safety. So when I was approached about my thoughts on Bird Strike being the topic of this quarterly newsletter I was really pleased.

I hope that this topic of aviation safety is as captivating to you as it is to me. After reading this newsletter you will surely take some new bits of information. As Aviators we must always remember that safety is paramount and staying informed is key.

Sukaina Faizi

Bird Strike

A bird strike is strictly defined as a collision between a bird and an aircraft which is in flight or on a take off or landing roll. The term is often expanded to cover other wildlife strikes - with bats or ground animals.

Bird-strike events are relatively common, occur most often on the ground or at low altitude, and are usually benign. However, bird strikes can have significant economic and occasional safety consequences for flight operations. Pilots and operators should be knowledgeable about the hazard, and flight crews should use facts, data, and standard operating procedures to reduce the potential for and consequences of a bird strike.

Bird strikes are a lesser hazard to aviation than other well-known hazards such as loss of control in flight, controlled flight into terrain, and runway excursions, but they can and do present risk that needs to be addressed.

The first bird strike was recorded by the Wright brothers in 1905, and the aviation wildlife hazard has been a risk to aviation ever since.

The January 15, 2009, ditching of US Airways flight 1549 on the Hudson River in Weehawken, New Jersey, was the dramatic result of dual engine thrust loss arising from an airborne encounter with a flock of Canada geese. Although Boeing airplanes meet and exceed the government regulations for bird strikes, accidents and serious incidents can occur.

Operators and flight crews should be aware of the risk of bird strikes, prevention strategies, and actions to take following a bird strike. This article discusses the characteristics of bird strikes, presents practical information for flight crews, highlights the importance of reporting bird strikes, and provides resources for additional bird-strike information.

CHARACTERISTICS OF BIRD STRIKES

While bird strikes usually inflict most damage on the engines, all areas of an airplane can be damaged. Airplane damage and effect on flight from bird strikes are closely correlated to kinetic energy, derived from the mass (determined by bird species) and the square of the speed of the collision. (A 20 percent increase in speed raises the kinetic energy by 44 percent.)

Most bird strikes occur on or near the ground, highlighting the need for wildlife management on airport grounds and in the vicinity. The aviation bird-strike hazard is a global and industry-wide issue affecting all aviation stakeholders, including pilots, mechanics, airlines, airport operators, air traffic controllers, wildlife personnel, aviation safety analysts, airplane and engine manufacturers, flight training

organizations, and the traveling public. Boeing participates in national and international groups dedicated to exploring and addressing the problem of bird strikes, and Boeing airplanes meet and exceed regulatory bird-strike requirements. Boeing has many design features, including system separation, system redundancy, and structural attributes, to protect against bird strikes beyond the four-pound regulatory general bird-strike FAA requirement (eight pounds for empennage).

Bird Strike

COMMON MISCONCEPTIONS ABOUT BIRD STRIKES

A number of widespread misconceptions about bird strikes may give pilots a false sense of security and prevent them from reacting appropriately to the threat of a bird strike or an actual event. These misconceptions include:

- Birds don't fly at night.
- Birds don't fly in poor visibility, such as in clouds, fog, rain, or snow.
- Birds can detect airplane landing lights and weather radar and avoid the airplane.
- Airplane colors and jet engine spinner markings help to repel birds.
- Birds seek to avoid airplanes because of aerodynamic and engine noise.
- Birds dive to avoid an approaching airplane. In fact, one of these statements is scientifically proven.

In fact, none of these statements is scientifically proven.

Single or multiple large birds, relatively small numbers of medium-size birds, and large flocks of relatively small birds are all problematic and have resulted in accidents. In the United States, a list of birds most hazardous to flight has been identified: large flocking waterfowl (Canada goose); gulls; pigeons and doves; blackbirds, starlings, and sparrows; and raptors (hawks and kestrels).

PREVENTIVE STRATEGIES

Airports are responsible for bird control and should provide adequate wildlife control measures. If large birds or flocks of birds are reported or observed near the runway, the flight crew should consider:

- Delaying the takeoff or landing when fuel permits. Advise the tower and wait for airport action before continuing.
- Take off or land on another runway that is free of bird activity, if available. To prevent or reduce the consequences of a bird strike, the flight crew should:
- Discuss bird strikes during takeoff and approach briefings when operating at airports with known or suspected bird activity.
- Be extremely vigilant if birds are reported on final approach. If birds are expected on final approach, plan additional landing distance to account for the possibility of no thrust reverser use if a bird strike occurs.

THE IMPORTANCE OF REPORTING BIRD STRIKES

Flight crews and maintenance and line personnel are encouraged to report all bird strikes because data are essential to quantify and manage the hazard. Reporting bird strikes enables aviation authorities to monitor the risk to aviation and the effectiveness of wildlife hazard mitigation measures. Bird-strike data, together with knowledge of the operational environment, are utilized by Boeing as a basis of many airplane design features beyond regulatory requirements. Bird-strike data also help researchers understand the nature of strikes and develop a scientific approach to reduce the cost and safety consequences of bird strikes.

Aviation stakeholders should report all known or suspected bird strikes to their national or recognized

Bird Strike

wildlife strike data repository (e.g., the FAA National Wildlife Strike Database in the United States) and share the strike information with the airport operator, the airline safety department, and the aircraft and engine manufacturers. Each of these individual reports will be combined into a single composite data record. Reporters should provide as much information as possible, including:

- Airplane model and series designation (e.g., 777-300).
- Airplane serial number or registration.
- Phase of flight.
- Speed and altitude of the airplane.
- Airplane model and series designation (e.g., 777-300).
- Airplane serial number or registration.
- Phase of flight.
- Speed and altitude of the airplane.
- Geographical location of the airplane.
- Date and time of day.
- Origin and destination airport.
- Number and species of bird observed and struck.
- Impact locations of strikes and damage on airplane.
- Effect on flight (e.g., rejected takeoff, air turnback, diversion).

If bird remains are available, trained personnel should identify the species involved, or the bird remains should be collected using the correct procedure and bird-strike collection kit and shipped to a qualified laboratory. It is crucial to determine the species of the bird or birds involved in a bird strike and the location of the strike, so that wildlife management can take appropriate actions. Effective wildlife management involves controlling attractants, often species-specific, including food, foraging, roosting, and nesting opportunities. Managing the environment may be necessary, even to the extent of grass type and height, insects, rodents, and invertebrates, along with water sources and land use, such as agriculture.

In the event of a bird strike, maintenance personnel should follow the appropriate maintenance procedures for bird strike inspection in the Airplane Maintenance Manual. Maintenance personnel must be cognizant of the possibility that the bird remains can contain infectious material. The bird strike should be reported by the flight crew in the pilot's log or by the maintenance crew in the maintenance log. After a bird strike, the airplane should be inspected for possible damage to airplane structure and airplane systems.

PREVENTION STRATEGIES

Pilots should not rely on onboard weather radar, landing lights, airplane markings, time of day, or visibility to prevent bird strikes.

- Flight operations may need to be modified in the presence of known or anticipated bird activity.
- Delay takeoff or landing in the presence of bird activity.
- Below 10,000 feet, keep speed below 250 knots if operationally possible.
- Below 2,000 feet, climb at the maximum rate t reduce the flight time exposure to a strike hazard.
- Descend with idle power and avoid extended low-altitude level flight, particularly over water courses, nature reserves, or other areas of known or expected bird activity.
- When landing is assured, consider landing through birds versus a missed approach to avoid birds. This reduces the energy of the collision, the potential for increased damage associated with engines at a high power level, and the potential for multiple engine ingestions at low airplane energy states and low altitude.
- Avoid or minimize maneuvering at low altitude to avoid birds.

BIRD STRIKES DURING TAKEOFF ROLL

If a bird strike occurs during takeoff, the decision to

Bird Strike

• Consider air turnback or diversion to nearest suitable airport, because damage may affect aerodynamic lift and drag, subsequent fuel burn, and ability to complete the flight safely.

Known or suspected airframe damage or engine damage

• Maintain or reduce speed — do not accelerate unless necessary for safety of flight or to maintain flight path control.

Damaged windshield or depressurization

• Below 10,000 feet, discontinue climb and level off.

• Above 10,000 feet, descend to 10,000 feet or the minimum safe altitude.

Known or suspected strike with landing gear extended or in takeoff or landing configuration with high lift deployed

• Use available system information to assess possible damage to flight controls and high lift devices, and make minimal and prudent changes in airplane configuration in accordance with the flight phase.

• Use available system information to assess possible damage to landing gear and associated systems, including exposed electrical, pneumatic, and hydraulic systems, and potential effects on the ability to steer and stop on the runway.

Known or suspected strikes to air data and angle-of-attack sensors

• Be aware that this may affect other airplane systems and have cascading effects.

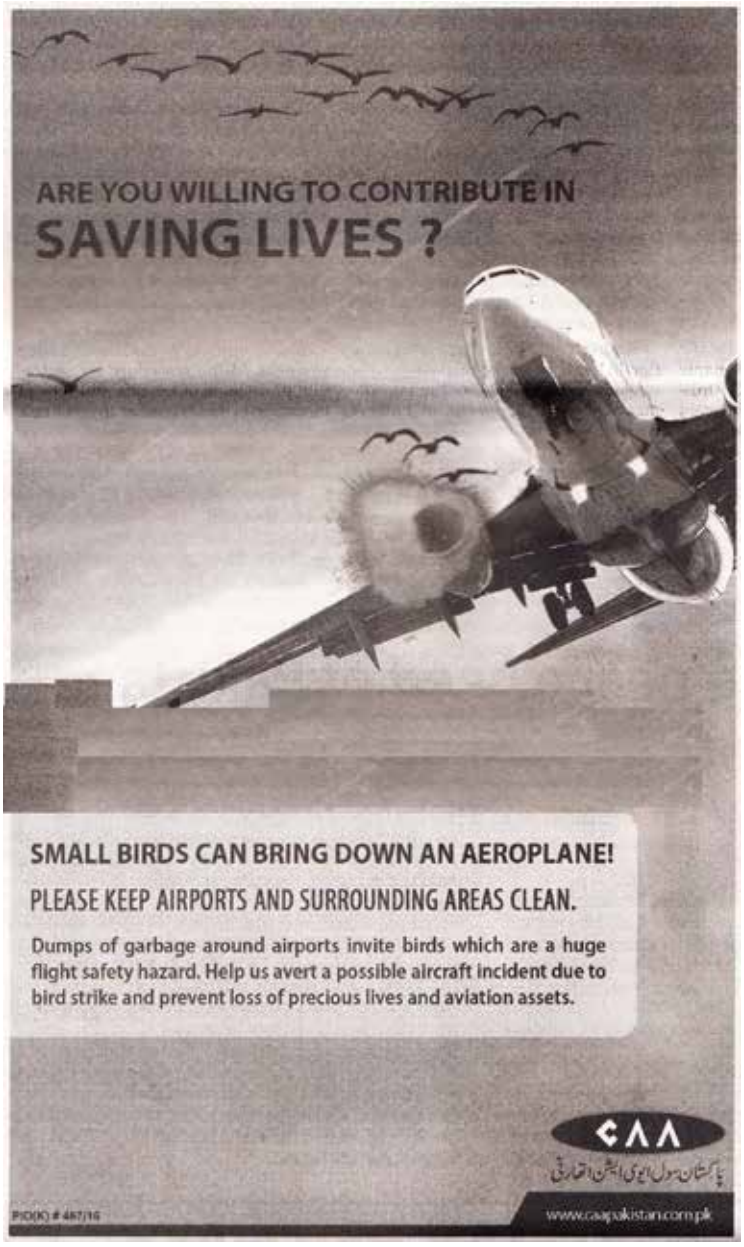
• Be aware of the potential for loss or erroneous air data and degraded flight control modes, including loss of envelope protection or limiting, unreliable airspeed, propulsion systems in alternate mode.

Bird strikes during approach or landing

• If the landing is assured, continuing the approach to landing is the preferred option. If more birds are encountered, fly through the bird flock and land.

PAKISTAN CIVIL AVIATION AUTHORITY

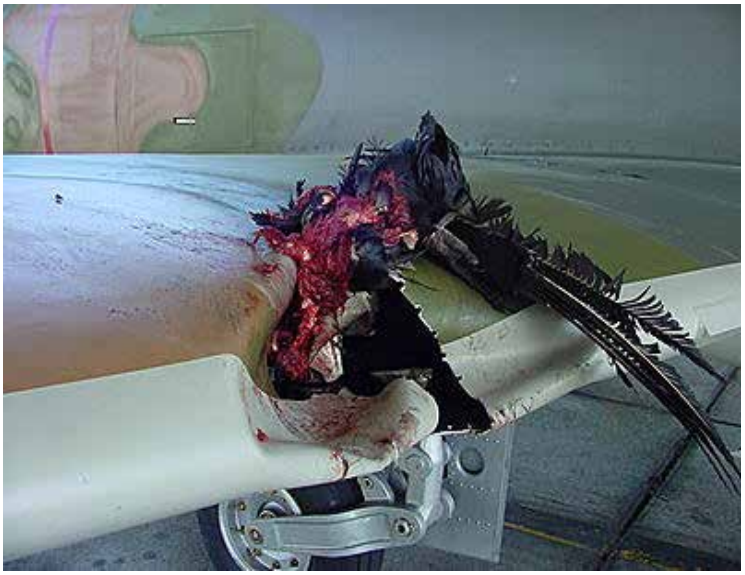
The Pakistan Civil Aviation Authority (PCAA) has launched countrywide campaign on Bird Aircraft Strike Hazard at major airports including Benazir Bhutto Islamabad International Airport.The key objective of this campaign is to create awareness about the issue of bird strike on the aircraft and its implications on the aviation industry, ensuring safe flight operations at the airports, informed Fariha Tahir Shah, Campaign Owner and Joint Director PR at CAA.



Major stakeholders who can help prevent bird activity around airports are general public, especially people living around airports and commercial places around airports which can create environmental hazards encouraging bird activity. Media and local cable operators can also play a pivotal role by creating

Bird Strike

continue or reject the takeoff is made using the criteria found in the Rejected Takeoff maneuver of the QRH. If a bird strike occurs above 80 knots and prior to V1, and there is no immediate evidence of engine failure (e.g., failure, fire, power loss, or surge/stall), the preferred option is to continue with the takeoff followed by an immediate return, if required.



DETECTING A BIRD STRIKE WHILE IN FLIGHT

VISUAL:
Birds seen in close proximity to the airplane or colliding with the airplane, bird remains on windshield, cracked windshield.

TACTILE:
Vibration of airframe or engine, thrust loss, asymmetric thrust, increased drag, abnormal airplane handling characteristics.

AUDITORY:
Noise of strike or noise attributed to resulting damage: engine surging, compressor stalls, aerodynamic noise from damaged radome, loss of pressurization from pressure vessel penetration.

OLFACTORY:
Smoke, odor, or cooked bird smell.

ENGINE INDICATIONS:
Reduction or fluctuation in primary power parameter (e.g., engine pressure ratio, fan speed, or equivalent), abnormal fuel flow, abnormal engine vibration monitoring (e.g., error vector magnitude or equivalent), engine failure, engine exceedances.

FLIGHT INSTRUMENTS:
Loss of data or erroneous indications arising from damage to air data sensors or angle-of-attack sensors.

OTHER AIRPLANE SYSTEMS OR STRUCTURE AFFECTED DIRECTLY BY A STRIKE:
Damaged communications or navigation antennas, damage to exposed electrical wiring or hydraulic lines, damaged radome or weather radar, broken landing lights, or cascading and multiple effects from sensor damage or engine damage.

RESPONSES TO A KNOWN OR SUSPECTED BIRD STRIKE

Immediate action
- Fly the airplane and maintain flight path control.
- Monitor flight and engine instruments.

Multiple engine failure or thrust loss
- Attempt to restart engine(s).

Severe engine damage
- Shut down engine according to procedure.

Strong engine vibration
- Reduce thrust, which will often reduce vibration.
- Shut down engine per flight crew operations manuals guidance.

Multiple engine ingestion and abnormal engine indications
- Air turnback or diversion to nearest suitable airport.

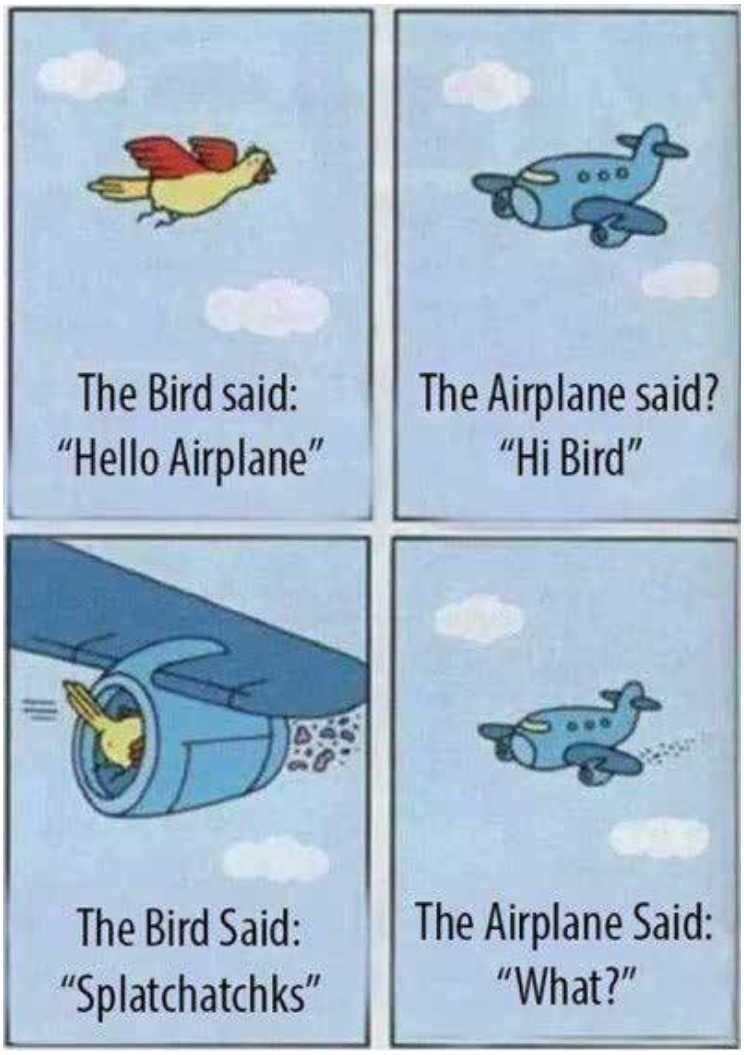
Known or suspected multiple engine ingestion, with normal engine indications
- Consider air turnback or diversion to nearest suitable airport.
- Reevaluate decision to continue with extended-range twin-engine operational performance standards, extended range operations, or overwater flight because engine damage or performance degradation may manifest later in the flight.

Known or suspected strikes with large flocking birds

Bird Strike

awareness on the hazards of bird activity, which causes aircraft collisions, she informed.

Key message that we want each stakeholder especially people residing or doing business to take away from this campaign is to keep their area clean from garbage, refuse and waste around airport sites. We make a strong appeal for a clean environment around airports to help us, keep you and your family safe at all times, she mentioned.



The Bird Aircraft Strike Hazard campaign comprises awareness sessions, advertisements, billboards, print, radio and electronic media campaign. Steps taken for bird control at the airports include deployment of airside inspectors and bird scarer for scaring birds by means of air sprays on the airfield, use of cartridges, fire crackers and de-nesting.

Along with that, inspectors take regular environmental visits to identify bird attractant sources around the airports till 14-km radius.The acceptable level of safety (ALOS) as recommended by International Civil Aviation Organization (ICAO) is 01 bird strike over 2000 flights. Pakistan Civil Aviation Authority consistently runs aircraft safety campaign every year to ensure that the messages are reinforced and appropriate actions are taken by all relevant quarters to maintain and safeguard operations for smooth flow of air traffic.

- Maintain as low a thrust setting as possible.
- If engine ingestion is suspected, limit reverse thrust on landing to the amount needed to stop on the runway. Reverse thrust may increase engine damage, especially when engine vibration or high exhaust gas temperature is indicated.

Post-flight actions following a known or suspected bird strike

- Report all known or suspected bird strikes or bird activity on or in the vicinity of the airport via established procedures. Ideally this information reaches all stakeholders, including air traffic control, the airport operator, the airline, airplane and engine manufacturers (particularly the local representative), the national regulatory authority, and the appropriate national bird-strike committee or aviation wildlife hazard group.

Weather Report

Winter - Foggy Days

Mist and Fog are the terms used to describe low visibility caused by water droplets suspended in the air. Mist is a term used to describe visibility of greater than 1 km while Fog is the term used when visibility is less than 1 km.

Fog is effectively surface cloud and has a significant impact on the conduct of flying operations particularly landing and take-off.

There are many different types of fog defined according to how they are formed;

Radiation Fog

Early morning radiation fog over central Brussels, October 2007.

On a cloudless night, especially within a high pressure system, the land surface loses heat to the atmosphere by radiation and cools. Moist air in contact with cooling surface also cools and when the temperature falls below the dew point for that air, fog forms. This type of fog is known as radiation fog.

Formation of Radiation Fog

Initially it may be mist that forms and then thickens into fog as the temperature drops and more water vapour condenses into water droplets in the air. Air does not conduct heat very well so in still air conditions fog may not form at all and a layer of dew or frost will form on the surface instead. However, if there is a light wind of around 5 kts, then this will mix the air in contact with the surface and the layer of fog will be thicker. With stronger winds, the fog may lift to form layers of Stratus.

Dispersal of Radiation Fog

As the sun rises, and the surface temperature increases, the air in contact with the surface will warm and the fog will gradually disperse. The fog may rise to form a low layer of stratus.

If the fog is particularly thick, then it may prevent the sun from heating the surface and the fog will not clear. This situation is common in the autumn in northern Europe when some airfields may be affected by fog for many days.

Anticipating Radiation Fog

The three conditions required for radiation fog are:

1. clear skies,
2. moist air, and
3. a light wind.

Advection Fog

Advection fog occurs when a warm, moist, air mass flows across a colder surface. The air mass is cooled from below by the colder surface and, if the temperature of the air mass is reduced to the dew point, then fog forms.

Formation of Advection Fog

Advection Fog is a regular springtime occurrence in coastal areas of north western Europe when relatively warm moist air moves towards land from offshore - the North Atlantic and waters around the British Isles - over colder land and shallow water surfaces.

Advection Fog can also occur over deep sea areas when warm maritime air passes over colder water such as that found in water flowing south from Arctic waters or where cold water wells up from the deep ocean.
In the Arctic, particularly in northern Canada, where there are wide expanses of water and numerous islands with small airstrips, advection fog is a significant impediment to aviation. Visibility can change from unlimited to zero in a

Frontal Fog and Hill Fog

Frontal fog occurs in two ways:

1. When, during the passage of a front, cloud extends down to the surface. This is especially the case over higher ground and may also be termed Hill Fog.
2. When the air in contact with the surface becomes saturated by evaporation from the rain that has fallen. These conditions may occur in the cold air ahead of a warm front.

Steam Fog

Steam Fog occurs when very cold air flows across relatively warm water. Water vapour evaporating from the surface of

the water rapidly cools below its dew point, as it is mixed with and cooled by the cold air, and condenses to form fog.

Formation of Steam Fog

Steam Fog, also known as Steaming Fog, Evaporation Fog, Frost Smoke or Arctic Sea Smoke, occurs when evaporation takes place into cold air lying over warmer water. It is usually quite shallow. This phenomenon is mainly a feature of higher latitudes especially in winter.

It is named by analogy with the condensed vapour or steam which appears above water which is heated. Invisible vapour is given off from the water but is almost immediately recondensed as it comes into contact with the colder air. The air has to be much colder than the water so that convection currents develop. Formation also requires that there is:

- A marked surface temperature inversion in the air before it moves over the sea or inland water bodies so as to preclude the lapse rate becoming unstable through a deep layer.
- A low air temperature, typically 0°C or below, so that a comparatively small amount of moisture can produce supersaturation, otherwise the heating process will outweigh the tendency towards saturation.

Because of these requirements, this type of fog is usually only formed over water surfaces near to a source of cold air, such as frozen ground or ice sheets in polar regions. One classic occurrence is following the sudden break up of sea ice to expose relatively warm water.

In the steep sided fjords along parts of the Icelandic and Norwegian Coasts and similar environments elsewhere, steam fog may reach a depth of 500 feet or more and drift over adjacent land areas. Whilst relatively rare in temperate latitudes, cold air which collects in and then drifts down large river valleys and out over a relatively warm sea surface, in very light wind conditions, can occasionally lead to the formation of smaller and much shallower areas of this type of fog in winter.

In a more ephemeral context but by exactly the same process, many people will have seen the steaming of tarred road surfaces or bitumen roofs in sunshine after rain.

Effects

- **Low visibility**. Low visibility in fog clearly affects flying operations..

AIRPORT OPERATIONS IN FOG

Reduced visibility because of fog may result in restrictions on both ground and airborne movements at an airport and both can have the effect of reducing capacity because of the safety-predicated consequences of Low Visibility Operations (LVO). Nowadays, with many more aircraft being able to land and take off in very low surface visibility, the ultimate capacity constraint can sometimes be maintaining the safety of aircraft ground movement.

SOLUTIONS

Radiation Fog

- When conditions for radiation fog exist, it is a good idea to examine the pattern of weather over the preceding days to see if fog has occurred and at what time of the day and at what temperature.
- Monitoring the temperature and dewpoint at an airport can help controllers and pilots alike to predict the onset of radiation fog and plan operations accordingly.
- If conducting local flying operations, such as flying training, beware getting airborne when there is early afternoon lifting of fog while conditions for radiation fog still exist - you could find yourself spending the night somewhere else!

Frontal Fog

- Flying at low level, i.e. below safety altitude, in conditions of frontal fog and low cloud can quickly become extremely hazardous if visual flight rules cannot be maintained. Attempting to fly between layers of Stratus, so-called "letter boxing", can result in impact with terrain CFIT if forward visibility and Situational Awareness is lost.

Advection Fog

- In circumstances where advection fog can quickly make an aerodrome unusable, the same risk may apply to potential diversions as well and pilots should ensure that an appropriate fuel endurance is available and that alternates unlikely to be affected by advection fog remain within range in the event that the destination weather deteriorates unexpectedly.

Airport Operations

- Crews and controllers should exercise additional caution during low visibility operations - loss of situational awareness is a major contributory factor in Runway Incursion events.
- Airports should ensure that collaborative decision making arrangements to maximise airport capacity involve met service providers.

Bird Strike

Check your understanding of the topic by guessing how many of these you can guess correctly

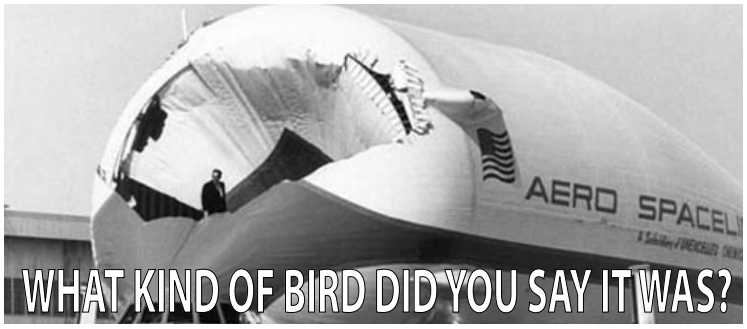
There are many misconceptions by air travelers and the general public about the threat posed by birds to aircraft and their occupants. The following facts should shed some light on some of these issues.

Myth - Bird strikes can't cause serious airline accidents.
Fact - Since 1975, five large jet airliners have had major accidents where bird strikes played a significant role. In one case, about three dozen people were killed. On the military side, since 1980 at least five large aircraft, including two E-3 AWACs and one B-1B, have crashed as a result of bird strikes.
Selected bird related accidents to military and civil aircraft

Fact - According to statistics from the International Civil Aviation Organization (ICAO), there were over 25,000 bird strikes reported to civil aircraft between 1988 and 1992.

Myth - Large aircraft are built to withstand all bird strikes.
Fact - Large commercial aircraft like passenger jets are certified to be able to withstand the impact of most, but not all birds. For example, large modern jets must be able to safely land after being struck by a four pound bird anywhere on the aircraft at normal operating speeds.
Myth - If a bird flies into an engine during takeoff and the engine quits, the airplane will crash.

Fact - Large commercial jets are designed so that if any one engine is unable to continue generating thrust, the airplane will have enough power from the remaining engine or engines to safely complete the flight.



Myth - Nothing can be done to keep birds away from airports.
Fact - There are a number of effective techniques that can reduce the number of birds in the airport area. In general, the techniques fall into three categories: making the environment unattractive for birds, scaring the birds, or reducing the bird population.

Myth - It is illegal to kill birds just to protect aircraft.
Fact - There are some birds such as pigeons and starlings which are not protected speciesand may be killed if they pose a threat to aircraft.
Otherbirds, such as ducks, geese, or gulls, may be killed by an airport authority after obtaining the appropriate permits. Endangered species may not be deliberately killed under any circumstances.

Myth - If birds are a problem at an airport, killing them all would eliminate the problem
Fact - Even if it were legal to do so, killing off all birds will not solve the problem. An airport is an integral part of the local ecosystem, and like in all ecosystems each plant or animal species plays an important role. Eliminating any one problem species will only lead to some other species taking its place. A combination of bird control measures which take into account the local ecosystem is superior long term solution.

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