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Regional Aviation Safety Group - Pan America (RASG-PA)

WORKING PAPER

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Eighth Regional Aviation Safety Group — Pan America Annual Plenary Meeting (RASG-PA/8)
Medellin, Colombia, 25 June 2015

Agenda Item 5: **Safety Initiatives**
5.3 Other Safety Initiatives

RUNWAY EXCURSION MITIGATION

(Presented by the United States)

EXECUTIVE SUMMARY

There are various practices that an airport operator can implement to mitigate the risk of runway excursions, which are a common problem with aviation accidents. There are design practices (such as longitudinal grading, distance remaining signs, runway grooving and runway safety area enhancement) and operational practice measures (such as rubber removal) help to reduce the risk of runway excursions or the risk of personal injury and property damage when excursions occur.

Action:	Recommended actions for the meeting are included in Paragraph 4.
Strategic Objective:	• Safety
References:	• FAA Advisory Circular (AC) 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces • FAA Airport Design Advisory Circular (AC) 150/5300-13

1. Introduction

1.1 Runway excursions are a common problem with aviation accidents; therefore it is important for airport operators to create a safe environment on the airfield for aircraft to operate while minimizing the risks of excursion. Safe practices include both airfield infrastructure design and operational safety.

2. Discussion

2.1 *Rubber Removal:* Landing and braking aircraft will typically leave tire rubber embedded in any available surface voids. Rubber build-up negatively impacts aircraft braking action. Wet runway conditions also exacerbate aircraft braking action due to loss of pavement/tire friction. Monitoring surface friction is an important function for airport operators (FAA AC 150/5320-12). The four most popular methods of mitigating rubber build-up consist of water blasting, chemical removal, shot blasting and mechanical removal.

2.2 *Longitudinal Grading of Final ¼ of Runways*: Overshoot and undershoot are critical safety events to be mitigated. The first and last ¼ of longitudinal runway grade play an important safety role in mitigating such incidents. The grades maintained within these runway segments enhance the pilot's visibility and the performance of instrument approach systems. Physical characteristics, such as runway lights and aiming points are better acquired when the first and last ¼ of the runway grades are constructed within the standard parameters. Airport Design Advisory Circular AC 150/5300-13 clearly prescribes the appropriate runway longitudinal grade profile.

2.3 *Distance Remaining Signs:* Distance Remaining Signs (DRS) provide situational awareness for pilots to quickly determine the distance remaining after touchdown or during take-off operations. Pilots' ability to determine available runway length enables them to: execute safe deceleration during landing operations, accelerate, rotate and lift-off during take-off, or safely abort a take-off. DRS are shown in 1000' increments and designed with a number showing the distance left in thousands of feet. The installation of DRS plays an important role in mitigating excursions and incursion incidents.

2.4 *Runway Grooving:* Transverse grooves or channels (6mm x 6mm spaced at 38mm) in the runway pavement enables excessive water to quickly and safely be removed from the runway surface. The presence of grooves does not increase the frictional characteristics of the pavement, it can however, reduce the risk of hydroplaning. (FAA AC 15/5320-12)

2.5 *Runway Safety Areas and EMAS:* Runway Safety Area (RSA). A compliant or improved RSA will minimize personal injury and property damage during excursions. A RSA (common known as a runway end safety area [RESA] in ICAO terms) is a defined surface surrounding the runway that is prepared or suitable for reducing the risk of damage to aircraft in the event of undershoot or excursion. There are many methods used for RSA improvement: constructing a standard RSA, relocating or shifting a runway to establish the proper RSA dimension, the implementation of declared distances, and the implementation of engineered materials arresting systems (EMAS).

2.6 EMAS is a critical aspect of RSA Improvement and is often a feasible option when there is not enough available land for a standard RSA. Currently there are 83 EMAS installations at 53 airports in the U.S. with 15 planned installations at 12 more airports. EMAS has played a role in 9 aircraft that overran the runway and were safety arrested, resulting in a total 243 passengers and crew avoiding personal injury.

3. Conclusion

3.1 The FAA Office of Airports will continue to proactively use available resources and new technologies to enhance runway safety to mitigate excursions.

4. Recommended Actions

4.1 The Meeting is invited to:

a) note the contents of this paper; and

b) Consider adaptation or implementation of the technologies and/or processes discussed to address the on-going safety challenges faced by airports.

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