BY RICK DARBY

Side Trips

Runway conditions were only one factor in excursions, U.K. data show.

Flight crew actions or failures to act were the most significant factors in fatal runway excursions, according to data analyzed by a U.K. Civil Aviation Authority (CAA) task force.

The task force was one of seven groups formed to address the top seven safety risks previously identified by the CAA. "The task forces were explicitly asked not to duplicate work but to identify where any additional safety intervention was required," says the report on the initiative.[1] The Runway Overrun or Excursion Task Force based its study and recommendations on "information [that] was already available from CAA data," the report says. No specific information about the study period of the database is given in the report.

The task force looked at runway excursions from two angles: fatal accidents and U.K. mandatory occurrence reports (MORs).[2] A runway excursion was defined for the task force's purposes as "an aircraft inadvertently or uncontrollably leaving a runway end or side, usually during landing but also during takeoffs, especially following a rejected takeoff."

Considering fatal runway excursions, the most significant factors ranked by numbers of accidents were "crew," "aircraft," "weather," "runway" and "air traffic control (ATC)," in that order (Figure 1).

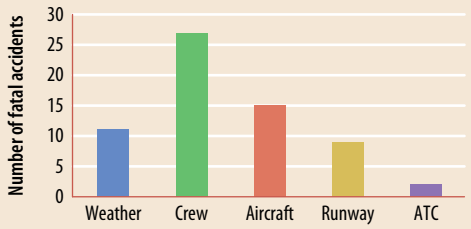
A further breakdown of factors involved in fatal runway excursions shows the most frequent factor to be "aircraft other technical failure," the "other" distinguishing this category from "brakes technical failure" and "aircraft prior faults" (Figure 2). That factor was found in 12 of the accidents. "Crew: flight handling" was found in 10 accidents. Runway surface conditions played a relatively small role.

The largest number of MORs involved weather as a factor (Figure 3). Runway conditions were the next-most frequent category.

In the more detailed analysis, "runway surface water" and "rain" were the most common factors, cited in 15 and 14 MORs respectively (Figure 4, p. 52). "Surface winds" and "aircraft technical failure" were also prominent in the tally.

To sum up, it appeared from the data that crew and aircraft factors played the largest roles in fatal accidents involving excursions, while weather and runway conditions were most frequent in the hazardous situations reported.

Most Significant Factors, Fatal Runway Excursions



ATC = air traffic control

Source: U.K. Civil Aviation Authority

Figure 1

Those seeking to supplement the CAA data may consult the *Runway Excursion Risk Reduction Toolkit*, produced by the International Air Transport Association and Flight Safety Foundation, based on research by the Runway Safety Initiative members. Among the tool kit's findings were that during a 14-year period, 97 percent of runway accidents were excursions. Although a low percentage of excursion accidents were fatal, the large number of excursions meant that excursions resulted in more fatalities than incursions — traffic conflicts on runways and taxiways.

Controlled Flight Into Terrain

The report also cites data from the CAA Controlled Flight Into Terrain Task Force:

- For the 10-year period 1998 to 2007, 57 — 23 percent — of 245 worldwide fatal accidents involved controlled flight into terrain (CFIT).[3]
- Of those 57 CFIT accidents, 39, or 68 percent, occurred during the approach or final approach phases of flight, with 59 percent of the 39 involving nonprecision approaches. The rest of the approach or final approach CFIT accidents occurred during visual or "user-defined" approaches.
- The top five causal factors in the fatal CFIT accidents were, in order, "lack of positional awareness in air"; "omission of action/inappropriate action"; "failure in crew resource management (crosscheck/coordinate)"; "slow and/or low on approach"; and "press-on-it is," or self-directed pressure to continue the approach.

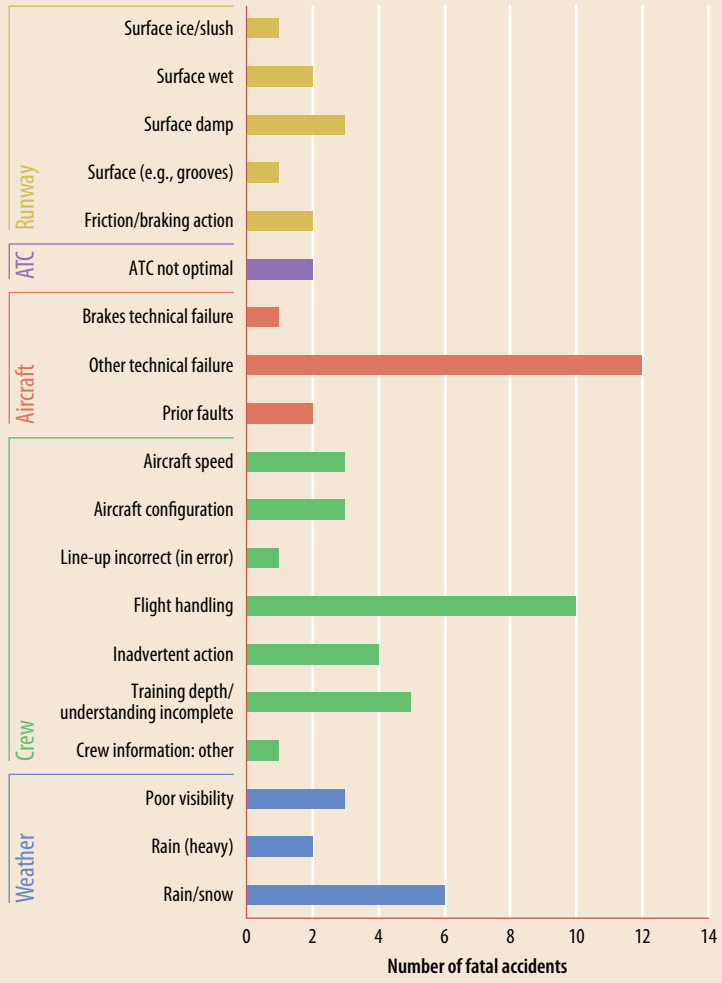
"The 'omission of action/inappropriate action' causal factor related largely to continued descent below [safe] altitudes or decision heights without visual reference and/or failure to fly a missed approach," the report says.

The task force analyzed "serious" CFIT-related MORs involving U.K. aircraft and/or U.K. airspace.[4]

Of the 24 occurrences meeting the criteria, 17, or 71 percent, occurred during the approach phase. Of those 17, 65 percent involved nonprecision or circling approaches.

"Most of the occurrences involved vertical flight path management errors such as significant deviations below the glideslope and/or cleared altitude, descent below decision/[safe] attitudes

Factors, Fatal Runway Excursions

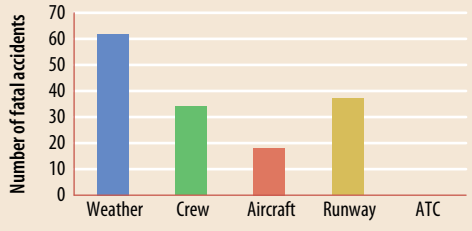


ATC = air traffic control

Source: U.K. Civil Aviation Authority

Figure 2

Most Significant Factors, U.K. MOR Runway Excursions

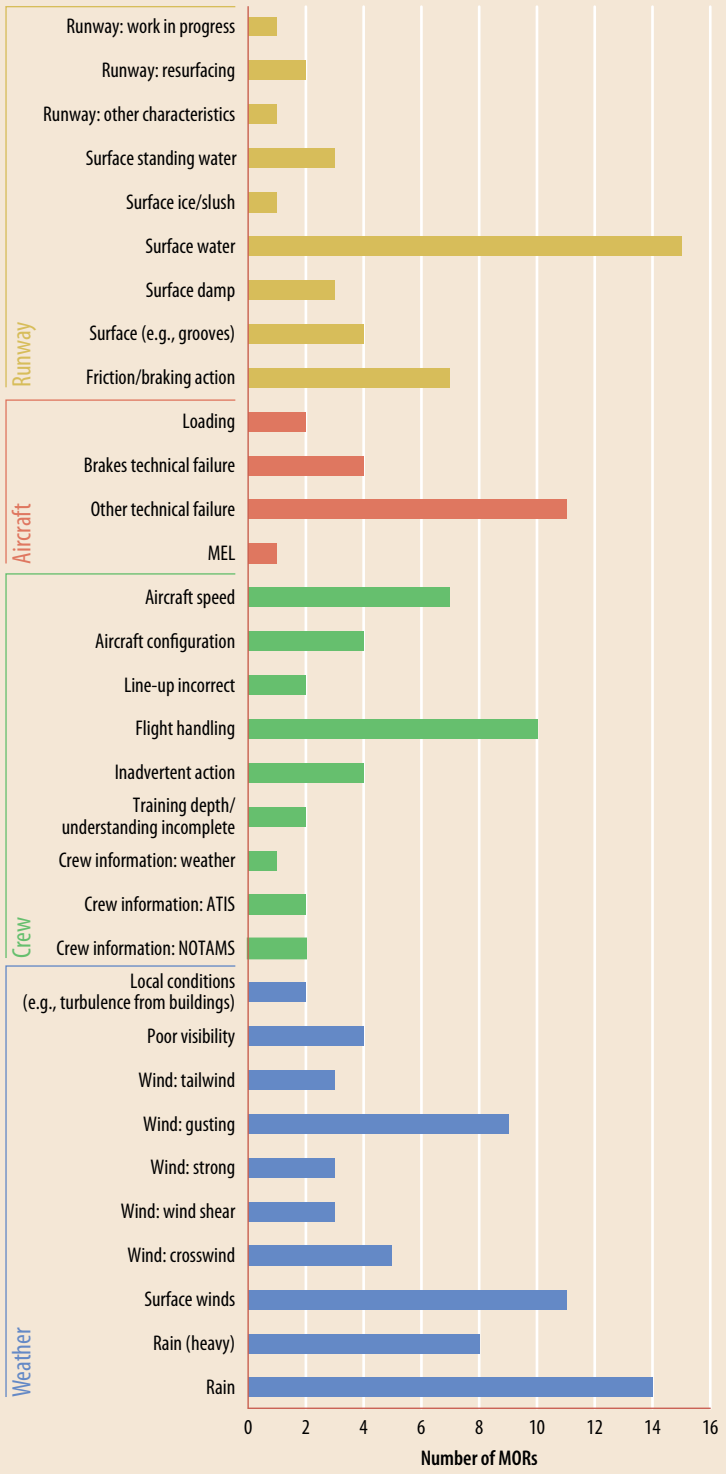


ATC = air traffic control;
MOR = mandatory occurrence report

Source: U.K. Civil Aviation Authority

Figure 3

Factors, MOR Runway Excursions



ATIS = automatic terminal information service; MEL = minimum equipment list; MOR = mandatory occurrence report; NOTAMS = notices to airmen

Source: U.K. Civil Aviation Authority

Figure 4

without the required visual reference and unstable approaches," the report says.

Other common factors included nonadherence to standard operating procedures such as required callouts, the report says.

Interventions and warnings helped resolve a situation safely in some cases. The report cites ATC actions such as "issuing a go-around instruction, providing heading guidance and questioning [the] aircraft's altitude as a positive factor in 13 occurrences. Ground-proximity warning system or enhanced ground-proximity warning system [EGPWS] alerts or warnings helped to avert accidents in 10 occurrences.

"However, EGPWS warnings were insufficient for the two most severe occurrences, in which U.K. aircraft descended to within 56 ft and 121 ft of terrain at Addis Ababa [Ethiopia] and Khartoum [Sudan] respectively," the report says. "The common link in these two cases was that GPS [global positioning system] was not used as a source of position information for TAWS [terrain awareness and warning system]."

Notes

1. CAA. "CAA 'Significant Seven' Task Force Reports." CAA paper 2011/03. March 2011. Available via the Internet at <www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=4452>.
2. MORs, described in U.K. CAA Publication CAP 382, *The Mandatory Occurrence Reporting Scheme: Information and Guidance*, <www.caa.co.uk/application.aspx?catid=33&pagetype=65&appid=11&mode=detail&id=214>, are required reports to the CAA for hazardous situations that occur or would have occurred without corrective action, and "whenever the reporter believes that there is a safety operational, maintenance or airworthiness-related issue that should be investigated by the CAA."
3. The fatal accidents in the database involved jet or turboprop airplanes with original certified takeoff weights greater than 5,700 kg/12,500 lb, engaged in passenger or cargo flights.
4. The data included reportable accidents and/or grade A or grade B MORs involving jet or turboprop airplanes with original certified takeoff weights greater than 5,700 kg/12,500 lb, engaged in passenger or cargo flights. Grade A and grade B MORs are defined by the CAA as "high severity."