

BY RICK DARBY

# IOSA Pays Off

Certification shows a risk management benefit in the latest IATA report.

The International Air Transport Association (IATA) Operational Safety Audit Program (IOSA), a certification requirement for all IATA member air carriers, continues to be a significant accident-rate differentiator. In 2010, IOSA-certified operators “had an accident rate 53 percent better than non-IOSA carriers,” according to IATA’s *Safety Report 2010*<sup>1</sup> (Figure 1).

The gap between IATA’s 230 member carriers — representing 93 percent of scheduled international air traffic — and the industry as a whole in terms of hull-loss accidents widened in 2010, compared with 2009 (Figure 2, p. 50).<sup>2</sup> “The [industry] accident rate was 0.61 Western-built jet hull losses per million sectors flown in 2010,” the report says. “IATA member airlines greatly surpassed the industry’s performance in terms of safety, with an accident rate of 0.25 Western-built hull losses per million sectors flown. This was the lowest rate ever recorded by IATA carriers.”

IOSA-certified carriers in 2010 “accomplished approximately 61 percent of all international and domestic passenger and cargo flights worldwide,” the organization says. In that year, among the 94 total accidents, 28 percent involved IATA members. In runway excursions, the most common type of accident, 21 percent involved IATA carriers, down from 26 percent in 2009 and 27 percent in 2008.

The total number of accidents — IATA and non-IATA, jet and turboprop — increased from 90 in 2009 to 94 in 2010. The number of fatal accidents increased year-over-year from 18 to

23. Fatalities totaled 786 in 2010, compared with 685 in 2009. The Western-built jet hull-loss rate decreased from 0.7 per million sectors flown in 2009 to 0.6 in 2010.

Runway excursions were responsible for 23 percent of the accident total in 2010 (Figure 3, p. 50). Ten percent of those involved fatalities. Runway excursions as a percent of the annual total have decreased from 27 percent in 2008. “IATA members reduced seven runway excursion accidents by 43 percent in two years, four in 2010 versus seven in 2008,” the report says.

“Aircraft technical faults and maintenance issues” was the second most frequent category

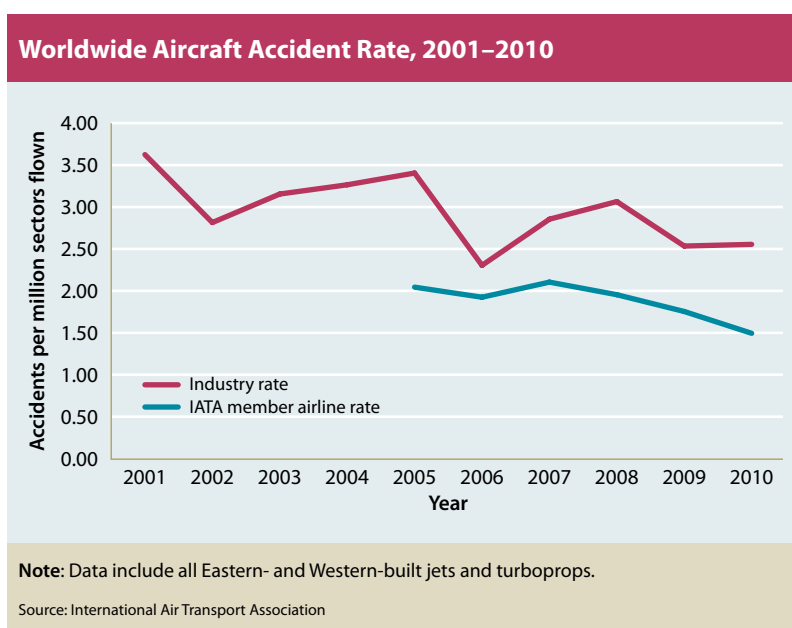
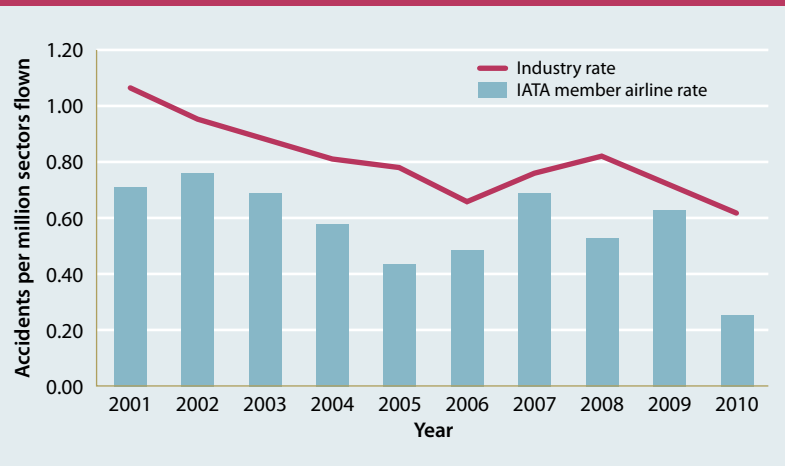


Figure 1

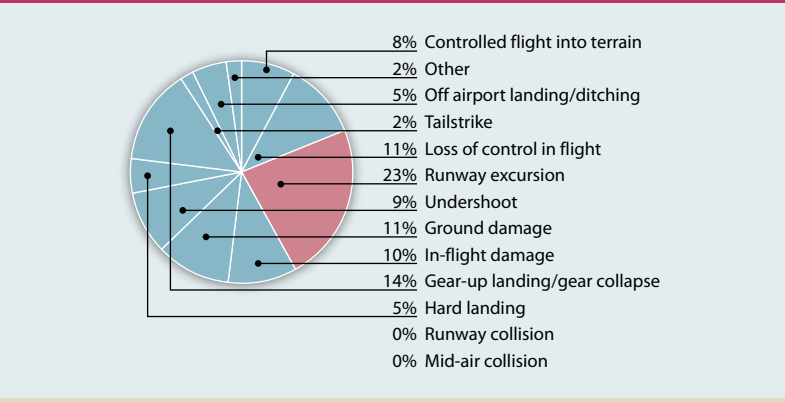
**Aircraft Hull-Loss Rate, Western-Built Jets, IATA Members vs. Industry, 2001–2010**



IATA = International Air Transport Association  
 Source: International Air Transport Association

**Figure 2**

**Worldwide Aircraft Accidents, by Accident Category, 2010**



Source: International Air Transport Association

**Figure 3**

of accident contributing factors in 2010. The report says, “While a technical fault is rarely the only or most significant cause of an accident, it can be one of the first events in a sequence leading up to an accident. ... A large percentage of maintenance-related accidents involve landing gear malfunctions.”

The category “maintenance issues as primary cause” included 11 accidents in 2010, compared with 10 in 2009 and 14 in 2008. The “total number of accidents with technical faults” was 36 in 2010, 26 in 2009 and 40 in 2008.

IATA has developed a classification system of “contributing factors” derived from a threat and error management (TEM) framework. Accidents are analyzed in terms of those categories, each divided and subdivided down to a granular level. The “top level” contributing factors include latent conditions, threats, flight crew errors and undesired aircraft states.

For 2010 runway excursions, the most frequent contributing factors under the heading of threats were “deficiencies in regulatory oversight” in latent conditions; “airport facilities,” particularly contaminated runways and poor braking action; “meteorology,” specifically wind conditions and thunderstorms; “aircraft malfunction”; “errors related to manual handling/flight controls” among flight crew errors; and the most common of all, under undesired aircraft states, “long, floated, bounced, firm, off-centerline or crabbed landing,” followed by “unstable approach” and “loss of control while on the ground.”

The IATA analysts looked for “correlations of interest” in which contributing factors tended to combine in accidents.

Among the correlations for runway excursions were these:

- “Weather (wind/wind shear/gusting wind or thunderstorms) was a factor in 71 percent of runway excursions where a long, floated, bounced, firm, off-centerline or crabbed landing occurred.”
- “In 57 percent of runway excursions where weak regulatory oversight was noted [under the contributing factor category of latent conditions], poor airport facilities were also a factor. Within these cases of poor airport facilities, contaminated runways/taxiways and/or poor braking action was a factor in 75 percent of accidents.”

A further analytical category was “accident scenarios of interest.” One runway excursion scenario, for example, was: “The flight is operating in adverse weather conditions into an airport with contaminated runways and/or poor braking action. The flight crew lands long, lands off the centerline or bounces the landing, after which the

aircraft exits the runway and is substantially damaged or destroyed. This scenario is common for 20 percent of all runway excursion accidents.”

At 11 percent of the total accidents, loss of control in flight represented a smaller proportion of the whole, but 100 percent were fatal accidents. The most prevalent contributing factors were deficiencies in “flight operations: training systems” under latent conditions; “meteorology” and “aircraft malfunction” under threats; “manual handling/flight controls” under flight crew errors; and “vertical, lateral or speed deviations” under undesired aircraft states.

Two correlations were noted:

- “Sixty-seven percent of accidents involving crew training deficiencies also cited unintentional noncompliance with SOPs [standard operating procedures].”
- “In 67 percent of accidents with vertical, lateral or speed deviations, manual handling errors were also noted.”

Controlled flight into terrain (CFIT) accidents had one of the lowest rates among the various categories, 0.19 per million sectors, compared with 0.54 for runway excursions and 0.27 for loss of control in flight. But CFIT accidents, too, had severe consequences — 86 percent involved loss of life.

Significant contributing factors to CFIT included “flight operations: training systems” under latent conditions; “poor visibility/instrument meteorological conditions” under threats; “flight crew errors related to SOP adherence/SOP

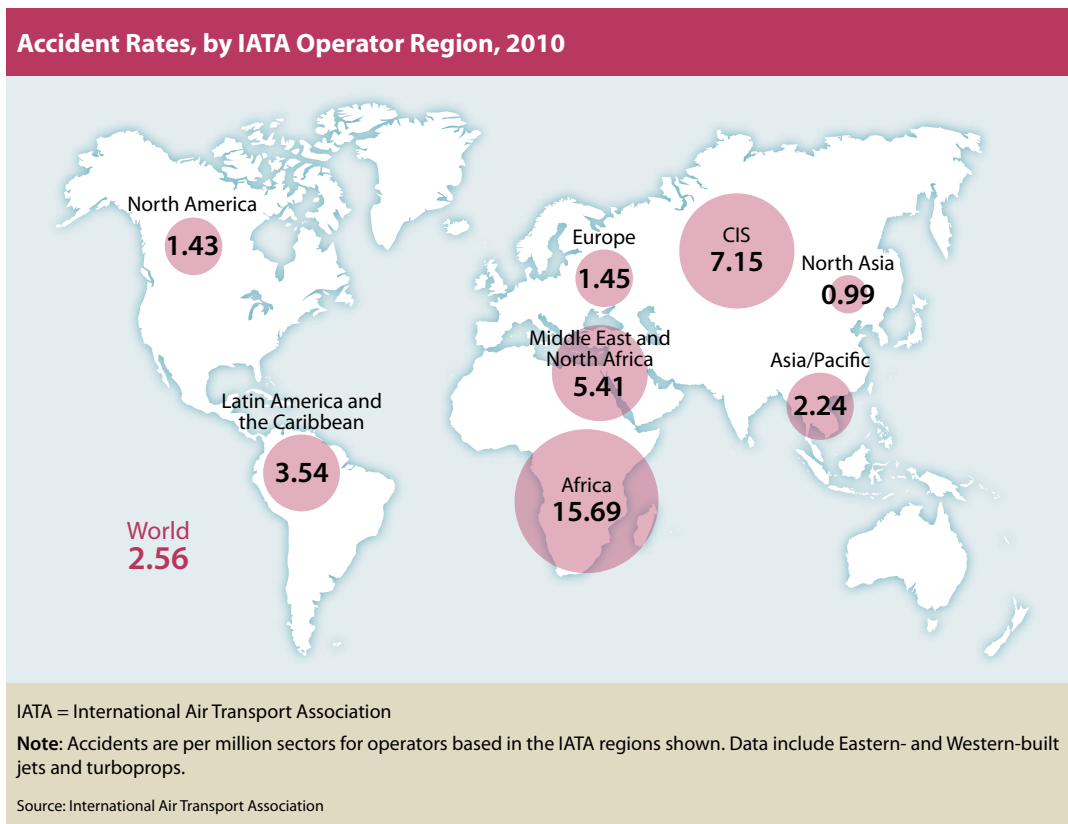
cross-verification; intentional noncompliance” under flight crew errors; “vertical, lateral or speed deviations” under undesired aircraft states; and “fatigue” as an additional classification.

As correlations, “manual handling was cited in 67 percent of CFIT accidents where lack of ground-based navigations aids was a factor. Both cases where fatigue was a factor also cited deficiencies in airline training. Regulatory oversight was a factor in 67 percent of accidents where training deficiencies were also noted.”<sup>3</sup>

The accident rates by region for jets and turboprops, Eastern- and Western-built, varied considerably among IATA-defined regions (Figure 4).<sup>4</sup>

“From a regional perspective, the Western-built jet hull loss rates remained the same or decreased in all IATA regions except North Asia and Latin America and the Caribbean,” the report says.

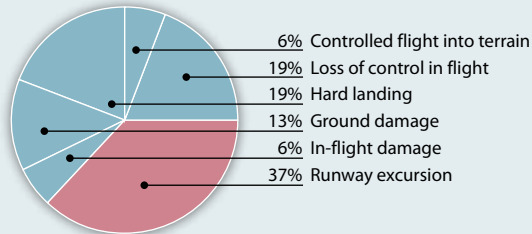
Africa’s 15.69 accidents per million sectors was the highest rate, but a lower percentage of those accidents were fatal than in some other



**Figure 4**

regions — Asia/Pacific, Latin America and the Caribbean, and the Commonwealth of Independent States (CIS), for instance.

### IATA Africa Region Accidents, by Category, 2010

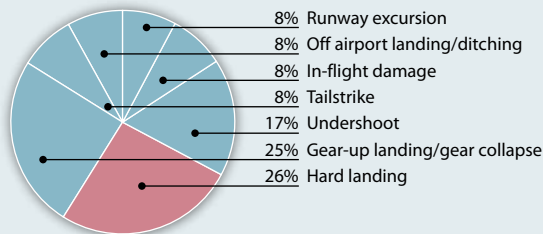


IATA = International Air Transport Association

Source: International Air Transport Association

Figure 5

### IATA Europe Region Accidents, by Category, 2010

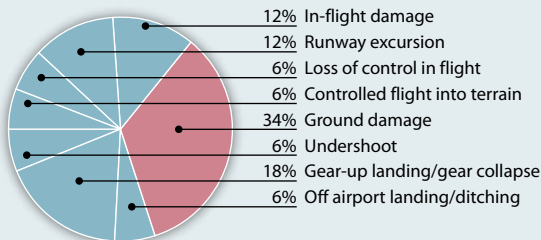


IATA = International Air Transport Association

Source: International Air Transport Association

Figure 6

### IATA North America Region Accidents, by Category, 2010



IATA = International Air Transport Association

Note: One accident was not placed into any of the categories.

Source: International Air Transport Association

Figure 7

Runway excursions were the most frequent accident category in Africa (Figure 5), Asia/Pacific and the CIS, at 37 percent of the total, 34 percent and 45 percent, respectively. Hard landing, at 26 percent, ranked highest in Europe (Figure 6). Loss of control in flight was the most common category in Latin America and the Caribbean, representing 33 percent of accidents. In the North America region, the leading category was ground damage (Figure 7).

Europe, as well as Latin America and the Caribbean, had no CFIT accidents. But 23 percent of accidents in the Middle East and North Africa region were CFIT. One of the three total accidents in the North Asia region was CFIT.

For all Western-built jet aircraft in cargo service, the operational accident rate was 5.15 per 1,000 aircraft, compared with 2.22 for passenger-service aircraft.<sup>5</sup> Western-built turboprops in cargo service had 4.31 operational accidents per 1,000 aircraft, versus 3.94 for passenger-service aircraft. Loss of control in flight and runway excursion were tied for the largest category among cargo aircraft accidents, at 22 percent each.

#### Notes

1. IATA. *Safety Report 2010*. 47th edition. April 2011. Available for purchase via the Internet at <bit.ly/p7WaYX>.
2. Flight Safety Foundation views hull-loss numbers and rates as more of an economic than a safety metric. The IATA report includes a mixture of hull-loss data, accident numbers and accident rates.
3. There were 20 runway excursions, seven CFIT accidents and 10 loss of control accidents. Because of the small numbers, percentages for contributing factors, correlations and accident scenarios suggest threats and errors worth considering but should not be taken as definitive evidence of relative risks.
4. The region assigned to an accident is based on the operator's country, not the location of the accident.
5. An operational accident is one "believed to represent the risks of normal commercial aviation, generally accidents which occur during normal revenue operations or positioning flights." This definition excludes sabotage as well as crew training, demonstration and test flights.