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TECHNICAL COMMISSION

Agenda Item 30: Runway safety

RUNWAY SAFETY CHALLENGES AND EXPERIENCES IN CANADA- IMPLEMENTING PRACTICAL SOLUTIONS

(Presented by Canada)

EXECUTIVE SUMMARY

This working paper provides an overview of the progress by Canada regarding work to implement solutions aimed at reducing occurrences of runway incursions and runway excursions.

To facilitate development of the most appropriate measures for each type of occurrence, efforts should be made as much as possible to ensure that the study and analysis of runway incursions and runway excursions are conducted separately and with distinct objectives.

Canada affirms its support for a 2011 Global Runway Safety Symposium organized by ICAO and for the future work identified in working paper, A37-WP/68, taken within the context of overall priorities and resources of ICAO.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A.
<i>Financial implications:</i>	Not applicable.
<i>References:</i>	A37-WP/68

1. INTRODUCTION

1.1 Improving runway safety, including the reduction of risk of runway incursions and runway excursions at Canadian airports are among the Government of Canada's priorities in ensuring a safe air transportation system. In Canada, there are over 1380 runways at 1115 total airports and aerodromes nationwide, including National Airport System (NAS) airports. Canada's NAS is comprised of 26 airports, considered essential to Canada's air transportation system, that link the country from coast to coast and internationally.

1.2 Between 1999 and 2009, there were 4207 runway incursions reported nationwide. Given the millions of take-offs and landings each year, incursions are rare; however, the consequences can be catastrophic. Transport Canada, working with Canada's air navigation services provider, NAV CANADA, and other industry stakeholders, has developed comprehensive studies and plans of action to reduce the rate of runway incursions at Canadian airports.

1.3 Runway safety issues have been recognized as a worldwide safety concern for years. Canada has worked closely with ICAO and its Member States to find solutions to runway incursions. For example, Canada participated in the development and promotion of the 2007 ICAO Manual on the Prevention of Runway Incursions. It continues to support ICAO's efforts over the past decade, through the ICAO Runway Safety Programme, to address occurrences of both runway incursions and runway excursions. This paper will outline measures that the Government of Canada and its industry partners are taking to enhance runway safety.

2. RUNWAY INCURSIONS

2.1 Canada has a long and successful history of incursion prevention, data collection and taking proactive measures to reducing runway incursions. This is a result of the work by Transport Canada, NAV CANADA, and regular involvement of Canadian aviation industry at all stages of the process.

2.2 During the period from 1996 to 1999, there was a worldwide increase in runway incursions. In Canada, reports of runway incursions at Canadian airports increased by up to 145 per cent during this three-year period. Transport Canada and NAV CANADA each conducted studies to better understand why the rate was increasing. Transport Canada research indicated that traffic volume and complexity, airport design and capacity enhancing procedures were contributing factors to runway incursion occurrences. It proposed a model that illustrates that as complexity increases, opportunities for conflicts on the ground increase exponentially.

2.2.1 In July 1999, the Transport Canada National Civil Aviation Safety Committee formed a Sub-Committee on Runway Incursions to develop a national strategy. A Final Report by this sub-committee was published in 2000 and included over 20 recommendations.

2.3 Following the release of studies on runway incursions by Transport Canada and NAV CANADA in 2000 and 2001, respectively, the two organizations joined forces to form the Incursion Prevention Action Team (IPAT), a working group to jointly oversee the implementation of the recommendations of the studies, which included an awareness program, and regulatory and procedural changes. The measures undertaken by IPAT included improved data collection, monitoring processes and trend analysis on runway incursions across the nation. The IPAT-led promotional campaign included a new video, several newsletter articles, and regional awareness material. Other preventive actions of note include:

- a) standardization of runway and taxiway markings and signage;
- b) standardization of terminology associated with ATC instructions to taxiing aircraft;
- c) requirement for explicit and specific clearance to cross all runways including those that are inactive; and
- d) requirement for flight crews to read back taxi and hold short instructions.

2.4 From 2001 to 2005, Transport Canada actively supported the work of IPAT across the country. By 2005, all the recommendations were either fully implemented or advanced to the point where further government oversight of the carrying out of the recommendations was not considered necessary. The incursion rate had been stable for three years and the severity was assessed as low. Having fulfilled its mandate, the IPAT program evolved into an industry-led multi-disciplinary Runway Safety and Incursion Prevention Panel (RSIPP), chaired by NAV CANADA. The RSIPP was tasked to provide continued monitoring and evaluation of runway incursion prevention activities. Since its creation, Transport Canada has been participating in important work of the RSIPP.

2.4.1 The focus of the RSIPP remains on establishing connections with local runway safety activities and developing tools to support local and national runway safety knowledge and activities.

2.5 Over the last two years, Transport Canada has used information generated from its Civil Aviation Daily Occurrence Reporting System (CADORS) to study runway incursion trends between 2005 and 2009. Attention was directed at occurrences involving a second or unauthorized aircraft or an unauthorized vehicle on a runway. Wildlife and pedestrian incursions were not included. Transport Canada is in the process of evaluating incident data for this period.

2.5.1 Preliminary indications are that the number of incursions increased slightly from 2005 to 2008, but dropped in 2009. While the vast majority represented moderate to negligible risk, there were 20 occurrences where evasive action was taken.

2.5.2 Transport Canada is continuing its studies and analyses to identify the hazards and the dynamics by which the hazards lead to runway incursions. In addition, several regulatory initiatives are being undertaken by Transport Canada to enhance runway safety at Canadian airports.

2.6 Recent joint efforts by Canada and the United States resulted in the development of an enhanced taxiway marking system, which is intended to warn flight crews that they are approaching a hold position. Markings include enhanced taxiway centreline markings (e.g., yellow painted dashes on either side of the taxiway centreline leading to the hold position), extension of existing hold position surface-painted lines onto taxiway shoulders, and surface-painted hold position signs. These new measures were implemented at major United States airports between 2005 and 2008. Canadian airport operators have also readily incorporated these markings into their facilities.

3. RUNWAY EXCURSIONS

3.1 Transport Canada has conducted extensive research into runway surface condition information and processes, including runway friction measurement and reporting. The Canadian Runway Friction Index (CRFI) has been identified as a valid and reliable index. CRFI tables have been in circulation for many years for use by aircrews to understand and account for risks in planning and decision-making. Transport Canada Civil Aviation is also an active participant in the ICAO International Runway Friction Task Force.

3.2 Runway overruns and excursions constitute a serious risk to the flying public that must be addressed. In doing so, Transport Canada agrees that a runway end safety area (RESA) is a vital component of the risk reduction plan and is committed to conforming to ICAO's RESA Standard.

3.3 Transport Canada has concluded that reducing the risk will require attending to both prevention and survivability. These measures are included as part of Transport Canada's strategy to reducing runway excursions at Canadian airports. Requirements have been put in place by Transport Canada since 2006 for landings in low visibility conditions. For example, the department has issued guidelines for pilots and developed a number of regulatory amendments to help pilots with decision-making when flying in poor weather.

4. ONGOING ACTIVITIES

4.1 Transport Canada has developed regulations relating to winter maintenance and planning. These regulations include provisions for airport operators to conduct regular monitoring and dissemination of the airfield information to aircrews during winter conditions. Transport Canada is also developing regulations relating to on airside vehicle management. Included in these regulations are provisions for airport operators to conduct training and testing of all airside vehicle operators at regular intervals.

4.2 The Canadian Aviation Regulations are to be modified to include a number of measures to enhance runway incursion and runway excursion strategies:

- a) distance to go signage;
- b) mandatory use of the yellow edge lights for last third of longer runways;
- c) inclusion of high intensity Runway Guard Lights (RGL) as the only acceptable RGL system;
- d) clarification of declared distance calculations for intersection departures; and
- e) provision of Precision Approach Path Indicator (PAPI)/Abbreviated Precision Approach Path Indicator (APAPI) systems to facilitate stabilized approaches.

4.3 In recent years, Airport Surface Detection Equipment has been installed at more airports enabling controllers to detect potential runway conflicts by providing controller with a radar picture of movement on runways and taxiways. NAV CANADA and Aéroports de Montréal are jointly investing in a new multilateration surface surveillance system that will improve aircraft and vehicle visibility on the runways and the airport apron at Montreal-Trudeau Airport. The technology is called Multistatic Dependent Surveillance.

4.4 In 2010, NAV CANADA launched an area on its corporate website on behalf of RSIPP that is all about Runway Safety in Canada, and includes promotional material such as a PowerPoint presentation and posters that the aviation community can use to increase runway safety awareness. In 2010 to 2011, RSIPP will be launching a Runway Excursion awareness campaign.

4.5 In 2010, the TSB, an independent government agency created to advance transportation safety through the investigation of occurrences, added two areas of concern to its "Watchlist": An ongoing risk that aircraft may collide with vehicles or other aircraft on the ground at Canadian airports, and landing accidents and runway overruns (i.e., a sub-class of runway excursions). The Watchlist identifies the safety issues investigated by the TSB that pose the greatest risks to Canadians.

4.5.1 For runway incursions, the TSB expressed a concern to Transport Canada that incursions and the risk of collisions will remain until better defences, such as improved procedures and the adoption of enhanced collision warning systems should be required at Canada's airports. With respect to runway excursions, the TSB recommended to Transport Canada that airports need to lengthen the safety areas at

the end of runways or install other engineered structures to safely stop planes that overrun. The TSB also expressed concerns about the need for measures to be taken to ensure that pilots receive timely information about runway surface conditions, in cases of bad weather.

4.5.2 Transport Canada is working to respond to the TSB's recommendations as part of the government's overall strategy to reduce risks of runway incursion and runway excursion occurrences.

5. CONCLUSIONS

5.1 Canada has been active on runway incursion prevention and through dialogue and awareness has achieved some success.

5.2 Canada also recognizes that the establishment of a runway safety programme should strive as much as possible to ensure that runway incursions and runway excursions are studied and defined separately and with distinct objectives, in order to develop the best and most appropriate measures for each type of occurrence.

5.3 Within the context of resources and priorities, Canada supports the efforts of ICAO in the field of runway incursions and runway excursions as detailed in Paragraph 3.1 of Working Paper 68. Transport Canada and its government partners will continue their work and study, in collaboration with its industry stakeholders, to ensure long-term solutions for enhanced safety of Canadian runways.

5.4 Transport Canada supports the work of the ICAO Aerodrome Panel and Aerodrome Design Working Group and will continue to actively participate in future projects and meetings.

5.5 Canada looks forward to participating in the 2011 Global Runway Safety Symposium being organized by ICAO. This is an initiative that Canada strongly supported at the ICAO High level Safety Conference in Montreal, in March 2010.

5.6 Given the safety implications of runway incursions and runway excursions, Canada supports in principle the Draft Assembly Resolution appended to A37-WP/68 68, in particular the clause referring to a multi-disciplinary approach.

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