


An act of FOD



There are many risks that must be managed to ensure the safe landing and take off of aircraft, but having caused serious accidents over the years, foreign object damage (FOD) is among the most pertinent. Jim Banks talks to **Brett Patterson** of Vancouver International Airport, who explores the current solutions, and whether they are working to good effect.

In the arena of runway safety management, there is an emphasis on runway excursions, particularly after the Air India Express accident in May, when the aircraft overran the runway at Mangalore Airport. However, FOD damage remains one of the greatest risks to aircraft safety, and airlines and airports know they must take steps to control it.

The prime driver is safety, with FOD having been thrust into the spotlight in 2000, when an Air France Concorde crashed at Charles de Gaulle International Airport having struck a piece of titanium debris on the runway, killing 113 people.

A secondary motivation for controlling FOD is cost. Estimates from National Aerospace FOD Prevention Inc (NAFPI) suggest the global airline industry incurs \$4 billion in costs from debris damage and delays caused by FOD. Other estimates put the figure much higher at around \$12 billion.

"FOD and wildlife management are the main issues for us; we have an automated detection system to augment

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our visual inspection and identify foreign objects on the runway," says Brett Patterson, director of airside operations at Vancouver International Airport (YVR).

Canada's second busiest airport, Vancouver International, handled over 16 million passenger movements last year and saw 258,000 aircraft take-offs and landings. Over the years passenger numbers, and therefore the number of flights, have risen dramatically, but the airport has had very few incidents of FOD.

"We usually do four daily runway inspections every six hours, in line with ICAO recommendations. Still, you are only on the runway for 1% of operational time," says Patterson.

"We've had a couple of major incidents. Once, the engine cowling from an A330

fell on the runway at night, just after an inspection. The second instance was when a pogo stick from the back end of a Dash 8 lay on the runway. Eight or ten aircraft used the runway before it was noticed. These events motivated us to augment the visual checks," he adds.

In 2007, the airport began using the Tarsier runway debris detection radar system, developed after the Concorde crash in Paris. Initially, four Tarsier units covered the north and south parallel runways. The system uses a high-resolution millimeter wave radar to detect small hazards on the runway, with an accuracy of 3m at a range of up to 2km, and can detect materials including metal, plastic, glass, wood, fibre glass and animal remains. >>

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Dynamic monitoring

Developed by UK-based company QinetiQ, the Tarsier system was trialed at YVR for one week in summer 2004. It helped the airport to detect and clear instances of FOD in less than five minutes. YVR bought the system in 2005, and it went live the following year.

Since installing the system, YVR has added further enhancements to its runway monitoring. It became the first commercial airport to install day and night cameras to the existing radar technology, enabling its detection system to provide visual confirmation of debris detection at any time of day, regardless of the weather.

The cameras, also provided by QinetiQ, include an innovative illuminator, which helps operators to identify debris with greater certainty, even in low-light conditions.

"If you detect FOD at the departing end of the runway where it would not endanger aircraft much, you may not need to re-route incoming aircraft. Also, you can tell whether the foreign object is a food

source for birds, creating greater risk," observes Patterson.

"Safety is priority, but if you can have greater efficiency at the same time, you have a win-win situation. If, during congestion, we can have uninterrupted use of the runway, then there is a cost saving. We are better positioned to make risk-management decisions," he adds.

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Since the enhanced system went into operation, YVR operators have seen more FOD than they previously thought existed. But the ability to not only precisely locate a 2-inch piece of debris on a runway, but also to determine whether it poses a risk to aircraft, means the airport can minimise the risk of FOD.

The four Tarsier radar and camera units at YVR are mounted on towers, varying in height from 3m to 7m, and are set back 150m from the centre of the runway for

maximum coverage, sweeping the runways every minute.

"The system is like a fire alarm and is calibrated for a two-inch bolt anywhere on the runway. If it detects an object, it alerts us with audible and visual alarms. The operator can then look with high-powered cameras at precise GPS coordinates to focus on the FOD," Patterson explains.

"Those coordinates can be exported to the responding vehicle, giving us a huge saving compared with visual spotting. The location is more precise, so there are no more fishing expeditions to find the FOD. A year ago, we picked up a grounding wire from a fuel hydrant cart. It was a 40-inch steel cable lying right across the runway. We saw it straight away and cleared it before it affected any aircraft. The system has helped us identify FOD and the sources of FOD." ■



BAA Global FOD Conference 9 - 10 November 2010

Heathrow Airport invites you to attend a free two day foreign object debris (FOD) conference.

Heathrow is at the forefront of innovation in FOD detection, and in 2007 was the first European airport to install TARSIER, the world's first runway hazard management system with automatic FOD detection capabilities.

The system has assisted in some significant finds on Heathrow's runways, however the fight against FOD starts at source, be it at the security post, on the ramp or in the baggage areas.

This conference is a unique opportunity to discuss and share best practice, hear about current and future legislation, and understand where technology is now and where it will go in the future.

For more information, please register your interest by emailing FODConference@baa.com

BAA gratefully acknowledge the support of Qinetiq who are co-sponsoring this event

Speakers confirmed

- FAA
- CAA
- Rolls-Royce
- United Airlines

Highlights

- Networking drinks reception and dinner
- Optional tour of Heathrow

"The management of FOD is a key safety issue for all airports and one which should not be underestimated or overlooked. AOA fully supports and commends this important conference and is pleased that such an impressive range of expert speakers has been organised to give the best possible advice and guidance on FOD and its effective management"

Airport Operators Association, July 2010

