

# Statistical Summary of Commercial Jet Airplane Accidents

Worldwide Operations | 1959 – 2013



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# Introduction

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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.
- 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:

|         |             |                  |                     |       |          |        |          |             |
|---------|-------------|------------------|---------------------|-------|----------|--------|----------|-------------|
| 707/720 | 717         | A300             | BAe146              | F-28  | Concorde | L-1011 | BAC 1-11 | Comet 4     |
| 727     | DC-8        | A300-600         | Avro RJ-70/-85/-100 | F-70  |          |        |          | Trident     |
| 737     | DC-9        | A310             | CRJ-700/-900/-1000  | F-100 |          |        |          | Caravelle   |
| 747     | DC-10/MD-10 | A320/321/319/318 | EMB-170/-175        |       |          |        |          | Mercure     |
| 757     | MD-11       | A330             | EMB-190/-195        |       |          |        |          | CV-880/-990 |
| 767     | MD-80/-90   | A340             |                     |       |          |        |          | VC-10       |
| 777     |             | A380             |                     |       |          |        |          |             |
| 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](http://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

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**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

- The airplane sustains substantial damage.
- The airplane is missing or is completely inaccessible.
- Death or serious injury results from
  - Being in the airplane.
  - Direct contact with the airplane or anything attached thereto.
  - Direct exposure to jet blast.

## 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, normal maneuvering, loose objects, boarding, disembarking, evacuation, and maintenance and servicing.
- Nonfatal injuries to persons not aboard the airplane.

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.
- 2) This publication excludes events that result in nonfatal injuries from atmospheric turbulence, normal 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

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

Note 2: External fatalities include on-ground fatalities as well as fatalities on other aircraft involved.

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

- The airplane was destroyed.
- There were multiple fatalities.
- 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 that is sustained by a person in an accident and that

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

Note: This is generally consistent with the ICAO definition. It is also consistent with the NTSB definition except for the last bullet item, which is not included in the NTSB definition.

# Definitions

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**Substantial Damage:** Damage or failure that adversely affects the structural strength, performance, or flight characteristics of the airplane, and that 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 definition is generally consistent with the NTSB definition of substantial damage except it (1) deletes reference to “small puncture holes in the skin or fabric” and “ground damage to rotor or propeller blades,” and (2) 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 damage or structural failure contained within part (b) of the ICAO accident definition.

Note 3: Boeing does not consider damage to be substantial if repairs to an event airplane enable it to be flown to a repair base within 48 hours of the event.

# Boeing Terms

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

**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 because 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.
- The search for the wreckage has been terminated without the airplane being located.
- The airplane is completely inaccessible.

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

# Exclusions

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**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, normal 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

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

## **Accident**

ICAO defines an “accident” as follows:

*Accident.* An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, 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 a single engine, (including its cowlings or accessories), to propellers, wingtips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome).

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. For purposes of this part, the definition of “aircraft accident” includes “unmanned aircraft accident,” as defined in 49 C.F.R. 830.2.

# Referenced ICAO and NTSB Definitions

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## **Serious Injury**

ICAO defines “serious injury” as follows:

*Serious Injury.* An injury that 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 that 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 that

- 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:

*Substantial damage* means damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which 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” for the purpose of this part.

ICAO does not define the term “substantial damage.”

# 2013 Airplane Accidents

## All Accidents | Worldwide Commercial Jet Fleet

| Event Date | Airline                  | Model (Age in Years) | Type of Operation | Accident Location      | Phase of Flight | Event Description   | Damage Category | Hull Loss | Injury Category | Onboard Fatalities/ Occupants (External Fatalities) | Major Accident |
|------------|--------------------------|----------------------|-------------------|------------------------|-----------------|---|-----------------|-----------|-----------------|---|----------------|
| 25-Jan-13  | FedEx                    | MD-11-F (16)         | Sched Cargo       | Denver, USA            | Landing         | The airplane sustained damage due to a tail strike during landing. There were no injuries.  | Substantial     |           |                 |   |                |
| 04-Feb-13  | Asiana Airlines          | 767-300F (16)        | Sched Cargo       | Incheon, South Korea   | Takeoff         | During acceleration to takeoff power, both engines shut down due to ice/snow ingestion. Both engines sustained damage. There were no injuries.  | Substantial     |           |                 |   |                |
| 06-Feb-13  | Tunisair                 | A320 (22)            | Sched Pax         | Tunis, Tunisia         | Landing         | The airplane sustained damage when it veered off the runway while landing. The nose gear collapsed. There were no injuries.   | Substantial     | X         |                 |   |                |
| 11-Feb-13  | Pakistan Int'l Airlines  | 737-300 (20)         | Sched Pax         | Muscat, Oman           | Landing         | The airplane sustained damage after landing when the left main landing gear collapsed during rollout. There were no injuries.   | Substantial     | X         |                 |   |                |
| 29-Mar-13  | Air Méditerranée         | A321 (16)            | Sched Pax         | Lyon, France           | Landing         | The airplane sustained damage when it overran the end of the runway and came to rest in soft ground. Both engines ingested rocks and mud. There were no injuries.   | Substantial     |           |                 |   |                |
| 05-Apr-13  | US Airways               | A321 (1)             | Sched Pax         | Las Vegas, USA         | Landing         | The airplane sustained damage due to a tail strike during landing. There were no injuries.  | Substantial     |           |                 |   |                |
| 13-Apr-13  | Lion Air                 | 737-800 (0)          | Sched Pax         | Denpasar, Indonesia    | Approach        | The airplane landed in the water short of the runway during a non-precision approach.   | Destroyed       | X         | Serious         |   | X              |
| 16-Apr-13  | Aeromexico               | 767-200 (23)         | Sched Pax         | Madrid, Spain          | Takeoff         | The airplane sustained a tail strike during takeoff. The cabin did not pressurize, oxygen masks deployed automatically, and the airplane performed an air turnback. There were no injuries.   | Substantial     | X         |                 |   |                |
| 16-Apr-13  | Asiana Airlines          | A321 (9)             | Sched Pax         | Seoul, South Korea     | Landing         | The airplane sustained damage due to a tail strike during landing. There were no injuries.  | Substantial     |           |                 |   |                |
| 29-Apr-13  | National Air Cargo Group | 747-400 (20)         | Sched Cargo       | Bagram, Afghanistan    | Initial Climb   | Shortly after takeoff, the airplane pitched up significantly and control of the airplane was lost. An uncontrolled ground impact and post-impact fire ensued.   | Destroyed       | X         | Fatal           | 7/7(0)  | X              |
| 24-May-13  | Air Via                  | A320 (1)             | Sched Pax         | Varna, Bulgaria        | Landing         | The airplane sustained damage during landing when it overran the end of the runway and came to rest in soft ground. Injuries were sustained during evacuation.  | Substantial     |           | Serious         |   |                |
| 24-May-13  | British Airways          | A319 (12)            | Sched Pax         | London, United Kingdom | Initial Climb   | During or shortly after takeoff rotation, the fan cowl doors from both engines departed, damaging the airframe and some aircraft systems. The flight crew elected to turn back. During approach, a fire developed on the right engine. A successful landing ensued. There were no injuries. | Substantial     |           |                 |   |                |

# 2013 Airplane Accidents

## All Accidents | Worldwide Commercial Jet Fleet

| Event Date | Airline              | Model (Age in Years) | Type of Operation | Accident Location            | Phase of Flight | Event Description  | Damage Category | Hull Loss | Injury Category | Onboard Fatalities/ Occupants (External Fatalities) | Major Accident |
|------------|----------------------|----------------------|-------------------|------------------------------|-----------------|--|-----------------|-----------|-----------------|---|----------------|
| 02-Jun-13  | Cebu Pacific Air     | A320 (2)             | Sched Pax         | Davao, Philippines           | Landing         | The airplane sustained damage during landing when it veered off the runway and the nose gear collapsed. There were no injuries.  | Substantial     |           |                 |   |                |
| 08-Jun-13  | Wizz Air             | A320 (1)             | Sched Pax         | Rome, Italy                  | Landing         | The airplane sustained damage during landing after the left main landing gear did not extend when commanded. There were injuries sustained during the emergency evacuation.  | Substantial     |           |                 |   |                |
| 02-Jul-13  | SriLankan Airlines   | A340 (19)            | Sched Pax         | Colombo, Sri Lanka           | Landing         | The airplane sustained damage resulting from a tail strike during a hard landing. There were no injuries.  | Substantial     |           |                 |   |                |
| 06-Jul-13  | Asiana Airlines      | 777-200 (7)          | Sched Pax         | San Francisco, USA           | Approach        | The airplane landed short of the runway, impacting a seawall. The aft portion of the airplane separated. There was a post-impact fire.   | Destroyed       | X         | Fatal           | 3/307(0)  | X              |
| 22-Jul-13  | Southwest Airlines   | 737-700 (14)         | Sched Pax         | New York, USA                | Landing         | The airplane sustained damage when it touched down nose landing gear first, causing the nose landing gear to collapse aft into the main equipment center. Minor injuries were sustained during evacuation.   | Substantial     | X         |                 |   |                |
| 31-Jul-13  | Orient Thai Airlines | 737-300 (27)         | Sched Pax         | Surat Thani, Thailand        | Landing         | During a missed approach, the airplane hit trees, but remained flying. A right engine shutdown followed. After diversion to another airport, the aircraft landed long, and ran off the end of the runway. The aircraft sustained substantial damage. There were no injuries. | Substantial     |           |                 |   |                |
| 06-Aug-13  | Ural Airlines        | A320 (7)             | Sched Pax         | Karlovy Vary, Czech Republic | Load/ Unload    | While preparing for departure, a ground worker delivering final paperwork to the flight deck fell from the entry door, receiving serious injuries.   | None            |           | Serious         |   |                |
| 12-Aug-13  | easyJet              | A320 (4)             | Sched Pax         | Milan, Italy                 | Initial Climb   | During initial climb, the fan cowl doors departed the left engine. The fuselage and empennage were damaged. The crew performed an air turnback to an uneventful landing. There were no injuries.   | Substantial     |           |                 |   |                |
| 14-Aug-13  | UPS                  | A300-600 (10)        | Sched Cargo       | Birmingham, USA              | Approach        | During approach, the airplane contacted trees and impacted a hillside short of the runway. A post-crash fire ensued.   | Destroyed       | X         | Fatal           | 2/2(0)  | X              |
| 08-Sep-13  | Thai Airways         | A330 (18)            | Sched Pax         | Bangkok, Thailand            | Landing         | The airplane sustained damage during landing when it veered off the runway. There were injuries sustained during the emergency evacuation.   | Substantial     |           | Serious         |   |                |
| 27-Sep-13  | EAX                  | 747-400 (21)         | Sched Pax         | Nouakchott, Mauritania       | Taxi            | The airplane sustained damage while taxiing for takeoff when the right wing contacted a light pole. There were no injuries.  | Substantial     |           |                 |   |                |
| 29-Sep-13  | Alitalia             | A320 (3)             | Sched Pax         | Rome, Italy                  | Approach        | The airplane sustained damage during landing after the right main landing gear did not extend when commanded. There were no injuries.  | Substantial     |           |                 |   |                |

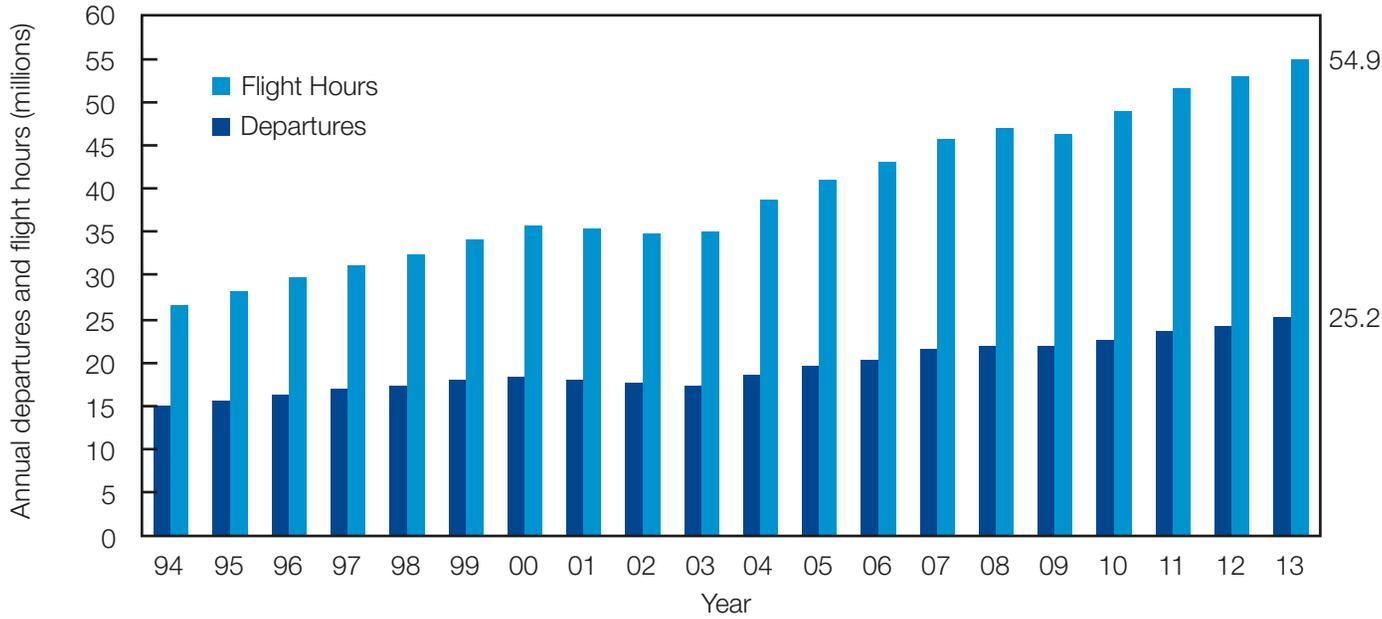
# 2013 Airplane Accidents

## All Accidents | Worldwide Commercial Jet Fleet

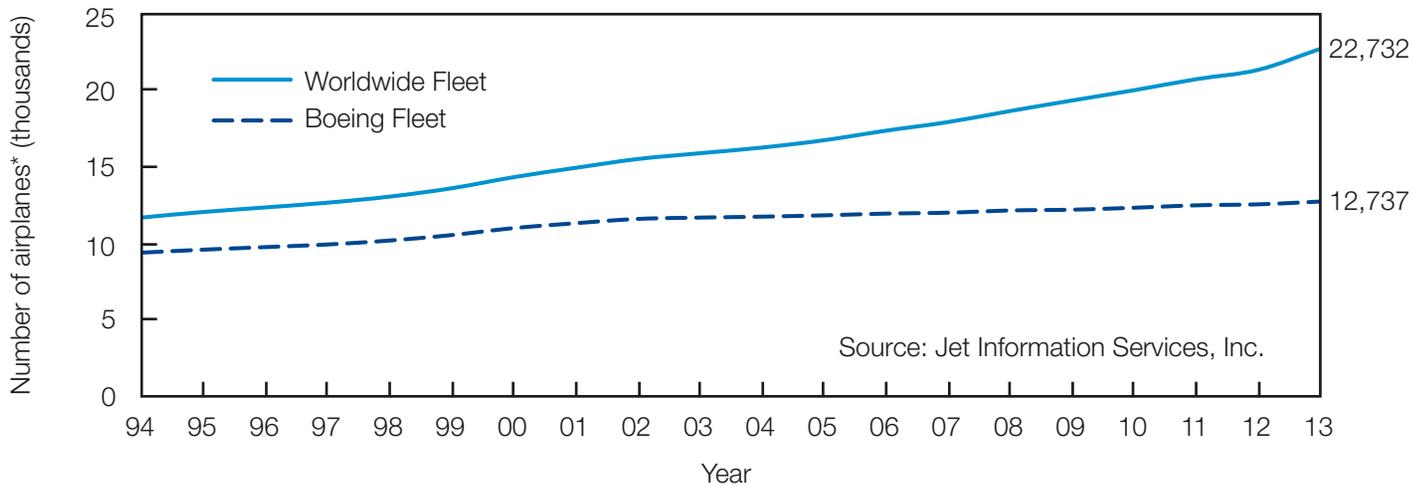
| Event Date | Airline                  | Model (Age in Years) | Type of Operation | Accident Location          | Phase of Flight | Event Description  | Damage Category | Hull Loss | Injury Category | Onboard Fatalities/ Occupants (External Fatalities) | Major Accident |
|------------|--------------------------|----------------------|-------------------|----------------------------|-----------------|--|-----------------|-----------|-----------------|---|----------------|
| 18-Oct-13  | Jordan Aviation          | A310 (25)            | Sched Pax         | Khartoum, Sudan            | Approach        | During approach, the airplane impacted two large birds. One bird penetrated the radome and damaged the forward pressure bulkhead. The second bird damaged the right engine inlet cowl. There were no injuries. | Substantial     | X         |                 |   |                |
| 19-Oct-13  | Skyjet Airlines          | BAe 146-200 (29)     | Charter Pax       | Manila, Philippines        | Landing         | The airplane sustained damage when it overran the end of the runway onto a beach. It was then submerged in water when the tide came in. There were no injuries.  | Substantial     | X         |                 |   |                |
| 17-Nov-13  | Aircompany Tatarstan     | 737-500 (23)         | Sched Pax         | Kazan, Russia              | Approach        | During a go-around, control of the airplane was lost and it impacted the ground in a steep nose-down attitude near the runway.   | Destroyed       | X         | Fatal           | 50/50(0)  | X              |
| 24-Nov-13  | Lufthansa Cargo          | MD-11-F (15)         | Sched Cargo       | São Paulo, Brazil          | Landing         | The airplane sustained damage due to a tail strike during landing. There were no injuries.   | Substantial     |           |                 |   |                |
| 04-Dec-13  | Aerospace Consortium FZE | 747-200B (27)        | Sched Cargo       | Abuja, Nigeria             | Landing         | During landing, the airplane veered off the right side of the runway and impacted construction equipment. A small fire was extinguished by the airport fire department. There were no injuries.                | Substantial     | X         |                 |   |                |
| 19-Dec-13  | Nova Airways             | 737-500 (16)         | Sched Pax         | Juba, Sudan                | Landing         | During rollout after landing, the airplane sustained damage when the nose landing gear collapsed. There were no injuries.  | Substantial     |           |                 |   |                |
| 22-Dec-13  | British Airways          | 747-400 (24)         | Sched Pax         | Johannesburg, South Africa | Taxi            | The airplane sustained damage to the right wing when it taxied onto the wrong taxiway and contacted a building. Three people in the building received minor injuries.  | Substantial     | X         |                 |   |                |
| 31         | Total Accidents          |                      |                   |                            |                 |  |                 | 13        |                 | 62 Onboard (0 External)                             | 5              |

# Departures, Flight Hours, and Jet Airplanes in Service\*

Worldwide Operations | 1994 through 2013



- 660 million departures since 1959 (482 million on Boeing airplanes)
- 1,204 million flight hours since 1959 (885 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

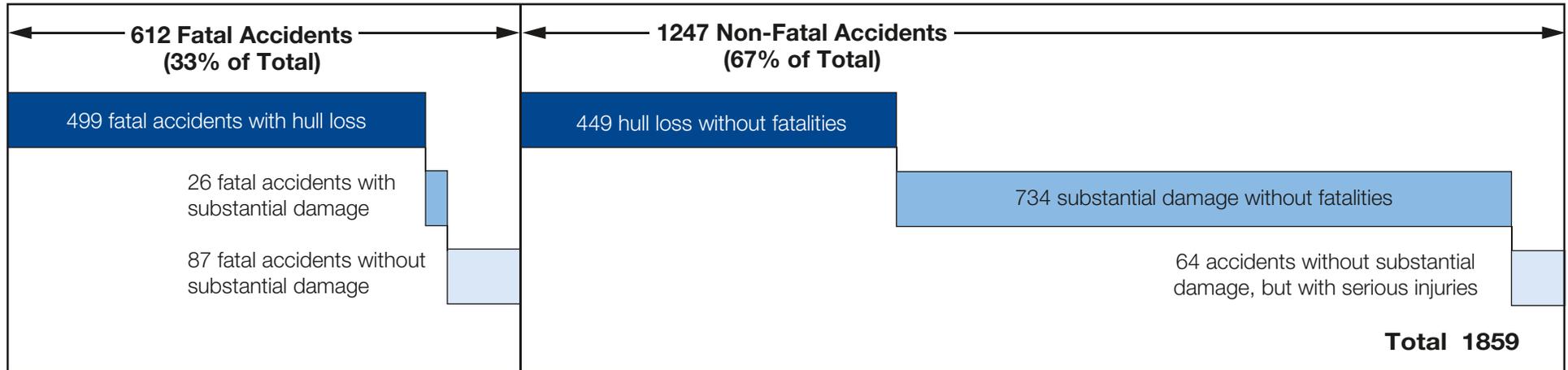
| Type of Operation  | All Accidents |            | Fatal Accidents |           | Onboard Fatalities<br>(External Fatalities)* |                              | Hull Loss Accidents |            |
|--|---------------|------------|-----------------|-----------|--|------------------------------|---------------------|------------|
|  | 1959-2013     | 2004-2013  | 1959-2013       | 2004-2013 | 1959-2013                                    | 2004-2013                    | 1959-2013           | 2004-2013  |
| Passenger  | 1,476         | 326        | 489             | 55        | 28,887<br>(790)                              | 3,783<br>(123)               | 698                 | 120        |
| ■ <i>Scheduled</i>   | 1,356         | 301        | 443             | 52        | 24,761                                       | 3,767                        | 628                 | 113        |
| ■ <i>Charter</i>   | 120           | 25         | 46              | 3         | 4,126  | 16                           | 70                  | 7          |
| Cargo  | 260           | 70         | 79              | 14        | 273<br>(342)                                 | 48<br>(15)                   | 175                 | 42         |
| Maintenance test, ferry, positioning, training,<br>and demonstration | 123           | 11         | 44              | 3         | 208<br>(66)                                  | 17<br>(0)                    | 75                  | 7          |
| <b>Totals</b>  | <b>1,859</b>  | <b>407</b> | <b>612</b>      | <b>72</b> | <b>29,368</b><br><b>(1,198)</b>              | <b>3,848</b><br><b>(138)</b> | <b>948</b>          | <b>169</b> |
| U.S. and Canadian Operators  | 562           | 76         | 182             | 12        | 6,202<br>(381)                               | 26<br>(7)                    | 226                 | 25         |
| Rest of the World  | 1,297         | 331        | 430             | 60        | 23,166<br>(817)                              | 3,822<br>(131)               | 722                 | 144        |
| <b>Totals</b>  | <b>1,859</b>  | <b>407</b> | <b>612</b>      | <b>72</b> | <b>29,368</b><br><b>(1,198)</b>              | <b>3,848</b><br><b>(138)</b> | <b>948</b>          | <b>169</b> |

\* External fatalities include on-ground fatalities as well as fatalities on the other aircraft involved.

# Accident Summary by Injury and Damage

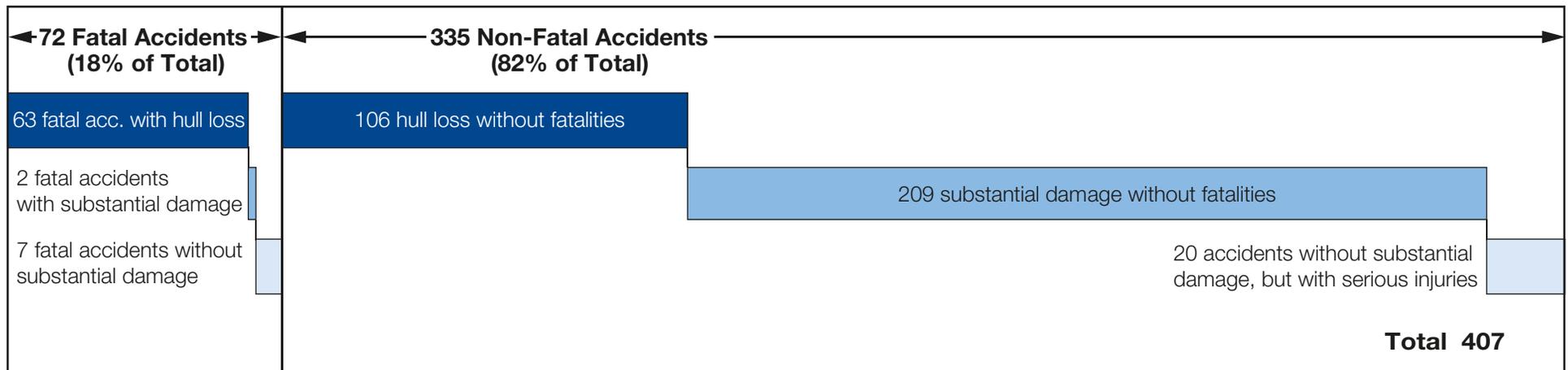
All Accidents | Worldwide Commercial Jet Fleet

## 1959 Through 2013



Number of Accidents

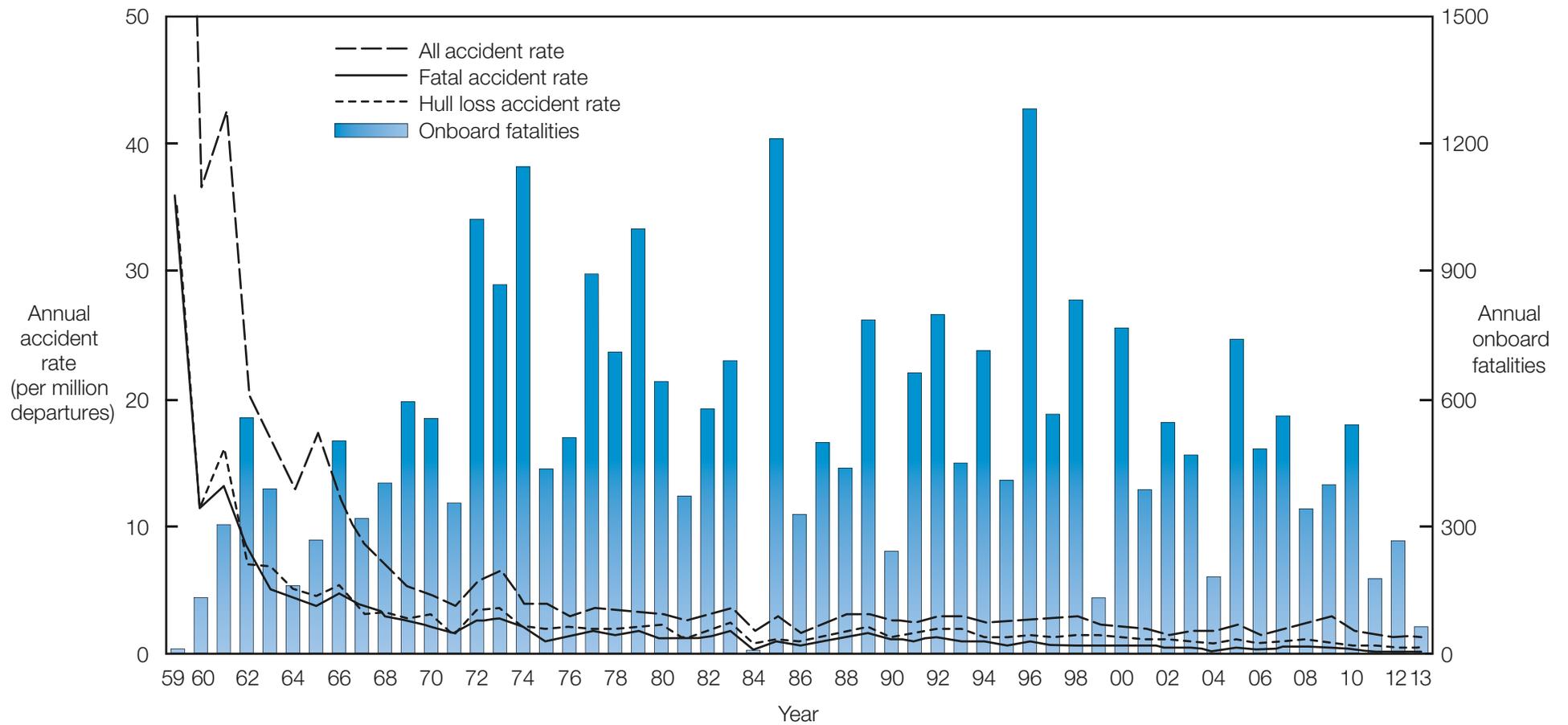
## 2004 Through 2013



Number of Accidents

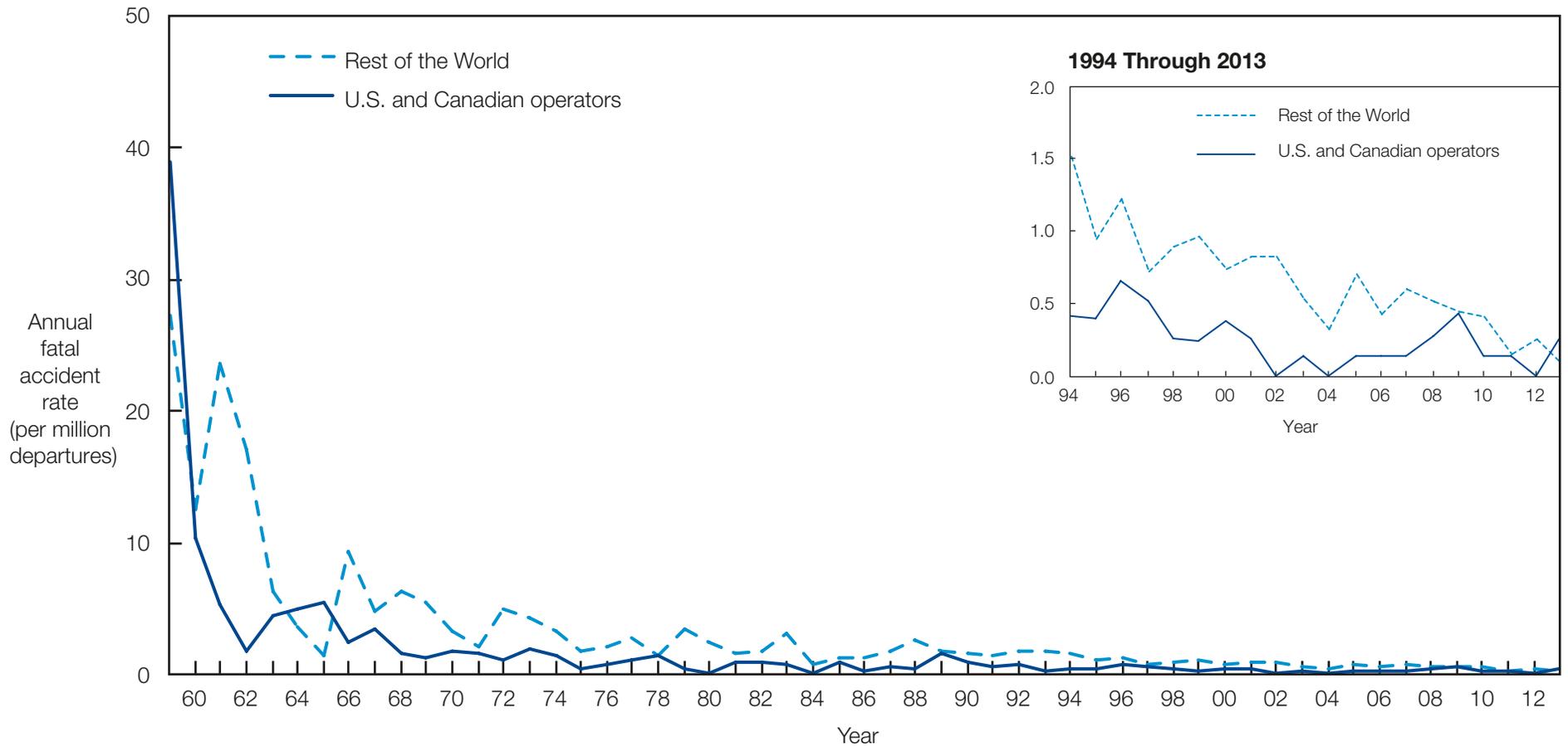
# Accident Rates and Onboard Fatalities by Year

Worldwide Commercial Jet Fleet | 1959 through 2013



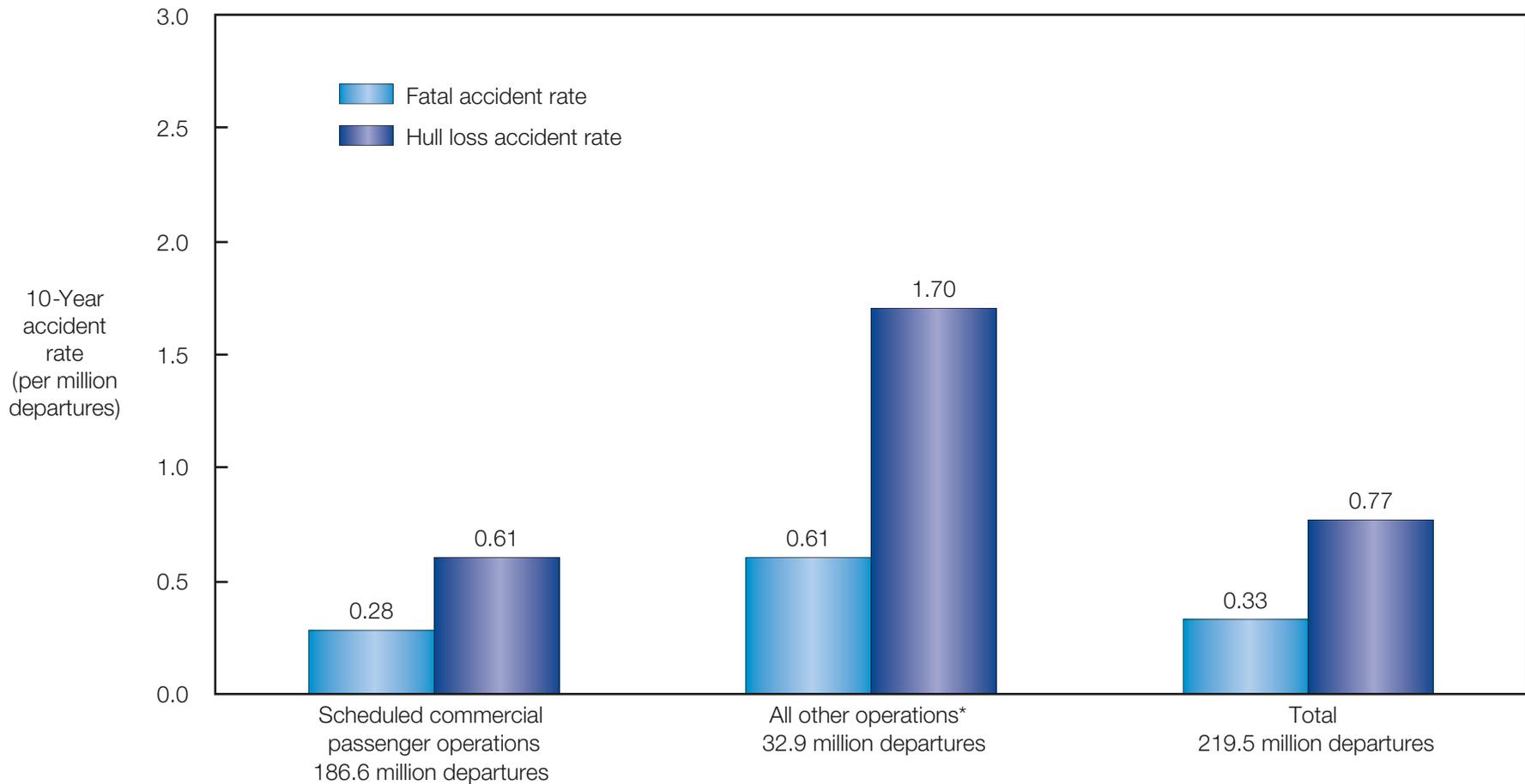
# U.S. and Canadian Operators Accident Rates by Year

Fatal Accidents | Worldwide Commercial Jet Fleet | 1959 through 2013



# 10-Year Accident Rates by Type of Operation

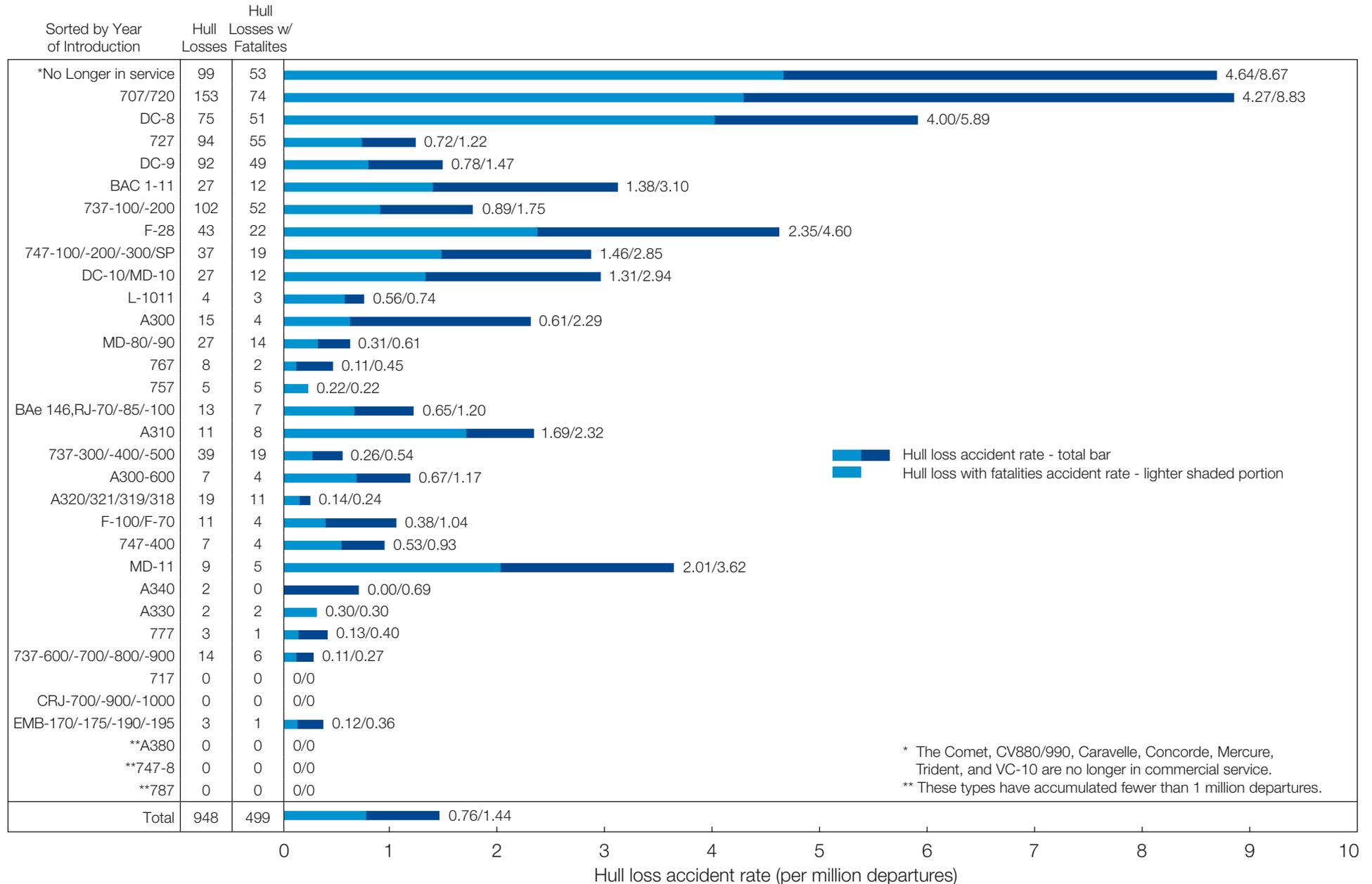
Fatal and Hull Loss Accidents Worldwide Commercial Jet Fleet | 2004 through 2013



\*Charter passenger, charter cargo, scheduled cargo, maintenance test, ferry, positioning, training, and demonstration flights

# Accident Rates by Airplane Type

Hull Loss Accidents | Worldwide Commercial Jet Fleet | 1959 through 2013

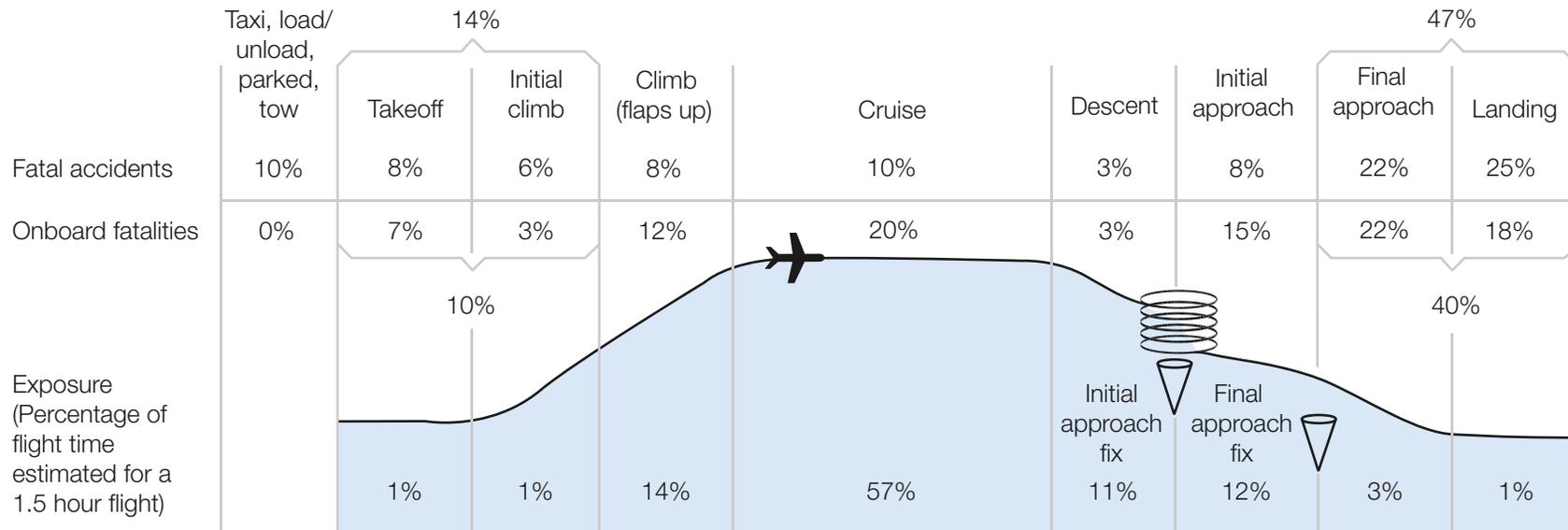


\* The Comet, CV880/990, Caravelle, Concorde, Mercure, Trident, and VC-10 are no longer in commercial service.  
 \*\* These types have accumulated fewer than 1 million departures.

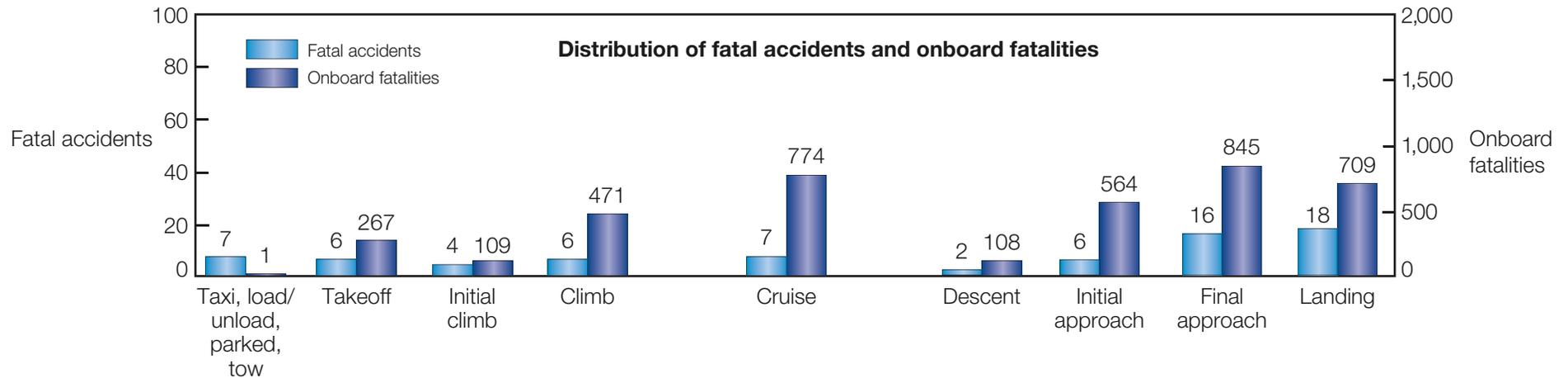
# Fatal Accidents and Onboard Fatalities by Phase of Flight

Worldwide Commercial Jet Fleet | 2004 through 2013

Percentage of fatal accidents and onboard fatalities



Note: Percentages may not sum precisely due to numerical rounding.



# CAST/ICAO Common Taxonomy Team (CICTT)

## Aviation Occurrence Categories

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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 one representative each 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.

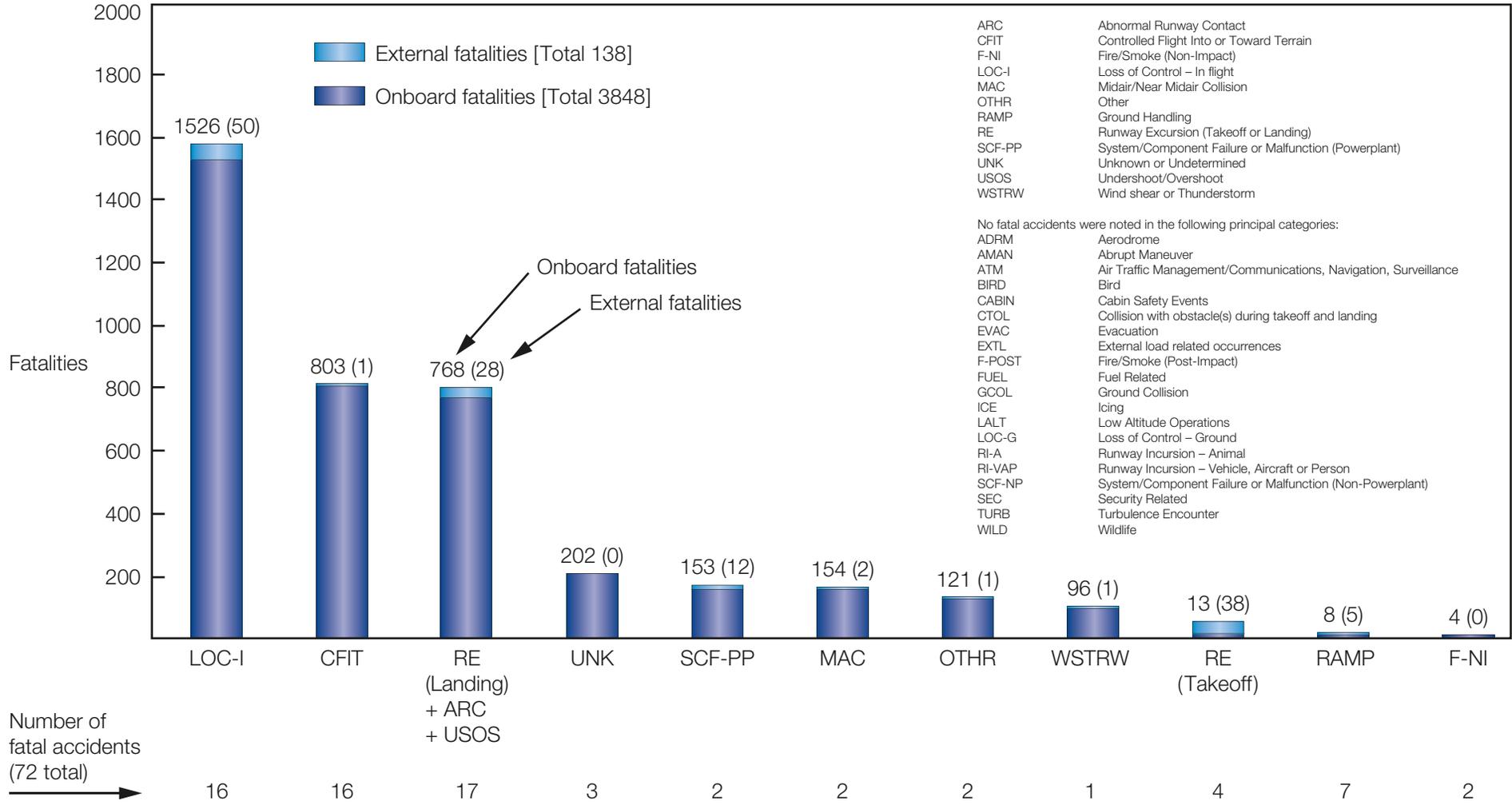
In a separate activity, the CAST assigned each fatal accident to a single principal category. Those accident assignments and a brief description of the categories are reported in the following chart.

The CAST use of principal categories has been instrumental in focusing industry and government efforts and resources on accident prevention. 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 CICTT Aviation Occurrence Categories

Fatal Accidents | Worldwide Commercial Jet Fleet | 2004 through 2013



- ARC Abnormal Runway Contact
  - CFIT Controlled Flight Into or Toward Terrain
  - F-NI Fire/Smoke (Non-Impact)
  - LOC-I Loss of Control - In flight
  - MAC Midair/Near Midair Collision
  - OTHR Other
  - RAMP Ground Handling
  - RE Runway Excursion (Takeoff or Landing)
  - SCF-PP System/Component Failure or Malfunction (Powerplant)
  - UNK Unknown or Undetermined
  - USOS Undershoot/Overshoot
  - WSTRW Wind shear or Thunderstorm
- No fatal accidents were noted in the following principal categories:
- ADRM Aerodrome
  - AMAN Abrupt Maneuver
  - ATM Air Traffic Management/Communications, Navigation, Surveillance
  - BIRD Bird
  - CABIN Cabin Safety Events
  - CTOL Collision with obstacle(s) during takeoff and landing
  - EVAC Evacuation
  - EXTL External load related occurrences
  - F-POST Fire/Smoke (Post-Impact)
  - FUEL Fuel Related
  - GCOL Ground Collision
  - ICE Icing
  - LALT Low Altitude Operations
  - LOC-G Loss of Control - Ground
  - RI-A Runway Incursion - Animal
  - RI-VAP Runway Incursion - Vehicle, Aircraft or Person
  - SCF-NP System/Component Failure or Malfunction (Non-Powerplant)
  - SEC Security Related
  - TURB Turbulence Encounter
  - WILD Wildlife

Note: Principal categories as assigned by CAST.

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

# Notes

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# Notes

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