



**WORKING PAPER**

**ASSEMBLY — 37TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 30: Runway safety**

**TACKLING THE GLOBAL ISSUE OF RUNWAY SAFETY**

(Presented by the Council of ICAO)

**EXECUTIVE SUMMARY**

A survey by the Flight Safety Foundation of all turbine aircraft accidents for the years 1995 through 2008 has shown that thirty per cent were runway excursions (RE) and runway incursions (RI). Both types had resulted in a substantial number of fatalities. While RE accidents had accounted for a greater number of fatalities, RI accidents had a likelihood of higher severity when they did occur. The trend data for both RE and RI accidents indicates that there has been no substantial global improvement in the past fourteen years.

The ICAO Runway Safety Programme has evolved to include the prevention and mitigation of RI, RE and other occurrences related to runway safety. ICAO has developed Standards and Recommended Practices (SARPs), Procedures for Air Navigation Services (PANS), guidance material and toolkits to address various aspects of runway safety and has held a series of seminars to raise awareness. Historically, these runway safety efforts were made within individual operational specialties. However, the increasingly interconnected nature of specialties in addressing modern aviation issues requires a more holistic approach. The ICAO Runway Safety Programme is envisioned to provide a forum to include at least regulators, aircraft operators, air navigation services providers, aerodrome operators and aircraft manufacturers to holistically address runway safety issues across operational specialties.

An Assembly Resolution is proposed calling upon States to take initiatives to enhance runway safety through the establishment of runway safety programmes, to prevent and mitigate runway accidents and serious incidents.

ICAO is organizing a global runway safety symposium in 2011 and invites partnership from all international organizations and stakeholders.

**Action:** The Assembly is invited to adopt the resolution relating to runway safety contained in the Appendix.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A.
<i>Financial implications:</i>	Funding for some of these activities will need to come from a combination of potential savings related to productivity or efficiency gains within the Secretariat and voluntary contributions to the SAFE Fund.

<i>References:</i>	Annex 1 — <i>Personnel Licensing</i> Annex 6 — <i>Operation of Aircraft</i> Annex 11 — <i>Air Traffic Services</i> Annex 13 — <i>Aircraft Accident and Incident Investigation</i> Annex 14 — <i>Aerodromes</i> Annex 15 — <i>Aeronautical Information Services</i>
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## 1. INTRODUCTION

1.1 A survey by the Flight Safety Foundation of all turbine aircraft accidents for the years 1995 through 2008 has shown that 431 accidents out of 1429 total accidents (30 per cent) were runway excursions (RE) and runway incursions (RI). Of those 431 accidents, 417 (97 per cent) were RE with the remaining 14 (3 per cent) being RI. Forty-one (10 per cent) were fatal with 973 total fatalities. Of the 41 fatal accidents, 34 (83 per cent) were RE with the remaining 7 (17 per cent) being RI. Of the 973 fatalities, 712 (73 per cent) were attributable to RE and 261 (27 per cent) were attributable to RI. The much greater number of RE accidents has resulted in a substantially greater number of fatalities, but the 27 per cent of fatalities attributable to RI when RI represents only 3 per cent of all runway accidents, shows the likelihood of higher severity accidents when they do occur.

1.2 The trend data for both RE and RI accidents indicates that there has been no substantial global improvement in the past fourteen years.

1.3 The ICAO Accident/Incident Data Reporting (ADREP) system indicates that RE are the highest single occurrence category of all accidents over the last 10 years for all commercial and general aviation operations of fixed-wing aircraft above 5 700 kg certified maximum take-off mass.

1.4 Potential prevention strategies for RE and RI must be developed with the cooperation of several operational specialities, to include at least regulators, aircraft operators, air navigation services providers, aerodrome operators and aircraft manufacturers. These areas should also be included in the ICAO Runway Safety Programme.

## 2. ICAO RUNWAY SAFETY PROGRAMME

2.1 ICAO's dedicated focus on runway safety efforts began in 2002 with an education and awareness campaign that consisted of a series of seminars in ICAO regions to disseminate information on the prevention of RI, the development of guidance material and a runway safety toolkit. As the frequency and severity of RE became more apparent it was considered appropriate to address all runway safety issues in a comprehensive manner. Therefore, the ICAO Runway Safety Programme has been expanded to cover both RE and RI, as well as other occurrences and activities related to runway safety.

### 2.2 Runway excursion

2.2.1 ICAO's runway safety efforts currently underway in regard to RE include development of:

- a) provisions for runway end safety areas (RESA) and associated mitigating measures;
- b) provisions for runway friction measurement and surface condition assessment and reporting, and development of a circular providing runway friction-related information and guidance;
- c) provisions that promote stabilized approaches, including performance-based navigation (PBN), air traffic control (ATC) procedures and visual aids, etc.;
- d) provisions for standardized visual aids providing consistent situational awareness for flight crews; and
- e) a joint ICAO/IATA Runway Excursion Risk Reduction Toolkit providing a multi-disciplinary perspective.

## **2.3 Runway incursion**

2.3.1 ICAO's runway safety efforts in regard to RI since 2002 include development of:

- a) SARPs, PANS and guidance material for the integrated use of visual aids to help prevent RI;
- b) guidance on the use of appropriate ATC procedures and surface movement and guidance control systems (SMGCS) and advanced surface movement and guidance control systems (A-SMGCS), including surface movement radar, ADS-B and multilateration and other possible sensors;
- c) guidance material on the prevention of RI and a runway safety toolkit;
- d) standardized controller-pilot-driver communications;
- e) standardized RI terminology and improvements in the collection of RI data; and
- f) human factors considerations of clearance compliance.

## **2.4 Other activities related to runway safety**

2.4.1 ICAO's runway safety efforts and activities currently underway include:

- a) development of provisions concerning the regular inspection, monitoring and maintenance of movement areas, including runways, so that runway pavements are kept clear of foreign object debris (FOD);
- b) expansion of bird strike hazard reduction provisions to include all wildlife;
- c) development of provisions concerning the use of the new performance level "C" foam for aircraft rescue and fire fighting; and

- d) development of provisions relating to the reporting and forecasting of meteorological conditions (precipitation, fog and volcanic ash deposition), and reporting of crosswind and tailwind components of wind and wind shear warnings at aerodromes.

### 3. **FUTURE WORK**

3.1 ICAO's future runway safety efforts will include:

- a) development of provisions for a global reporting format, including common taxonomy, for runway surface conditions and their correlation to aircraft braking performance to help prevent RE;
- b) development of provisions to address RI and RE from an aerodrome design perspective;
- c) study and adoption of technological solutions to RI and RE;
- d) development of a standard TRAINAIR training package on the prevention of RI;
- e) continued development of training strategies for flight crews in threat and error management, especially as it relates to unstabilized approaches;
- f) study of human factors in relation to RE;
- g) development of guidance on the use of automated FOD detection systems;
- h) consideration of including runway safety in the development of the PANS-Aerodromes document; and
- i) a gap analysis of the ICAO Runway Safety Programme to identify any areas that require strengthening and to examine the need for aggregation and integration of multiple safety data sources that will lead to the development and implementation of data-based mitigation strategies.

3.2 An outcome of the recent High-level Safety Conference (2010) was a recommendation for States to support the holding of regional runway safety summits. ICAO is planning to organize a global runway safety symposium in 2011, in collaboration with international partners and stakeholders, which will assist in the initiation of these regional runway safety summits and in the implementation of effective changes.

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## APPENDIX

### DRAFT RESOLUTION FOR ADOPTION BY THE 37TH SESSION OF THE ASSEMBLY

#### **Resolution 30/1: Runway safety**

*Whereas* runway accidents constitute a large portion of all accidents and have resulted in a great number of fatalities;

*Whereas* runway excursions are the highest single occurrence category of all accidents over the last ten years for all commercial and general aviation operations of fixed-wing aircraft above 5 700 kg certified maximum take-off mass;

*Whereas* there are several areas of technological development underway in the aviation industry that show great promise in the prevention and mitigation of runway accidents and serious incidents;

*The Assembly:*

1. urges States to take measures to enhance runway safety, including the establishment of runway safety programmes that include at least regulators, aircraft operators, air navigation services providers, aerodrome operators and aircraft manufacturers to prevent and mitigate the effects of runway excursions, runway incursions and other occurrences related to runway safety; and
2. resolves that ICAO shall actively pursue runway safety using a multi-disciplinary approach.

#### **Associated Practices**

1. The runway safety programmes should include the creation of local runway safety teams that address prevention and mitigation of runway excursions, runway incursions and other occurrences related to runway safety.
2. The Council should further develop provisions to assist States in establishing runway safety programmes.
3. States should be encouraged to participate in global and regional seminars and workshops to exchange safety information and best practices on runway safety.

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