More Accidents, Fewer Fatalities

Runway excursions were prominent in 2008 commercial jet accidents worldwide.

BY RICK DARBY

Runway excursions, the focus of the FSF Runway Safety Initiative and the *Runway Excursion Risk Reduction Toolkit* (p. 12), were prominent among worldwide commercial aviation accidents in 2008, according to the latest data from Boeing Commercial Airplanes.[1,2] Initial approach, final approach and landing continued to be the most accident-prone phases of flight.

Boeing's data include accidents involving commercial jet airplanes heavier than 60,000 lb (27,216 kg) maximum gross weight, and exclude types manufactured in the Russian Federation or the Soviet Union. Limited data are presented for the most recent year, 2008, but more extensive data are supplied for trailing periods beginning in 1999 and 1959. The second period covers roughly the entire commercial jet transport era.

There were 283 accidents involving passenger airplanes in the world commercial jet fleet in 1999–2008 (Table 1). That compared with 286 in 1998–2007 and 285 in 1997–2006. Fatal accidents — 76 in the most recent 10-year period — represented an improvement for this type of operation over 1998–2007, when there were 78. But they exceeded the 75 in 1997–2006.

There was little change in accident numbers in any category compared with the 1998–2007 period, but the number of on-board fatalities in all passenger operations decreased from 5,105 to 4,670, a 9 percent reduction. The improvement was more pronounced in charter operations, from 57 in 1998–2007 to four in 1999–2008, a 93 percent reduction. On-board cargo flight fatalities were down 12 percent, from 42 to 37.

The 2008 accident total for all types of operations was 53, compared with 2007's 38, but last year's accidents resulted in 356 on-board fatalities (Table 2, p. 50) versus 576 in 2007. In 2006, there were 28 accidents and 498 on-board fatalities. Although the summary did not offer a breakdown of accidents by country of registry, a letter accompanying the publication said, "U.S. airlines had one on-board fatality in 2008, compared to their average of 44 on-board fatalities per year for the preceding 10-year period."

Of the 53 accidents, 16 — 30 percent — were runway excursions. Three of the

Accidents, Worldwide Commercial Jet Fleet, by Type of Operation

Type of operation	All Accidents		Fatal Accidents		On-board Fatalities (External Fatalities)*	
	1959–2008	1999–2008	1959–2008	1999–2008	1959–2008	1999–2008
Passenger	1,287	283	471	76	27,443 (776)	4,670 (175)
Scheduled	1,184	265	426	74	23,330	4,666
Charter	103	18	45	3	4,113	4
Cargo	231	79	69	13	238 (329)	37 (78)
Maintenance test, ferry, positioning, training and demonstration	112	8	42	2	196 (66)	10 (0)
Totals	**1,630**	**370**	**582**	**91**	**27,877 (1,171)**	**4,717 (253)**
U.S. and Canadian operators	513	73	174	14	6,154 (448)	366 (83)
Rest of the world	1,117	297	408	77	21,723 (723)	4,351 (170)
Totals	**1,630**	**370**	**582**	**91**	**27,877 (1,171)**	**4,717 (253)**

*External fatalities include ground fatalities and fatalities on other aircraft involved, such as helicopters or small general aviation airplanes, that are excluded.

Source: Boeing Commercial Airplanes

Table 1

2008 Airplane Accidents, Worldwide Jet Fleet

Date	Airline	Model	Accident Location	Phase of Flight	Description	Damage	Fatalities On-board (External)	Major Accident
Jan. 2	Iran Air	F-100	Tehran, Iran	Takeoff	Struck ground	Destroyed		●
Jan. 3	Atlas Blue	737-400	Deauville, France	Landing	Overrun	Substantial		
Jan. 8	Aigle Azur	A321	Algiers, Algeria	Landing	Hard landing, tail strike	Substantial		
Jan. 9	Blue Air	BAe 146	Bacau, Romania	Landing	Nose landing gear collapse	Substantial		
Jan. 15	Air France	A300-600	Paris	Landing	Veered off runway	Substantial		
Jan. 17	British Airways	777-200	London	Final approach	Landed short	Destroyed		●
Jan. 28	Merpati Nusantara Airlines	737-300	Merauke, Indonesia	Landing	Struck cow on landing roll	Substantial		
Feb. 1	Lloyd Aereo Boliviano	727-200	Near Trinidad, Bolivia	Final approach	After fuel exhaustion, landed in field	Destroyed		●
Feb. 2	Atlas Air	747-200	Lome, Togo	Climb	Cargo shifted, damaged aft pressure bulkhead	Substantial		
Feb. 7	Airlink QantasLink	717-200	Darwin, Australia	Landing	Hard landing	Substantial		
Feb. 25	Aeromexico	777-200	Mexico City	Taxi	Wing struck light pole	Substantial		
March 1	Dragonair	747-400	Manchester, England	Landing	Engines struck ground	Substantial		
March 10	Adam Air	737-400	Batam, Indonesia	Landing	Landing gear collapsed, veered off runway	Substantial		
March 10	Saudi Arabian Airlines	777-200	Near Riyadh, Saudi Arabia	Final approach	Landing gear failure	—		
March 14	Air Algerie	737-800	Setif, Algeria	Landing	Hard landing	Substantial		
March 24	Aerosvit Airlines	737-200	St. Petersburg, Russia	Taxi	Struck tug	Substantial		
March 25	Saudi Arabian Airlines	747-300	Dhaka, Bangladesh	Landing	Engine fire	Substantial		
April 15	Hewa Bora Airways	DC-9	Goma, Zaire	Takeoff	Overrun	Destroyed	3 (37)	●
April 22	Carpatair	BAe 146	Bucharest, Romania	Landing	Veered off runway	Substantial		
May 4	Airblue Limited	A321	Quetta, Pakistan	Landing	Tail strike	Substantial		
May 16	Asia Pacific Airlines	727-200	Pohnpei, Micronesia	Landing	Departed wet runway	Substantial		
May 24	Air Ivoire	A321	Cotonou, Benin	Landing	Hard landing	Substantial		
May 25	Kalitta Air	747-200	Brussels	Takeoff	Overrun	Destroyed		●
May 30	TACA International Airlines	A320	Tegucigalpa, Honduras	Landing	Overrun	Destroyed	3 (2)	●
June 6	Aerocondor	737-200	Near Pucallpa, Peru	Climb	Damaged horizontal stabilizer and elevator	Substantial		
June 10	Sudan Airways	A310	Khartoum, Sudan	Landing	Overrun	Destroyed	33	●
June 14	FedEx	DC-10	Near New York City	Descent	Airspeed loss, excessive-maneuver damage	Substantial		
June 18	Comair	737-200	Durban, South Africa	Landing	Veered off side of runway	Substantial		
June 19	China Eastern Airlines	A319	Near Changsha, China	Cruise	Cargo hold fire	Substantial		
June 28	ABX Air	767-200	San Francisco	Parked	Fire	Substantial		
July 2	Pakistan International Airlines	777-200	Near Milan, Italy	Descent	Severe hail damage	Substantial		
July 6	USA Jet Airlines	DC-9	Saltillo, Mexico	Final approach	Crashed and burned	Destroyed	1	●
July 7	Kalitta Air	747-200	Near Bogota, Colombia	Initial climb	Engine failure	Destroyed	(2)	●
July 14	Chanchangi Airlines	737-200	Port Harcourt, Nigeria	Landing	Overrun	Substantial		
July 25	Qantas	747-400	Near Manila, Philippines	Cruise	Depressurization	Substantial		
Aug. 5	Lufthansa	A320	Manchester, England	Taxi	Struck by taxiing airplane	Substantial		
Aug. 15	Jet2	737-300	Near Bergamo, Italy	Final approach	Hail storm damage	Substantial		
Aug. 20	Spanair	MD-82	Madrid	Takeoff	Crashed and burned	Destroyed	154	●
Aug. 24	ITEK AIR AirCompany	737-200	Near Bishkek, Kyrgyzstan	Final approach	Crashed and burned	Destroyed	64	●

Table 2

(continued next page)

2008 Airplane Accidents, Worldwide Jet Fleet

Date	Airline	Model	Accident Location	Phase of Flight	Description	Damage	Fatalities On-board (External)	Major Accident
Aug. 27	Sriwijaya Air	737-200	Jambi, Indonesia	Landing	Overrun	Substantial		
Aug. 30	CONVIASA	737-200	Near Latacunga, Ecuador	Descent	Crashed in mountainous terrain	Destroyed	3	●
Sept. 1	HeavyLift International Airlines	DC-8	El Fasher, Sudan	Landing	Hard landing	Substantial		
Sept. 14	Aeroflot-Nord	737-500	Near Perm, Russia	Initial approach	Crashed in darkness and poor weather	Destroyed	88	●
Sept. 22	ICARO	F-28	Quito, Ecuador	Takeoff	Overrun	Destroyed		●
Oct. 1	KD Avia	737-300	Kaliningrad, Russia	Landing	Gear-up landing	Substantial		
Oct. 7	Qantas	A330	Near Learmonth, Australia	Cruise	Autoflight-commanded pitch-down	—		
Oct. 16	Rutaca Airlines	737-200	Caracas, Venezuela	Landing	Veered off	Substantial		
Oct. 27	Cargo B Airlines	747-200	Brussels	Takeoff	Tail strike	Substantial		
Nov. 10	Ryanair	737-800	Rome	Final approach	Multiple bird strikes	Destroyed		●
Nov. 27	XL Airways Germany	A320	Near Perpignan, France	Initial approach	Broke up and struck sea	Destroyed	7	●
Dec. 15	Mesa Airlines	CRJ-700	Chicago	Landing	Left main landing gear retracted	Substantial		
Dec. 20	Continental Airlines	737-500	Denver	Takeoff	Veered off	Destroyed		●
Dec. 26	American Airlines	MD-83	Los Angeles	Taxi	Collision with tug	Substantial		
53 total accidents							**356 (41)**	**17**

Note: Airplanes manufactured in the Commonwealth of Independent States or the Soviet Union are excluded because of lack of operational data. Commercial airplanes used in military service are also excluded.

Source: Boeing Commercial Airplanes

Table 2

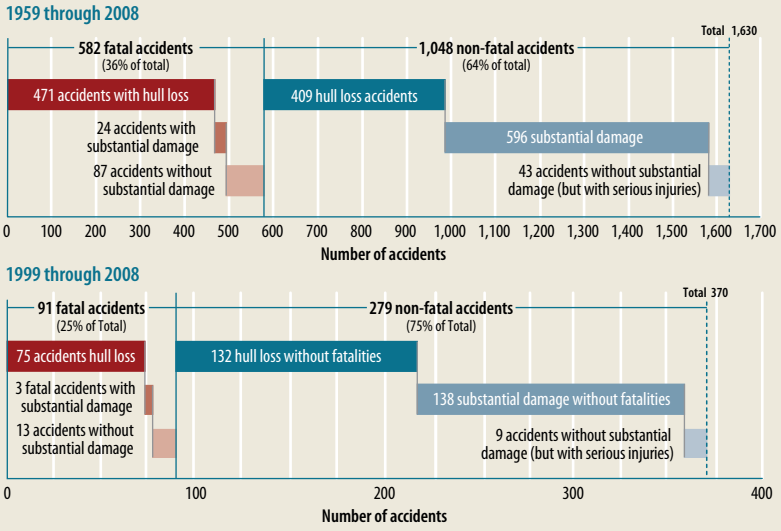
10 accidents with onboard fatalities, or 30 percent, were runway excursions. Six excursions were classified as major accidents, a category that partially overlaps the fatal accident category.[3]

Thirty-one accidents, 58 percent of the total, occurred in the initial approach, final approach or landing phase. The accidents included six fatal and six major accidents.

In the most recent 10-year period, fatal accidents accounted for 25 percent of the total (Figure 1). The fatal-accident proportion of all accidents was 36 percent for the 1959–2008 span. The number of fatal accidents without substantial airplane damage was 14 percent and 15 percent of the total of fatal accidents in the past 10 years and from 1959 onward, respectively.

Among nonfatal accidents, those involving substantial damage represented

Accidents, by Injury and Damage, Worldwide Commercial Jet Fleet



Note: Airplanes manufactured in the Commonwealth of Independent States or the Soviet Union are excluded because of lack of operational data. Commercial airplanes used in military service are also excluded.

Source: Boeing Commercial Airplanes

Figure 1

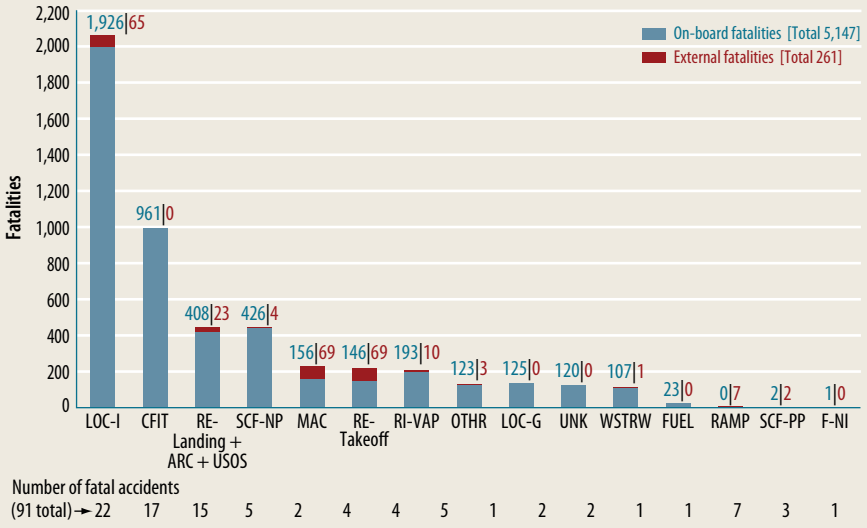
49 percent in 1999–2008 and 57 percent in 1959–2008. Thirteen fatal accidents in the most recent 10-year period, 14 percent of the fatal-accident total, were not accompanied by substantial damage. Nine nonfatal accidents with serious injuries, but no substantial damage, represented 3 percent of the nonfatal-accident total for this period.

For the 10 years ending in 2008, the fatal accident rate for scheduled commercial passenger operations worldwide was 0.45 per million departures. All other operations — charter passenger and cargo, scheduled cargo, maintenance test, ferry, positioning, training and demonstration flights — had a fatal accident rate of 0.63 per million departures.

Tabulating fatal accidents by the U.S. Commercial Aviation Safety Team (CAST)/International Civil Aviation Organization (ICAO) taxonomy, "loss of control in flight" was the dominant category in 2008 and the trailing nine years (Figure 2).[4] Loss of control accidents resulted in 1,926 on-board fatalities, more than double the 961 for "controlled flight into terrain" (CFIT). The difference widened since the 1998–2007 report, when the numbers were 1,984 and 1,137 respectively. The CFIT data for the 1998–2007 period were also an improvement on 1997–2006, when on-board CFIT fatalities totaled 1,655. It appears that industry efforts to reduce CFIT can claim a degree of success.

The number of on-board fatalities in the next-largest category for 1998–2007, "system/component failure or malfunction (non-powerplant)," was also reduced from 655 to 426 in the latest 10-year period.

Fatalities by CAST/ICAO Taxonomy Accident Category, Worldwide Commercial Jet Fleet, 1998–2007



CAST = U.S. Commercial Aviation Safety Team; ICAO = International Civil Aviation Organization; ARC = abnormal runway contact; CFIT = controlled flight into terrain; F-NI = fire/smoke (non-impact); FUEL = fuel related; LOC-G = loss of control – ground; LOC-I = loss of control – in flight; MAC = midair/near midair collision; OTHR = other; RAMP = ground handling; RE = runway excursion; RI-VAP = runway incursion – vehicle, aircraft or person; SCF-NP = system/component failure or malfunction (non-powerplant); SCF-PP = system/component failure or malfunction (powerplant); UNK = unknown or undetermined; USOS = undershoot/overshoot; WSTRW = wind shear or thunderstorm.

No accidents were noted in the following principal categories: aerodrome, abrupt maneuver, air traffic management/communications, navigation, surveillance, cabin safety events, evacuation, fire/smoke (post-impact), ground collision, icing, low altitude operations, runway incursion – animal, security related, turbulence encounter.

Note: Principal categories are as assigned by CAST. Airplanes manufactured in the Russian Federation or the Soviet Union are excluded because of lack of operational data. Commercial airplanes used in military service are also excluded.

Source: Boeing Commercial Airplanes

Figure 2

Notes

1. Boeing Commercial Airplanes. *Statistical Summary of Commercial Jet Airplane Accidents: Worldwide Operations 1959–2008.* Available via the Internet at <www.boeing.com/news/techissues>.
2. An airplane *accident* is defined as "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; direct contact with the airplane or anything attached thereto; or direct exposure to jet blast; the airplane sustains substantial damage; or the airplane is missing or completely inaccessible." Occurrences involving test flights or resulting from hostile action such as sabotage or hijacking are excluded.
3. Boeing defines a *major* accident as one 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. Flight Safety Foundation supports the use of this term to designate the most severe accident category, in place of the traditional term *hull loss*, which the Foundation believes is more significant for insurance actuarial purposes than as a measure of risk.

   Substantial damage is "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."
4. The taxonomy is described at <www.intlaviationstandards.org>.