Statistical Summary of Commercial Jet Airplane Accidents
Worldwide Operations 1959 - 2011
Introduction

The accident statistics presented in this summary are confined to worldwide commercial jet airplanes that are heavier than 60,000 pounds maximum gross weight. Within that set of airplanes, there are two groups excluded:

1) Airplanes manufactured in the Commonwealth of Independent States (CIS) or the Union of Soviet Socialist Republics (USSR) are excluded because of the lack of operational data; and

2) Commercial airplanes operated in military service. (However, if a military-owned commercial jet transport is used for civilian commercial service, those data will be included in this summary.)

The following airplanes are included in the statistics:

- 717
  - DC-8
  - A300
  - BAe 146
  - F-28
  - Concorde
  - L-1011
  - BAC 1-11
  - Comet 4
- 707/720
  - DC-9
  - A300-600
  - Avro RJ-70/-85/-100
  - F-70
- 727
  - DC-10/MD-10
  - A310
  - CRJ-700/-900/-1000
  - F-100
- 737
  - MD-11
  - A320/321/319/318
  - EMB-170/-190
- 747
  - MD-80/-90
  - A330
  - A340
  - A380
- 757
- 767
- 777
- 787

Flight operations data for Boeing airplanes are developed internally from airline operator reports. Flight operations data for non-Boeing airplanes are compiled from www.ascendworldwide.com, by Ascend. The source of jet airplane inventory data is Jet Information Services, Inc.

Accident data are obtained, when available, from government accident reports. Otherwise, information is from operators, manufacturers, various government and private information services, and press accounts.

Readers may note that cumulative accident totals from year to year may not exactly correlate with the expected change from the previous year’s accidents. This is a result of periodic audits of the entire accident history for updates to the data.

Definitions related to development of statistics in this summary are primarily based on corresponding International Civil Aviation Organization (ICAO), National Transportation Safety Board (NTSB), and Flight Safety Foundation (FSF) terms, as explained in the next section.
Definitions

Airplane Accident: An occurrence associated with the operation of an airplane that takes place between the time any person boards the airplane with the intention of flight and such time as all such persons have disembarked, in which:

- Death or serious injury results from:
  - Being in the airplane; or
  - Direct contact with the airplane or anything attached thereto; or
  - Direct exposure to jet blast;

Excluding:
- Fatal and nonfatal injuries from natural causes; and
- Fatal and nonfatal self-inflicted injuries or injuries inflicted by other persons; and
- Fatal and nonfatal injuries of stowaways hiding outside the areas normally available to the passengers and crew; and
- Nonfatal injuries resulting from atmospheric turbulence, maneuvering, loose objects, boarding, disembarking, evacuation, and maintenance and servicing; and
- Nonfatal injuries to persons not aboard the airplane; or

- The airplane sustains substantial damage; or
- The airplane is missing or is completely inaccessible.

The following occurrences are not considered airplane accidents – those that are the result of experimental test flights or the result of a hostile action, including sabotage, hijacking, terrorism, and military action.

Note: This is generally consistent with the ICAO and the NTSB definition of an accident (see the Referenced ICAO and NTSB Definitions section). The differences are:

1) The ICAO and NTSB references to “aircraft” were changed to “airplane” and references to propellers and rotors were eliminated; and

2) This publication excludes events that result in nonfatal injuries from atmospheric turbulence, maneuvering, etc.; nonfatal injuries to persons not aboard the airplane; and any events that result from an experimental test flight or from hostile action, such as sabotage, hijacking, terrorism, and military action.

Note: Within this publication, the term “accident” is used interchangeably with “airplane accident.”
Definitions (continued)

**Destroyed:** The estimated or likely cost of repairs would have exceeded 50 percent of the new value of the airplane had it still been in production at the time of the accident.

*Note:* This definition is consistent with the FSF definition. NTSB defines “destroyed” as damaged due to impact, fire, or in-flight failures to an extent not economically repairable.

**Fatal Injury:** Any injury that results in death within 30 days of the accident.

*Note:* This is consistent with both the ICAO and the NTSB definitions.

**Major Accident:** An accident in which any of three conditions is met:

- The airplane was destroyed; or
- There were multiple fatalities; or
- There was one fatality and the airplane was substantially damaged.

*Note:* This definition is consistent with the NTSB definition. It also is generally consistent with FSF, except that the FSF definition specifies that fatalities include only occupants of the airplane. ICAO does not normally define the term “major accident.”

**Serious Injury:** An injury which is sustained by a person in an accident and which:

- Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose); or
- Involves lacerations which cause severe hemorrhage, nerve, muscle, or tendon damage; or
- Involves injury to any internal organ; or
- Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface; or
- Involves verified exposure to infectious substances or injurious radiation.

*Note:* This is consistent with the ICAO definition. It is also consistent with NTSB’s except for the last bullet item, which is not included in the NTSB definition.
Definitions (continued)

**Substantial Damage:** Damage or failure which adversely affects the structural strength, performance, or flight characteristics of the airplane, and which would normally require major repair or replacement of the affected component. Substantial damage is **not** considered to be:

- Engine failure or damage limited to an engine if only one engine fails or is damaged
- Bent fairings or cowlings
- Dents in the skin
- Small puncture holes in the skin
- Damage to wheels
- Damage to tires
- Damage to flaps
- Damage to engine accessories
- Damage to brakes
- Damage to wingtips

**Note 1.** – *This is generally consistent with the NTSB definition of substantial damage except: 1) It deletes reference to “puncture holes in the fabric” and “ground damage to rotor or propeller blades”; and 2) It deletes “damage to landing gear” from the list of items not considered to be substantial damage.*

**Note 2.** – *ICAO does not define the term substantial damage. Still, the above definition is generally consistent with the ICAO definition of structural damage contained within part (b) of the ICAO accident definition.*
Boeing Terms

The terms on this page were created by Boeing for this publication and do not have corresponding equivalents in ICAO, NTSB, etc.

**Accident Rates:** In general, this expression is a measure of accidents per million departures. Departures (or flight cycles) are used as the basis for calculating rates, since there is a stronger statistical correlation between accidents and departures than there is between accidents and flight hours, or between accidents and the number of airplanes in service, or between accidents and passenger miles or freight miles. Airplane departures data are continually updated and revised as new information and estimating processes become available. These form the baseline for the measure of accident rates and, as a consequence, rates may vary between editions of this publication.

**Airplane Collisions:** Events involving two or more airplanes are counted as separate events, one for each airplane. For example, destruction of two airplanes in a collision is considered to be two separate accidents.

**Fatal Accident:** An accident that results in fatal injury.

**Hull Loss:** Airplane totally destroyed or damaged and not repaired. Hull loss also includes but is not limited to events in which:

- The airplane is missing; or
- The search for the wreckage has been terminated without it being located; or
- The airplane is completely inaccessible.

*Note: Neither ICAO nor NTSB has a definition for hull loss.*
Exclusions

Certain airplanes and events are excluded from consideration as accidents in this summary. This is a complete list of those exclusions.

Excluded Airplanes

Airplanes manufactured in the Commonwealth of Independent States (CIS) or the Union of Soviet Socialist Republics (USSR) are excluded because of the lack of operational data. Commercial airplanes operated in military service are also excluded. (However, if a military-owned commercial jet transport is used for civilian commercial service, those data are included in this summary.)

Excluded Events

- Fatal and nonfatal injuries from natural causes;
- Fatal and nonfatal self-inflicted injuries or injuries inflicted by other persons;
- Fatal and nonfatal injuries of stowaways hiding outside the areas normally available to the passengers and crew;
- Nonfatal injuries resulting from atmospheric turbulence, maneuvering, loose objects, boarding, disembarking, evacuation, and maintenance and servicing;
- Nonfatal injuries to persons not aboard the airplane;
- Experimental test flights (however, maintenance test flights, ferry, positioning, training, and demonstration flights are not excluded);
- Sabotage, hijacking, terrorism, and military action.
Referenced ICAO and NTSB Definitions

International Civil Aviation Organization (ICAO) and National Transportation Safety Board (NTSB) definitions are included below for reference.

Accident

ICAO defines an accident as follows:
An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

a) A person is fatally or seriously injured as a result of:
   • Being in the aircraft, or
   • Direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
   • Direct exposure to jet blast,
   except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) The aircraft sustains damage or structural failure which:
   • Adversely affects the structural strength, performance, or flight characteristics of the aircraft, and
   • Would normally require major repair or replacement of the affected component,
   except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or

   c) The aircraft is missing or is completely inaccessible.

NTSB defines an aircraft accident as follows:
Aircraft accident means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.
Referenced ICAO and NTSB Definitions (continued)

Serious Injury

ICAO defines serious injury as follows:

An injury which is sustained by a person in an accident and which:

a) Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
b) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose); or
c) Involves lacerations which cause severe hemorrhage, nerve, muscle, or tendon damage; or
d) Involves injury to any internal organ; or
e) Involves second or third degree burns, or any burns affecting more than 5 percent of the body surface; or
f) Involves verified exposure to infectious substances or injurious radiation.

NTSB defines serious injury as follows:

Serious injury means any injury which:

1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;
2) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);
3) Causes severe hemorrhages, nerve, muscle, or tendon damage;
4) Involves any internal organ; or
5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Substantial Damage

NTSB defines substantial damage as follows:

Damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and that would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small puncture holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage."

ICAO does not define the term substantial damage.
## 2011 Airplane Accidents
### All Accidents – Worldwide Commercial Jet Fleet

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<th>Type of Operation</th>
<th>Accident Location</th>
<th>Phase of Flight</th>
<th>Event Description</th>
<th>Damage Category</th>
<th>Hull Loss</th>
<th>Injury Category</th>
<th>Onboard Fatalities / Occupants</th>
<th>Major Accident</th>
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</thead>
<tbody>
<tr>
<td>3-Jan-11</td>
<td>American Airlines</td>
<td>737-800</td>
<td>(&lt; 1)</td>
<td>Sched Pax</td>
<td>Los Angeles, USA</td>
<td>Takeoff</td>
<td>The airplane sustained a tail strike during takeoff. The flight continued to its destination, landing safely. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-Jan-11</td>
<td>Iran Air</td>
<td>727</td>
<td>(near)</td>
<td>Sched Pax</td>
<td>Shumiyeh, Iran</td>
<td>Final Approach</td>
<td>The airplane crashed in a field approximately 9 NM southeast of the airport while executing a missed approach at night in poor weather.</td>
<td>Destroyed</td>
<td>X</td>
<td>Fatal</td>
<td>78/105 (0)</td>
<td></td>
</tr>
<tr>
<td>10-Jan-11</td>
<td>AirAsia</td>
<td>A320</td>
<td>(3)</td>
<td>Sched Pax</td>
<td>Kuching, Malaysia</td>
<td>Landing</td>
<td>The airplane lost directional control during the landing roll, veering off the side of the runway, where the nose landing gear collapsed. There were several minor injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Jan-11</td>
<td>Africa Charter Airline</td>
<td>737-200</td>
<td>(30)</td>
<td>Ferry Pax</td>
<td>Hoedspruit, South Africa</td>
<td>Taxi</td>
<td>The airplane was being powered backwards when it rolled off the side of the taxiway, coming to rest part way down a steep embankment. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-Jan-11</td>
<td>American Airlines</td>
<td>757</td>
<td>(3)</td>
<td>Sched Pax</td>
<td>Los Angeles, USA</td>
<td>Takeoff</td>
<td>The airplane sustained a tail strike during takeoff, leveled off, and returned to the departure airport, landing safely. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>16-Feb-11</td>
<td>Saudi Arabian Airlines</td>
<td>747-300</td>
<td>(24)</td>
<td>Sched Pax</td>
<td>Madinah, Saudi Arabia</td>
<td>Landing</td>
<td>During landing, the airplane veered off the side of the runway. The left main landing gear was damaged and both left engines contacted the ground. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>24-Feb-11</td>
<td>US Airways</td>
<td>ERJ190</td>
<td>(3)</td>
<td>Sched Pax</td>
<td>New York, USA</td>
<td>Landing</td>
<td>During the landing roll, the aft galley cart rolled forward due to improper latching, striking a passenger's ankle.</td>
<td></td>
<td></td>
<td>Serious</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27-Mar-11</td>
<td>Hapag-Lloyd Flug</td>
<td>737-800</td>
<td>(11)</td>
<td>Sched Pax</td>
<td>Tenerife, Spain</td>
<td>Takeoff</td>
<td>The airplane rejected the takeoff after the tail contacted the runway. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>30-Mar-11</td>
<td>Northern Air Cargo</td>
<td>737-300</td>
<td>(23)</td>
<td>Ferry Pax</td>
<td>Dayton, USA</td>
<td>Initial Climb</td>
<td>While departing on a positioning flight, an unsecured pallet jack in the otherwise empty cargo hold struck and fractured a structural frame. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11-Apr-11</td>
<td>Comair</td>
<td>CRJ700</td>
<td>(7)</td>
<td>Sched Pax</td>
<td>New York, USA</td>
<td>Taxi</td>
<td>The airplane was holding while waiting to taxi onto its stand when the left wingtip of a taxing A380 struck its vertical stabilizer. The impact force swung the airplane about 90 degrees. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13-Apr-11</td>
<td>Air France</td>
<td>A330</td>
<td>(9)</td>
<td>Sched Pax</td>
<td>Caracas, Venezuela</td>
<td>Landing</td>
<td>The airplane sustained a hard landing in poor weather and gusty winds. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-Apr-11</td>
<td>China Cargo</td>
<td>777</td>
<td>(&lt;1)</td>
<td>Sched Cargo</td>
<td>Copenhagen, Denmark</td>
<td>Landing</td>
<td>After making a hard, bounced landing, the crew elected to go around. During the takeoff, the airplane was damaged by a tail strike. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6-May-11</td>
<td>Continental Airlines</td>
<td>737-800</td>
<td>(12)</td>
<td>Ferry Pax</td>
<td>Greenville, USA</td>
<td>Taxi</td>
<td>During taxi, a portion of the concrete tarmac collapsed under the left main landing gear due to a large sinkhole. Both the landing gear and the left engine were damaged. There were no injuries.</td>
<td>Substantial</td>
<td></td>
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# 2011 Airplane Accidents

## All Accidents – Worldwide Commercial Jet Fleet

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<th>Major Accident</th>
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<tbody>
<tr>
<td>18-May-11</td>
<td>Omega Air Inc.</td>
<td>707 (42)</td>
<td>Charter Cargo</td>
<td>Point Mugu NAS, USA</td>
<td>Initial Climb</td>
<td>Just after liftoff, the left inboard engine and pylon separated from the wing and struck the left outboard engine. The crew aborted the flight and touched down on the runway. The airplane departed the side of the runway and stopped in an estuary. It was destroyed by impact and post-crash fire. Three crew members sustained minor evacuation injuries.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>28-May-11</td>
<td>SBA Airlines</td>
<td>767 (20)</td>
<td>Sched Pax</td>
<td>Caracas, Venezuela</td>
<td>Landing</td>
<td>The airplane sustained damage during a hard landing. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Jun-11</td>
<td>Malev Hungarian Airlines</td>
<td>737-800 (8)</td>
<td>Sched Pax</td>
<td>Heraklion, Greece</td>
<td>Landing</td>
<td>The airplane sustained damage from a tail strike on landing. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-Jul-11</td>
<td>Hewa Bora Airways</td>
<td>727 (46)</td>
<td>Sched Pax</td>
<td>Kisangani, Congo DR</td>
<td>Final Approach</td>
<td>The airplane crashed short of the runway while on final approach. The airplane broke up and caught fire. The accident happened in daylight, but in heavy weather and reduced visibility.</td>
<td>Destroyed</td>
<td>X</td>
<td>Fatal</td>
<td>83/118 (0)</td>
<td>X</td>
</tr>
<tr>
<td>14-Jul-11</td>
<td>Delta Connection</td>
<td>CRJ 900 (2)</td>
<td>Sched Pax</td>
<td>Boston, USA</td>
<td>Taxi</td>
<td>The airplane was holding for departure when the winglet of a taxiing 767 contacted the vertical and horizontal stabilizers. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-Jul-11</td>
<td>Asiana Airlines</td>
<td>747-400 (5)</td>
<td>Sched Cargo</td>
<td>East China Sea near Jeju Island, South Korea</td>
<td>Cruise</td>
<td>After reporting a cargo fire and the need to divert, the airplane disappeared from radar contact while descending. It was found to have crashed in the East China Sea.</td>
<td>Destroyed</td>
<td>X</td>
<td>Fatal</td>
<td>2/2 (0)</td>
<td>X</td>
</tr>
<tr>
<td>29-Jul-11</td>
<td>Egyptair</td>
<td>777 (14)</td>
<td>Sched Pax</td>
<td>Cairo, Egypt</td>
<td>Load /Unload</td>
<td>While parked at the gate, preparing for departure, the airplane’s flight crew ordered an evacuation of the airplane due to smoke and fire on the flight deck. All passengers and crew evacuated through the jetways, which were still in place. There were several minor injuries to fire fighters.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-Jul-11</td>
<td>Caribbean Airlines Limited</td>
<td>737-800 (4)</td>
<td>Sched Pax</td>
<td>Georgetown, Guyana</td>
<td>Landing</td>
<td>After touching down, the airplane skidded off the end of the runway, ran through a perimeter fence, and broke in two.</td>
<td>Destroyed</td>
<td>X</td>
<td>Serious</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>20-Aug-11</td>
<td>First Air</td>
<td>737-200 (36)</td>
<td>Charter Pax</td>
<td>Resolute Bay, Canada</td>
<td>Final Approach</td>
<td>The airplane broke apart when it impacted a small hill while on landing approach in reduced visibility. The last Air Traffic Control contact was reported by a normal call approximately 8 km from the airport.</td>
<td>Destroyed</td>
<td>X</td>
<td>Fatal</td>
<td>12/15 (0)</td>
<td>X</td>
</tr>
<tr>
<td>29-Aug-11</td>
<td>Gulf Air</td>
<td>A320 (1)</td>
<td>Sched Pax</td>
<td>Cochin, India</td>
<td>Landing</td>
<td>On final approach, the airplane encountered heavy rain and gusty winds. On touchdown, the airplane veered off the side of the runway onto the grass and came to rest with its nose landing gear collapsed.</td>
<td>Substantial</td>
<td>Serious</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Sep-11</td>
<td>Turkish Airlines</td>
<td>A340 (15)</td>
<td>Sched Pax</td>
<td>Mumbai, India</td>
<td>Landing</td>
<td>After landing, the airplane veered off the side of the runway onto soft ground as it exited the runway via high speed taxiway. There were no injuries.</td>
<td>Substantial</td>
<td></td>
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### All Accidents – Worldwide Commercial Jet Fleet

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<td>3-Sep-11</td>
<td>Mahan Air</td>
<td>A300-600 (21)</td>
<td>Sched Pax</td>
<td>Mashad, Iran</td>
<td>Landing</td>
<td>After a hard landing that burst a nose wheel tire, the airplane veered off the runway where the nose landing gear collapsed.</td>
<td>Substantial</td>
<td>Serious</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>16-Sep-11</td>
<td>TAME</td>
<td>EMB 190 (5)</td>
<td>Sched Pax</td>
<td>Quito, Ecuador</td>
<td>Landing</td>
<td>The airplane overran the runway on landing, struck a localizer antenna and came to rest after impacting the airport perimeter wall. The accident happened at night in poor weather. There were no injuries.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Sep-11</td>
<td>Aeropostal</td>
<td>DC-9 (35)</td>
<td>Sched Pax</td>
<td>Puerto Ordaz, Venezuela</td>
<td>Landing</td>
<td>The airplane sustained a hard landing. Both engine pylons separated at the fuselage attach points. The airplane stopped on the runway. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-Oct-11</td>
<td>Delta Airlines</td>
<td>MD-88 (23)</td>
<td>Sched Pax</td>
<td>Atlanta, USA</td>
<td>Tow</td>
<td>During pushback from the gate, while turning the airplane, the tug contacted the forward fuselage and nose landing gear. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Oct-11</td>
<td>Sky Airlines</td>
<td>737-400 (18)</td>
<td>Charter Pax</td>
<td>Antalya, Turkey</td>
<td>Landing</td>
<td>The airplane conducted a smooth high speed landing after the flaps were unable to be extended to a landing position. After a reported gear shimmy, the right main landing gear collapsed and the airplane slid to a stop on the left main gear, nose gear and right engine pod. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-Oct-11</td>
<td>Iran Air</td>
<td>727 (37)</td>
<td>Sched Pax</td>
<td>Tehran, Iran</td>
<td>Landing</td>
<td>The airplane landed with its nose landing gear retracted. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Nov-11</td>
<td>LOT Polish Airlines</td>
<td>767 (14)</td>
<td>Sched Pax</td>
<td>Warsaw, Poland</td>
<td>Landing</td>
<td>The airplane landed with all three landing gear retracted. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Nov-11</td>
<td>SA-Airlink</td>
<td>RJ-85 (15)</td>
<td>Sched Pax</td>
<td>Johannesburg, South Africa</td>
<td>Landing</td>
<td>The airplane touched down with its nose landing gear retracted and came to rest on its nose on the runway. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-Dec-11</td>
<td>Air Canada</td>
<td>A321 (10)</td>
<td>Sched Pax</td>
<td>Fort Lauderdale, USA</td>
<td>Taxi</td>
<td>The airplane was stopped abruptly during taxi for departure due to a potential incursion with another airplane vacating the runway.</td>
<td>Serious</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-Dec-11</td>
<td>Sriwijaya Air</td>
<td>737-300 (15)</td>
<td>Sched Pax</td>
<td>Yogyakarta, Indonesia</td>
<td>Landing</td>
<td>After landing in heavy rain, the airplane came to a stop on soft ground left of and about 25 meters past the end of the runway. Both the right main and nose landing gear collapsed. Several minor injuries occurred during evacuation.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Dec-11</td>
<td>Austrian Airlines</td>
<td>A321 (10)</td>
<td>Sched Pax</td>
<td>Manchester, England</td>
<td>Go Around</td>
<td>After encountering heavy turbulence on final approach, the crew elected to go around. After initiating the go-around, a windshear caused the airplane landing gear to briefly contact the runway. The tail struck the runway as the airplane took off. The second landing was uneventful. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Dec-11</td>
<td>AMC Airlines</td>
<td>MD-83 (15)</td>
<td>Charter Pax</td>
<td>Karachi, Pakistan</td>
<td>Landing</td>
<td>After unsuccessful troubleshooting, the airplane landed with its nose landing gear retracted. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 36 Total Accidents

<table>
<thead>
<tr>
<th>Hull Loss</th>
<th>Injury Category</th>
<th>Onboard Fatalities / Occupants (External Fatalities)</th>
<th>Major Accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>175 Onboard (0) External</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
**Departures, Flight Hours, and Jet Airplanes in Service**

**Worldwide Operations 1992 Through 2011**

- 610 million departures since 1959 (458 million on Boeing airplanes)
- 1,094 million flight hours since 1959 (826 million on Boeing airplanes)

* Certified jet airplanes greater than 60,000 pounds maximum gross weight, including those in temporary non-flying status and those in use by non-airline operators. Excluded are commercial airplanes operated in military service and CIS/USSR-manufactured airplanes.

Source: Jet Information Services, Inc.
## Accident Summary by Type of Operation
### Worldwide Commercial Jet Fleet

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>All Accidents</th>
<th>Fatal Accidents</th>
<th>Onboard Fatalities (External Fatalities)*</th>
<th>Hull Loss Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>1,424</td>
<td>317</td>
<td>483</td>
<td>63</td>
</tr>
<tr>
<td>- Scheduled</td>
<td>1,307</td>
<td>294</td>
<td>437</td>
<td>60</td>
</tr>
<tr>
<td>- Charter</td>
<td>117</td>
<td>23</td>
<td>46</td>
<td>3</td>
</tr>
<tr>
<td>Cargo</td>
<td>252</td>
<td>74</td>
<td>76</td>
<td>13</td>
</tr>
<tr>
<td>Maintenance test, ferry, positioning, training, and demonstration</td>
<td>122</td>
<td>13</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>1,798</td>
<td>404</td>
<td>603</td>
<td>79</td>
</tr>
<tr>
<td>U.S. and Canadian Operators</td>
<td>555</td>
<td>78</td>
<td>180</td>
<td>11</td>
</tr>
<tr>
<td>Rest of World</td>
<td>1,243</td>
<td>326</td>
<td>423</td>
<td>68</td>
</tr>
<tr>
<td>Totals</td>
<td>1,798</td>
<td>404</td>
<td>603</td>
<td>79</td>
</tr>
</tbody>
</table>

*External fatalities include on-ground fatalities as well as fatalities on other aircraft involved.
Accident Summary by Injury and Damage
All Accidents – Worldwide Commercial Jet Fleet

1959 Through 2011

- 603 Fatal Accidents (34% of Total)
  - 491 fatal accidents with hull loss
  - 25 fatal accidents with substantial damage
  - 87 fatal accidents without substantial damage

- 1195 Non-Fatal Accidents (66% of Total)
  - 432 hull loss without fatalities
  - 702 substantial damage without fatalities
  - 61 accidents without substantial damage (but with serious injuries)

Total 1798

2002 Through 2011

- 79 Fatal Accidents (20% of Total)
  - 69 fatal acc. w/ hull loss
  - 1 fatal accident with substantial damage
  - 9 fatal accidents without substantial damage

- 325 Non-Fatal Accidents (80% of Total)
  - 112 hull loss without fatalities
  - 196 substantial damage without fatalities
  - 17 accidents without substantial damage (but with serious injuries)

Total 404

Number of Accidents
Accident Rates and Onboard Fatalities by Year

Annual accident rate (per million departures)

- All accident rate
- Fatal accident rate
- Hull loss accident rate
- Onboard fatalities

Year

Accident Rates and Onboard Fatalities by Year

Annual onboard fatalities
U.S. and Canadian Operators Accident Rates by Year

Annual fatal accident rate (per million departures)

Rest of the world
U.S. & Canadian operators

1992 Through 2011

Year
10-Year Accident Rates by Type of Operation

*Charter passenger, charter cargo, scheduled cargo, maintenance test, ferry, positioning, training, and demonstration flights
### Accident Rates by Airplane Type


The Comet, CV880/990, Caravelle, Concorde, Mercure, Trident and VC-10 are no longer in commercial service.

**These types have accumulated fewer than 1 million departures.

<table>
<thead>
<tr>
<th>Hull Losses (H/L)</th>
<th>Hull with Fatalities</th>
<th>Hull loss accident rate (per million departures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>53</td>
<td>4.64/8.68</td>
</tr>
<tr>
<td>153</td>
<td>74</td>
<td>4.27/8.83</td>
</tr>
<tr>
<td>75</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>54 **</td>
<td>4.01/5.89</td>
</tr>
<tr>
<td>92</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>12 **</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>19 **</td>
<td>2.38/4.64</td>
</tr>
<tr>
<td>27</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td></td>
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<tr>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

- Hull loss accident rate – total bar
- Hull loss with fatalities accident rate – lighter shaded portion

*The Comet, CV880/990, Caravelle, Concorde, Mercure, Trident and VC-10 are no longer in commercial service.

**These types have accumulated fewer than 1 million departures.
Fatal Accidents and Onboard Fatalities by Phase of Flight

<table>
<thead>
<tr>
<th>Phase of Flight</th>
<th>Fatal Accidents</th>
<th>Onboard Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi, load/ unload</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>parked, tow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takeoff</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Initial climb</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Climb (flaps up)</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Cruise</td>
<td>11%</td>
<td>22%</td>
</tr>
<tr>
<td>Descent</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Initial approach</td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td>Final approach</td>
<td>16%</td>
<td>13%</td>
</tr>
<tr>
<td>Landing</td>
<td>20%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Percentage of fatal accidents and onboard fatalities:
- Initial approach: 14%
- Final approach: 29%
- Cruise: 57%
- Climb: 14%
- Takeoff: 6%
- Initial climb: 6%
- Taxi, load/unload parked, tow: 11%

Distribution of fatal accidents and onboard fatalities:

Percentages may not sum precisely due to numerical rounding.

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CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories

The International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST), which includes government officials and aviation industry leaders, have jointly chartered the CAST/ICAO Common Taxonomy Team (CICTT). CICTT includes experts from several air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, ICAO, and members from Canada, the European Union, France, Italy, the Netherlands, the United Kingdom, and the United States. CICTT is co-chaired by a representative from ICAO and CAST.

The team is charged with developing common taxonomies and definitions for aviation accident and incident reporting systems. Common taxonomies and definitions establish a standard industry language, thereby improving the quality of information and communication. With this common language, the aviation community’s capacity to focus on common safety issues is greatly enhanced.

The CICTT Aviation Occurrence Taxonomy is designed to permit the assignment of multiple categories as necessary to describe the accident or incident. Since 2001, the Safety Indicator Steering Group (SISG) has met annually to assign CICTT occurrence categories to the prior year’s accidents.

In a separate activity, the CAST assigned each accident to a single principal category. Those accident assignments and a brief description of the categories are reported in the preceding chart.

The CAST use of principal categories has been instrumental in focusing industry and government efforts and resources on accident prevention. Pareto charts using principal categories are used by CAST to identify changes to historic risk and to help to determine if the safety enhancements put in place are effective.

For a complete description of the categories go to: http://www.intlaviationstandards.org/
Fatalities by CAST/ICAO Common Taxonomy Team (CICTT)
Aviation Occurrence Categories

Number of fatal accidents (79 total)
- LOC-I: 18
- CFIT: 18
- RE (Landing) + ARC + USOS: 15
- UNK: 4
- MAC: 2
- SCF-NP: 1
- RE (Takeoff): 5
- OTHR: 2
- WSTRW: 1
- FUEL: 1
- RAMP: 8
- F-NI: 2
- SCF-PP: 2

Note: Principal categories as assigned by CAST.