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Runway Excursions a Continuing Threat

Safety gains in the excursion accident record were reversed in 2010.

Worldwide commercial jet aviation resulted in fewer accidents in 2010 than in 2009, according to data released by Boeing Commercial Airplanes.^{1,2} That was the best news in the year-over-year comparisons. However, on-board fatalities jumped from 413 in 2009 to 555 in 2010. The number of runway excursions — veer-offs and overruns — increased by one, and runway excursions as a percentage of all accidents were higher.

A total of 40 accidents occurred in 2010 (Table 1). That represented a 35 percent decrease from 62 the previous year and a 25 percent decrease from 53 in 2008. Eleven accidents were classified as “major” in 2010, compared with 13 in 2009.³

Nine of the 2010 accidents were fatal, including one that occurred while the aircraft was stopped on the runway; a passenger later died from injuries sustained during the evacuation.

Six of the eight in-flight fatal accidents in 2010 occurred during the approach and landing phases of flight,

compared with four of eight in 2009. The 26 approach and landing accidents accounted for 65 percent of the total accidents, compared with 60 percent in 2009 and 58 percent in 2008.

One of the 13 runway excursion accidents was fatal — the overrun at Mangalore, India, on May 22, which cost 158 lives (*ASW*, 5/11, p. 12). Excursion accidents represented 33 percent of total accidents, compared with 19 percent in 2009 and 30 percent in 2008.

A single accident — a fatal one — occurred during cruise flight in 2010. Seven accidents, of the total of 62, were in the cruise phase the prior year.

Changes from one year to the next can suggest possible trends but are subject to “confounding” factors; for example, the number of fatalities in an accident may be influenced by the number of passengers who happen to be on the flight. Boeing’s annual accident summaries provide longer timelines where the data comparisons are likely to be more meaningful,

principally differences in accidents since commercial jet aviation began in significant numbers in 1959, and during 10-year study periods.

Viewed in a wider time frame, some improvement is seen. In the 2001–2010 period, there were 4,707 on-board fatalities in scheduled passenger service, compared with 4,938 in 2000–2009, a decrease of 5 percent (Table 2, p. 56). The number of fatal accidents in scheduled passenger service dropped from 69 in 2000–2009 to 67 in the more recent 10-year span. There was one fewer charter operations fatal accident in 2001–2010 than in 2000–2009.

Cargo flights were involved in 15 fatal accidents in the most recent 10 years compared with 14 in the prior 10 years, resulting in 46 on-board fatalities compared with 42. The number of accidents in cargo operations was down in the latest 10-year span, from 81 to 80.

Considering all accidents in the worldwide commercial jet fleet, no change in recent trends appeared in the latest summary. Fatal accidents

2010 Airplane Accidents, Worldwide Jet Fleet

Date	Airline	Model	Accident Location	Phase of Flight	Description	Damage Category	Onboard Fatalities (External Fatalities)	Major Accident?
Jan. 2	Compagnie Africaine d'Aviation	727	Kinshasa, Congo D.R.	Landing	Runway veer-off	Destroyed		●
Jan. 15	Iran Air	F-100	Isfahan, Iran	Landing	Hard landing	Substantial		
Jan. 16	Utair	737-500	Moscow	Taxi	Nose landing gear collapse	Substantial		
Jan. 19	Mexicana Airlines	A318	Cancun, Mexico	Takeoff	Fan cowling torn off	Substantial		
Jan. 25	Ethiopian Airlines	737-800	Near Beirut, Lebanon	Climb	Struck Mediterranean Sea after takeoff	Destroyed	90 (0)	●
Jan. 30	Spring Airlines	A320	Shenyang, China	Landing	Tail strike	Substantial		
Feb. 6	SAS	MD-82	Grenoble, France	Landing	Tail strike	Substantial		
Feb. 11	Click Mexicana	F-100	Monterrey, Mexico	Landing	Runway veer-off	Substantial		
Feb. 13	Southwest Airlines	737-700	Near Santa Clarita, California, U.S.	Approach	TCAS avoidance maneuver injured flight attendant	Substantial		
March 1	ACT Airlines	A300-B4	Bagram, Afghanistan	Landing	Landing gear collapse	Substantial		
March 1	Air Tanzania	737-200	Mwanza, Tanzania	Landing	Runway veer-off	Substantial		
March 4	China Airlines	747-400	Anchorage, Alaska, U.S.	Takeoff	Tail strike	Substantial		
March 4	Cobham Aviation Australia	717	Ayers Rock, Australia	Parked	Flight attendant fell from airplane			
April 2	EgyptAir	A330	Cairo, Egypt	Taxi	Struck two light poles	Substantial		
April 2	Southwest Airlines	737-300	Los Angeles	Pushback	Struck baggage cart	Substantial		
April 13	Merpati Nusantara Airlines	737-300	Manokwari, Indonesia	Landing	Runway overrun	Destroyed		●
April 13	AeroUnion	A300-B4	Near Monterrey, Mexico	Approach	Struck ground	Destroyed	5 (1)	●
May 12	Afriqiyah Airways	A330	Near Tripoli, Libya	Approach	Struck ground	Destroyed	103 (0)	●
May 22	Air India Express	737-800	Mangalore, India	Landing	Runway overrun	Destroyed	158 (0)	●
June 5	US Airways	A321	Charlotte, North Carolina, U.S.	Parked	Struck by another taxiing airplane	Substantial		
June 6	Royal Air Maroc	737-400	Near Amsterdam, Netherlands	Initial climb	Bird strike	Substantial		
June 21	Hewa Bora Airways	MD-82	Kinshasa, Congo D.R.	Takeoff	Runway veer-off	Substantial		
July 27	Lufthansa Cargo	MD-11	Riyadh, Saudi Arabia	Landing	Runway veer-off	Destroyed		●
July 28	AirBlue	A321	Near Islamabad, Pakistan	Approach	Struck hillside	Destroyed	152 (0)	●
July 28	Mauritania Airways	737-700	Conakry, Guinea	Landing	Runway overrun	Substantial		
Aug. 12	Azerbaijan Airlines	A319	Istanbul, Turkey	Landing	Runway overrun	Substantial		
Aug. 16	Aires Colombia	737-700	San Andres Island, Colombia	Landing	Landing short	Destroyed	2 (0)	●
Aug. 20	Chanchangi Airlines	737-200	Kaduna, Nigeria	Landing	Landing short	Substantial		
Aug. 24	Henan Airlines	EMB-190	Yichun, China	Final approach	Landing short	Destroyed	42 (0)	●
Aug. 26	Iran Aseman Airlines	F-100	Tabriz, Iran	Landing	Runway overrun	Substantial		
Sept. 3	UPS	747-400	Near Dubai, United Arab Emirates	Cruise	In-flight fire	Destroyed	2 (0)	●
Sept. 6	easyJet	A320	London	Parked	Struck by truck	Substantial		
Sept. 24	Wind Jet	A319	Palermo, Italy	Landing	Runway veer-off	Substantial		
Sept. 25	Atlantic Southeast Airlines	CRJ-900	New York	Landing	Gear failed to extend	Substantial		
Oct. 3	Thomsonfly	767	Bristol, England	Landing	Hard landing	Substantial		
Oct. 31	Turkish Airlines	A310	Casablanca, Morocco	Landing	Runway veer-off	Substantial		
Nov. 2	Lion Air	737-400	Pontianak, Indonesia	Landing	Runway overrun	Substantial		
Nov. 4	Global Air	737-200	Puerto Vallarta, Mexico	Landing	Nose landing gear retracted	Substantial		
Nov. 4	Qantas Airways	A380	Near Batam Island, Indonesia	Climb	Uncontained engine failure	Substantial		
Nov. 10	Kuwait Airways	A300-600	Kuwait City	Parked	Evacuation	—	1 (0)	
Total accidents: 40						Totals	555 (1)	11

TCAS = traffic-alert and collision avoidance system

Source: Boeing Commercial Airplanes

Table 1

were reduced from 89 in 2000–2009 to 87 in 2001–2010. All accidents increased from 393 to 399, respectively.

In accidents from 2001 through 2010, 87, or 22 percent, were fatal (Figure 1). For 2000–2009, the equivalent figure was 23 percent; for

1999–2008 and 1998–2007, 25 percent each. From 1959 through 2010, 34 percent of accidents were fatal.

The most recent 10-year period included 180 substantial damage accidents with no fatalities, representing 45 percent of all accidents. Among

non-fatal accidents, 4.5 percent involved no substantial damage but serious injuries in 2001–2010. In the 1959–2010 stretch, the corresponding percentage was 4.9 percent.

For 1959 through 2010, 88 fatal accidents — 15 percent of fatal accidents — occurred in the absence of substantial damage. For 2001 through 2010, the percentage was the same.

Scheduled commercial passenger operations had a fatal accident rate of 0.40 per million departures in 2001–2010. All other operations, including categories such as charter passenger, charter cargo, maintenance test and training, had a fatal accident rate of 0.67 per million departures.

Boeing has adopted the practice of tabulating fatalities according to the standardized taxonomy of the U.S. Commercial Aviation Safety Team/ International Civil Aviation Organization

Accidents, Worldwide Commercial Jet Fleet, by Type of Operation

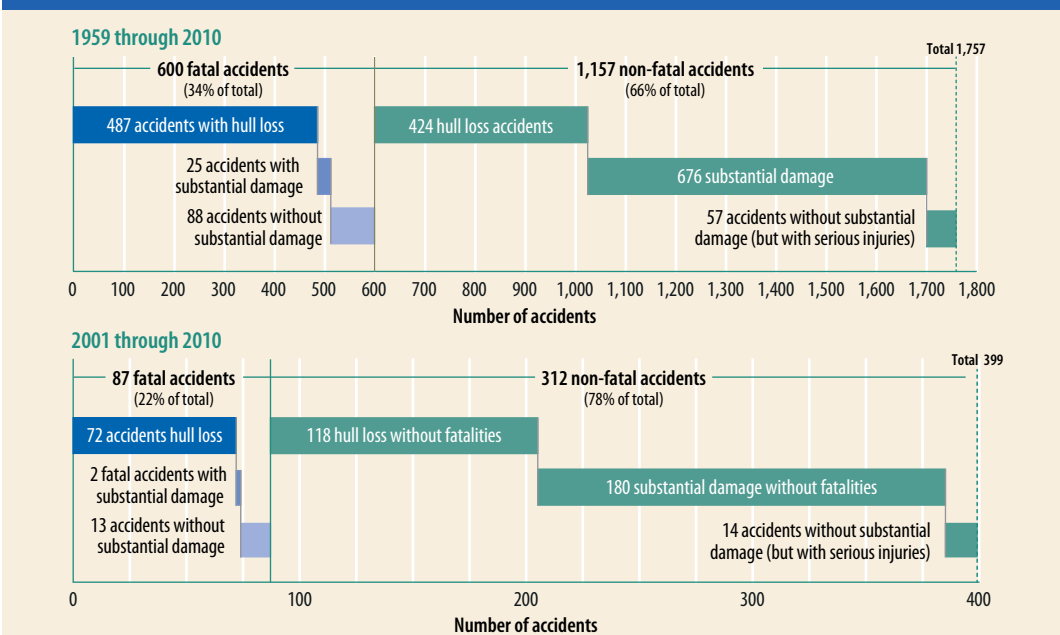
Type of operation	All Accidents		Fatal Accidents		On-board Fatalities (External Fatalities)*	
	1959–2010	2001–2010	1959–2010	2001–2010	1959–2010	2001–2010
Passenger	1,390	308	481	69	28,381 (777)	4,711 (157)
Scheduled	1,276	287	436	67	24,267	4,707
Charter	114	21	45	2	4,114	4
Cargo	250	80	75	15	262 (330)	46 (74)
Maintenance test, ferry, positioning, training and demonstration	117	11	44	3	208 (66)	17 (0)
Totals	1,757	399	600	87	28,851 (1,173)	4,774 (231)
U.S. and Canadian operators	541	75	178	12	6,158 (381)	265 (15)
Rest of the world	1,216	324	422	75	22,693 (792)	4,509 (216)
Totals	1,757	399	600	87	28,851 (1,173)	4,774 (231)

*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 2

Accidents, by Injury and Damage, Worldwide Commercial Jet Fleet



Source: Boeing Commercial Airplanes

Figure 1

(CAST/ICAO).⁴

For the most recent 10-year study period, “loss of control in flight” (LOC-I) and “controlled flight into terrain” (CFIT) were the categories with the greatest number of on-board fatalities (Figure 2). The LOC-I on-board fatalities, numbering 1,756, were almost unchanged from 2000–2009. The on-board loss of life from CFIT accidents, however, which totaled 961 in 2000–2009, was greater in the latest period at 1,007.

The third greatest number of on-board fatalities in 2001–2010 was amalgamated by Boeing as “runway excursion (RE) landing” combined with “abnormal runway contact” (ARC) and “undershoot/overshoot” (USOS). The on-board fatalities, 766, in the latest 10-year time frame were higher than those in the previous 10-year tally, 606. The equivalent number in 1999–2008 was 408.

There was no increase in on-board fatalities from runway excursions on takeoff between 2001–2010 and 2000–2009: 154 on-board fatalities, 38 external fatalities.

Notes

1. Boeing Commercial Airplanes. *Statistical Summary of Commercial Jet Airplane Accidents: Worldwide Operations 1959–2010*. June 2011. <www.boeing.com/news/techissues/pdf/statsum.pdf>.
2. The data are limited to commercial jet airplanes over 60,000 lb (27,216 kg) maximum gross weight.
3. Boeing defines a *major* accident as one meeting any of three conditions: the airplane was destroyed; there were multiple fatalities; or there was one fatality and the airplane was substantially damaged.
4. The taxonomy is described at <www.intlaviationstandards.org>.

Fatalities by CAST/ICAO Taxonomy Accident Category, Worldwide Commercial Jet Fleet, 2001–2010

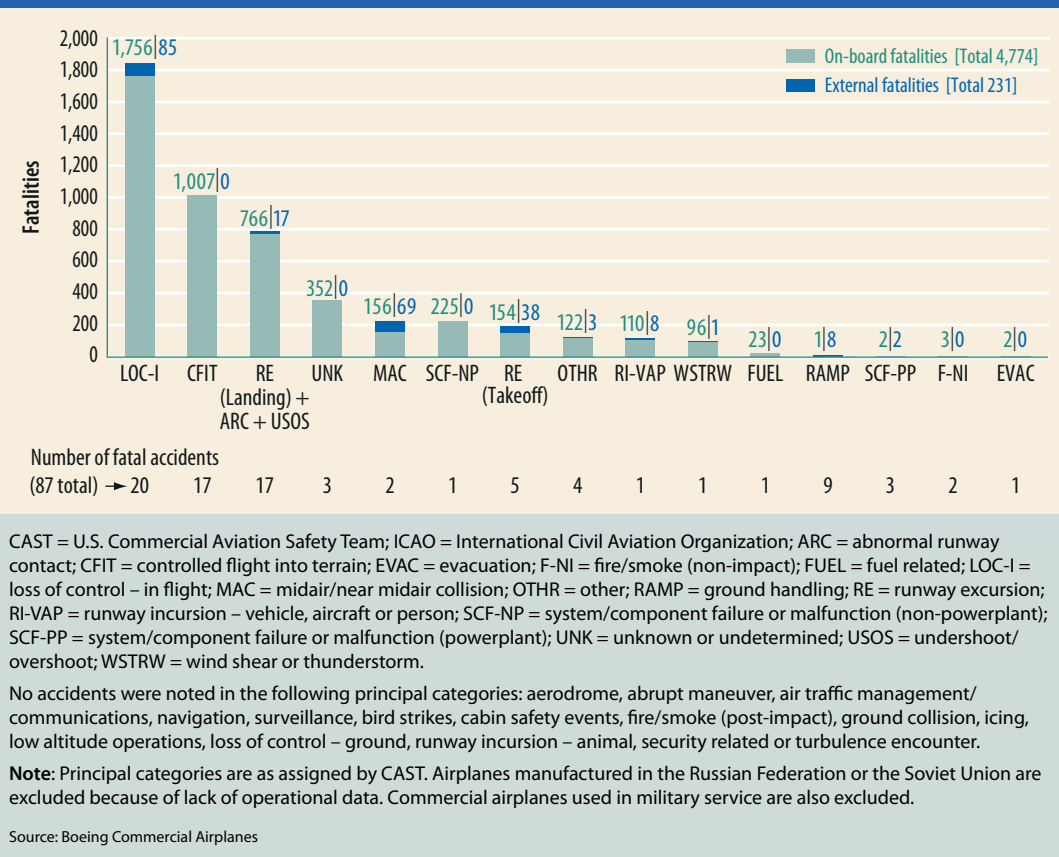


Figure 2

Airplanes manufactured in the Soviet Union or Commonwealth of Independent States are excluded because of the lack of operational data.

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 hostile action such as sabotage or hijacking are excluded.