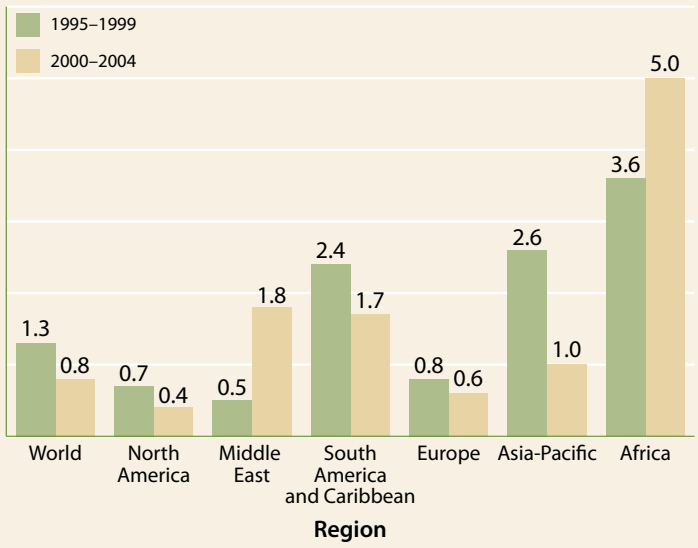
Tanzania's Runway Game

Aircraft system/component failure is high on the list of accident and incident causal factors, not to mention zebras on the runway.

BY RICK DARBY

Africa has the highest rate of fatal accidents in commercial air transport among all International Civil Aviation Organization (ICAO) regions, and the trend has not been improving (Figure 1). The International Air Transport Association (IATA) calculated that in 2005, total hull losses per million departures were 12.9 times the world average.[1] The report from the ICAO conference at which the IATA data were presented said, "Causal factors for the accidents occurring in Africa are generally difficult to identify due to the lack of proper reporting and/or investigation of the occurrences. Often, data on accidents and serious incidents are known from various sources, including the media, but some are not available in the ICAO Accident/Incident Data Reporting (ADREP) system due to lack of compliance by some states with *Annex 13 — Aircraft Accident and Incident Investigation*."

Fatal Accidents per Million Departures, Commercial Air Transport



Source: International Civil Aviation Organization

Figure 1

Although Tanzania is not a proxy for all of Africa, data published recently about causal factors of that country's aviation accidents and incidents offer some insight into safety issues in sub-Saharan states.[2] They show that when the ICAO/Commercial Aviation Safety Team (ICAO/CAST) aviation occurrence categories were applied to Tanzanian aviation accident and incident data for the 1997–April 13, 2006, period, the most frequent causal factor was "system/component failure or malfunction, non-powerplant" (Figure 2).

Following that, in descending order, were "system/component failure or malfunction, powerplant"; "abnormal runway contact"; "runway incursion, animal"; "undershoot/overshoot"; and "aerodrome."

In accidents involving fatalities between 1997 and April 13, 2006, the ICAO/CAST category that ranked highest in the number of fatalities was "controlled flight into terrain," or CFIT (Figure 3).[3] Following in descending order were "loss of control in flight" and "overload."

The category involving the largest number of injuries was "system/component failure or malfunction, non-powerplant," followed by "undershoot/overshoot."

While pointing out that data on worldwide fatal accidents for large commercial jets and both fatal and nonfatal accidents for all aircraft in Tanzania are not directly comparable, the report said that "some remarkable differences can be seen." It itemized them:

- "Controlled flight into terrain and loss of control in flight, which are the most frequent causes for accidents in other parts of the world, are not in the top six causes for accidents in Tanzania";
- "Runway excursions and fire or smoke in the aircraft, which are in the top six causes for fatal accidents worldwide, are not in the top six causes for accidents in Tanzania";
- "System component failure, both powerplant and non-powerplant (mainly landing gear failures), are higher on the list of most probable causes for accidents/incidents in Tanzania than they are for the rest of the world"; and,
- "Abnormal runway contact (mostly hard landings and [gear-up] landings), runway incursion by animals that wander across the runway (mostly giraffes, zebras and antelopes), undershoot and overshoot of the runway, and 'aerodrome' (mostly damage to landing gear by potholes, foreign object damage caused by loose stones, ingestion of stones by engines, etc.) are unique for Tanzania compared to the rest of the world."

Who's Worried?

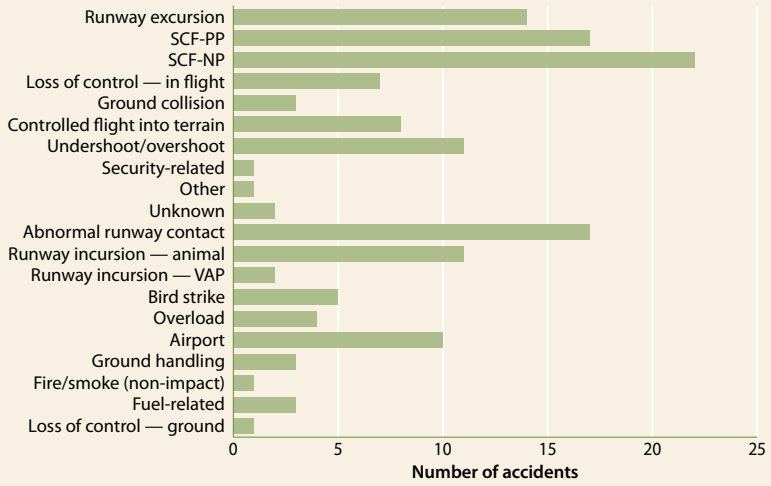
In late 2007, the Australian Civil Aviation Safety Authority (CASA) commissioned the fourth in a series of surveys on the Australian public's perceptions of aviation safety in the country.[4] "The 2008 report shows that the Australian public perceptions … are more positive across a range of measures (confidence in arriving safely, belief in flight safety) than in 2005," the report says.

Slightly more than three-quarters of Australians are "completely" or "very" confident about arriving safely when traveling between state capital cities, with the "completely confident" passengers a higher percentage than in either of the two previous surveys.

The survey found that respondents who had never flown between capital cities were less likely to be completely confident than the experienced population, about 28 percent versus 45 percent. About 6 percent of those who had not flown between capital cities were "very concerned" about arriving safely.

"Levels of confidence and concern are related closely to the recency of flight experience for the individual and whether a person has flown at all,"

Aviation Accidents and Associated Causal Factors, Tanzania, 1997–April 13, 2006

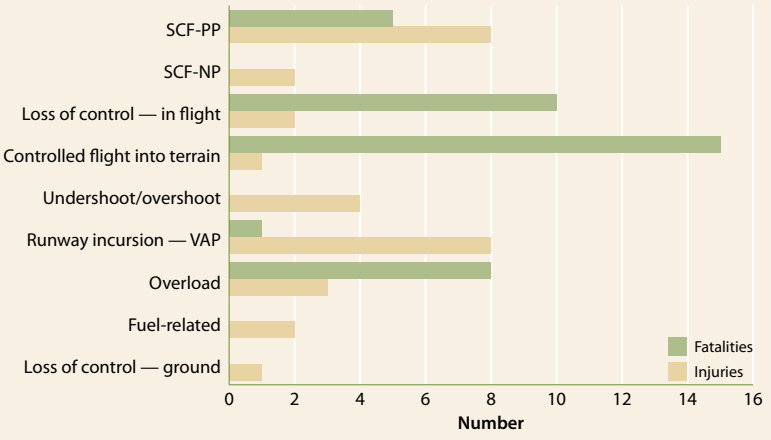


SCF-PP = system/component failure or malfunction (powerplant); SCF-NP = system/component failure or malfunction (non-powerplant); VAP = vehicle, aircraft or person

Source: Hans van Dijkhuizen, for Directorate General of Civil Aviation and Freight Transport, Netherlands

Figure 2

Aviation Fatalities and Injuries and Associated Causal Factors, Tanzania, 1997–April 13, 2006



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Source: Hans van Dijkhuizen, for Directorate General of Civil Aviation and Freight Transport, Netherlands

Figure 3

the report says. Of those who had flown less than a year earlier, 78 percent were either "totally" or "very" confident of arriving safely, compared with 64 percent of those who had never flown. Thirteen percent of those who had never flown were concerned about safety.

Of those who expressed some concern for safety when flying between state capital cities, the most frequently cited reasons were "psychological factors," "mechanical/ technical problem," "terrorism or sabotage" and "human error" (Table 1).

In the last two of those categories, the percentages showed considerable change from earlier surveys. The response "terrorism or sabotage," which had worried 52 percent of those reporting concern in 2005, was reduced to 16 percent in 2008. But 14 percent of the concerned passengers mentioned "human error" in 2008, versus 1 percent in 2005. "CASA may need to consider recent news reports or the regular scheduling of air crash investigation television shows as contributing factors to this increase," the report said.

Some demographic differences were found in the responses (Table 2). Males and high-income travelers were more likely to be confident of arriving safely than those in other groups.

Sources

1. ICAO. "Directors General of Civil Aviation Conference on a Global Strategy for Aviation Safety: The Status of Aviation Safety in Africa." 2006. Available via the Internet at <www.icao.int/icao/en/dgca/wp/dgca_06_wp_18_e.pdf>.
2. Van Dijkhuizen, Hans. *The African Aviation Safety System: Overcoming Bottlenecks With the Implementation of New Technologies.* M.Sc. thesis written at the request of the Directorate General of Civil Aviation and Freight Transport, Netherlands. No date; received at *ASW* in February 2009.
3. Some caveats are noted in the report. Tanzanian data include all aircraft, including jets with less than 60,000 lb (27,216 kg) maximum takeoff weight, helicopters and general aviation aircraft. The author "used his own knowledge and judgment in the classification of causes for fatal accidents." With only seven fatal accidents in the period, involving 39 fatalities and 23 injuries, the data are "extremely sensitive to chance and extreme values (outliers)."
4. *Public Attitudes to Aviation Safety 2008.* Roy Morgan Research, prepared for CASA. June 2008. Available via the Internet at <www.casa.gov.au/media/researchstats.htm>. The main fieldwork was performed in February 2008, with 1,526 telephone interviews of a nationally representative sample of Australians aged 18 and older.

Australian Public Reasons for Concern About Flying

	2008 (n = 64)	2005 (n = 79)	2002 (n = 174)
Psychological factors	29%	26%	42%
Mechanical/technical problem	26%	16%	18%
Terrorism or sabotage	16%	52%	22%
Human error	14%	1%	4%
Cost cutting/financial struggles	3%	—	2%
Due to what I've seen or heard through the media	2%	—	1%
Fear of crashing/too many accidents	—	2%	2%
Other	7%	2%	6%
Unable to specify a reason for their concern/ cannot say	3%	1%	2%

Note: The survey question specified flying between Australian state capital cities.

Source: Australian Civil Aviation Safety Authority

Table 1

Australian Public Confidence and Concern About Flying, by Demographics

		Sex		Household Income		Age of Respondent — Summary				
	Total (n = 1,526)	Male (n = 753)	Female (n = 773)	< $50,000 (n = 291)	> $50,000 (n = 832)	18–24 (n = 182)	25–34 (n = 270)	35–49 (n = 439)	50–64 (n = 392)	65+ (n = 243)
Completely confident	43%	50%	37%	34%	50%	42%	44%	46%	41%	43%
Very confident	35%	32%	38%	41%	32%	34%	34%	35%	39%	31%
Reasonably confident	17%	14%	20%	19%	15%	19%	17%	16%	15%	21%
Somewhat concerned	2%	2%	4%	4%	1%	3%	3%	2%	2%	5%
Very concerned	2%	1%	2%	2%	1%	2%	2%	1%	2%	1%

Note: The survey question specified flying between Australian state capital cities.

Source: Australian Civil Aviation Safety Authority

Table 2