RISK OF COLLISIONS FROM RUNWAY INCURSIONS

Runway incursions lead to an ongoing risk of aircraft colliding with vehicles or other aircraft at Canadian airports.

The situation

Every year, there are millions of successful takeoffs and landings on Canadian runways. However, an accident can occur when an aircraft or vehicle mistakenly occupies an active runway.

Number of occurrences in Canada

From 2013 to 2017, NAV CANADA recorded an average of 445 runway incursions each year. The incursion rate per aircraft movement gradually increased from 6.6 incursions to 7.8 per 100 000 arrivals and departures over this time period.

While the majority of these incursions posed little to no risk, there were 21 high-severity[1] events in each of the past 2 years. These could have led to a collision with aircraft, damage, injuries, and loss of life.

The risks to people, property, and the environment

Since this issue was first put on the Watchlist in 2010, the TSB has completed 10 investigations[2] into runway incursions and launched a safety issues investigation focused on the south complex parallel runways at Toronto/Lester B. Pearson International Airport (CYYZ).[3]

Although there has not been a recent accident as a result of a runway incursion in Canada, the potential consequences of a collision could be catastrophic.[4] If more aggressive hazard identification and mitigation strategies are not implemented by the aviation industry, the risk of collisions from runway incursions will remain.

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1 International Civil Aviation Organization, *Manual on the Prevention of Runway Incursions*, 1st edition (2007)—Category A: a serious incident in which a collision is narrowly avoided; Category B: an incident in which separation decreases and there is significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.

2 TSB aviation investigation reports A10W0040, A11Q0170, A13O0045, A13O0049, A13H0003, A14W0046, A14H0002, A14C0112, A16O0016, and A16W0170.

3 TSB aviation investigation A17O0038.

4 On 11 February 1978, 42 people on board Pacific Western Airlines Flight 314 were killed as a result of an incursion accident at Cranbrook/Canadian Rockies International Airport, British Columbia.

A global concern

Runway incursions are a global concern. The International Civil Aviation Organization (ICAO)'s 2017 Global Runway Safety Action Plan notes that "although the [number of] runway incursion accidents reported between the period of 2008 to 2016 is very low, the number of runway incursion incidents remains high."

The TSB is concerned that the rate of runway incursions in Canada and the associated risk of collision will remain until effective defences that are tailored to address previously identified hazards are implemented at airports and in aircraft, vehicles, and air traffic service facilities across Canada.

Actions taken

Aviation industry stakeholders have addressed factors that can lead to runway incursions by implementing incremental improvements to policies, procedures, technologies, and infrastructure. For example, in Canada, in-cockpit aids to increase situational awareness, such as electronic flight bags with moving maps, are becoming more prevalent.

Despite actions taken, there has been an 18% increase in the overall rate of runway incursions from 2013 to 2017.

Additional technological improvements could be made, for example, runway status lights, a form of direct-to-pilot warning. These exist in at least 23 international locations, though none has yet been installed in Canada.

Actions required

This issue will remain on the TSB Watchlist until the rate of runway incursions, particularly the most severe ones, demonstrates a sustained reduction.

Transport Canada and all sectors of the aviation industry must continue to collaborate and develop tailored solutions to identified hazards at Canadian airports. These solutions could include improvements in air traffic control procedures, surveillance and warning systems, runway and taxiway designs, holding position visual aids, and flight crew training and procedures.

Modern technical solutions, such as in-cockpit electronic situational awareness aids, and direct-to-pilot warnings, such as runway status lights, should also be implemented.