Managing the risk of runway excursions

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Agenda

- The issue
- ICAO Approach
- EASA Activities
- Next steps

The issue

- Southwest Airlines Flight 1248, 8/12/2005
- NTSB recommendation to FAA
  - *"Develop and issue formal guidance regarding standards and guidelines for the development, delivery and interpretation of runway surface condition reports (A-07-62)"*
- FAA initiated the Take-off and Landing Performance Assessment Advisory and Rulemaking Committee (TALPA ARC)

The issue

- Information on RWY surface condition
  - Subjective and based on individual
  - No standardized method of reporting
  - No actual relation with aeroplane performance data
  - Measurements of friction on contaminated runways by CFME unreliable

ICAO Approach

- ICAO Friction Task Force (FTF) took over TALPA ARC recommendations and developed the Global Reporting Format (GRF)
  - Amendment 13-B to ICAO Annex 14
  - Amendment 1 to ICAO Doc 9981 “PANS-Aerodromes”
  - Amendments to ICAO Annexes 3, 4, 6, 9, 10, 11, 15, PANS-ATM, PANS-OPS, PANS-ABC
- GRF will be applicable on 5 November 2020

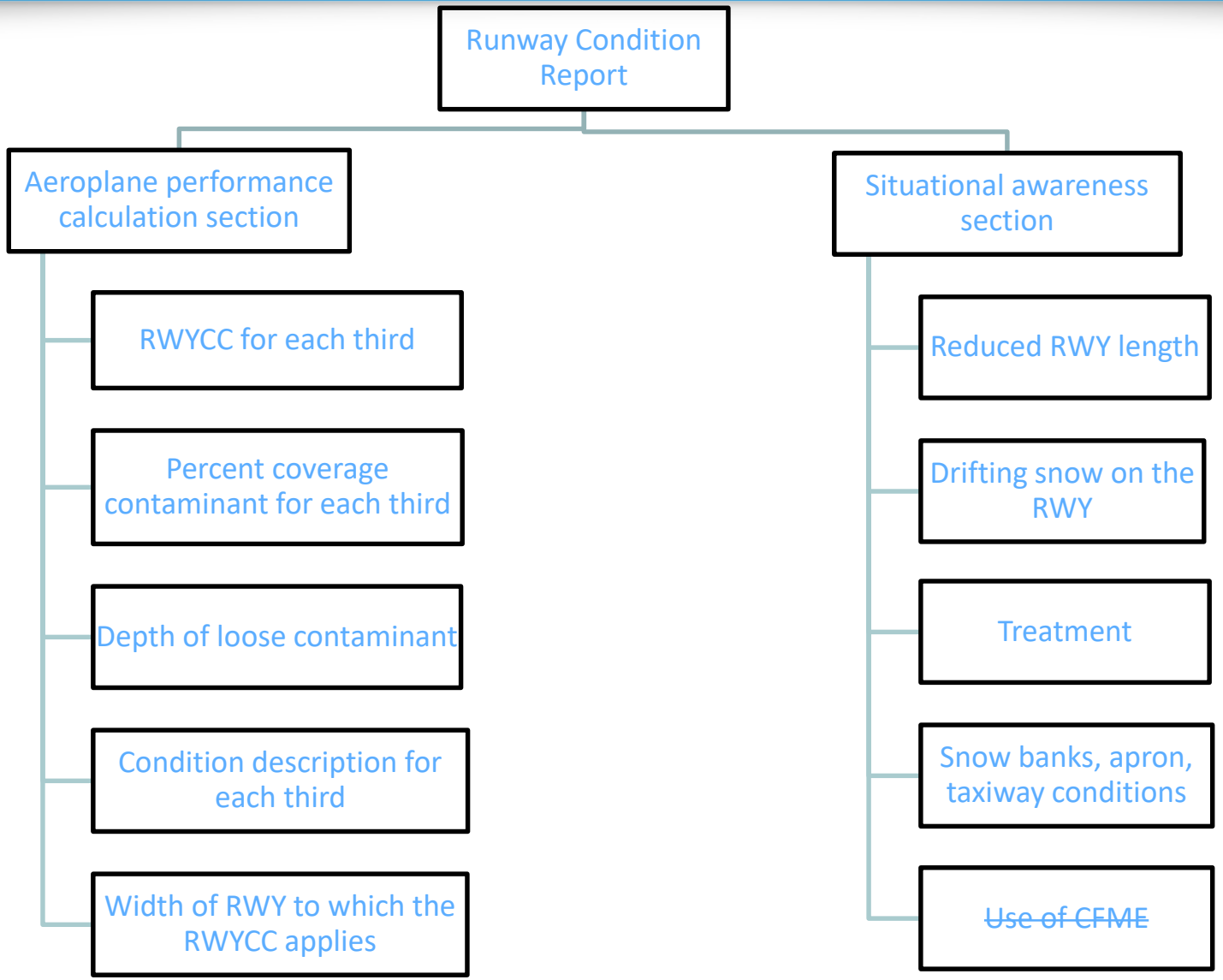
ICAO Approach

Table II-1-5. Runway condition assessment matrix (RCAM)

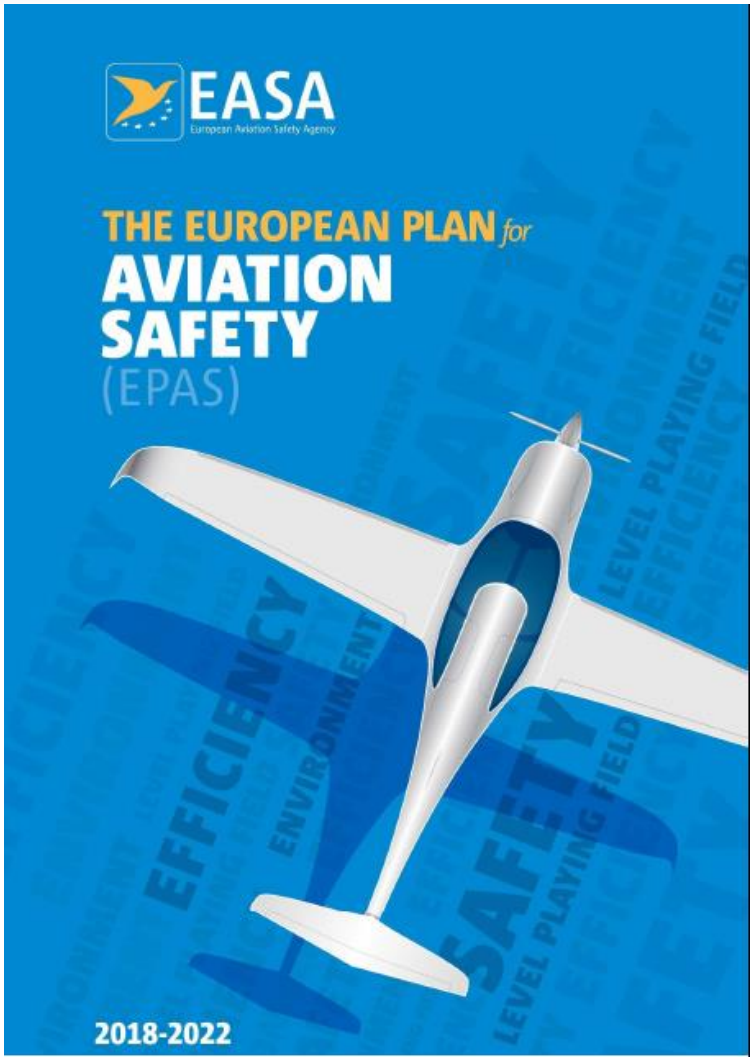
Runway condition assessment matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
6	• DRY	---	---
5	• FROST • WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth) *Up to and including 3 mm depth:* • SLUSH • DRY SNOW • WET SNOW	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	*−15ºC and Lower outside air temperature:* • COMPACTED SNOW	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	• WET ("slippery wet" runway) • DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW *More than 3 mm depth:* • DRY SNOW • WET SNOW *Higher than −15ºC outside air temperature*[1]: • COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	*More than 3 mm depth of water or slush:* • STANDING WATER • SLUSH	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE [2]	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	• WET ICE [2] • WATER ON TOP OF COMPACTED SNOW [2] • DRY SNOW or WET SNOW ON TOP OF ICE [2]	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

- RCAM
  - Basis for assessment and reporting
  - Used by both runway assessors and flight crews
  - Provides a 'common language'

ICAO Approach



EASA Activities



European Plan for Aviation Safety EPAS 2018–2022
Safety

5.3.2 Runway safety

Issue/rationale

This section deals both with Runway Excursions and Runway Collisions and is a strategic priority.

According to the definition provided by ICAO, an RE is a veer or overrun off the runway surface. RE events can happen during take-off or landing.. They account for 13% of the fatal accidents in CAT aeroplane operations involving airline/cargo operations in the past decade. This includes materialised runway excursions, both high and low speed and occurrences where the flight crew had difficulties maintaining the directional control of the aircraft or of the braking action during landing, where the landing occurred long, fast, off-centred or hard, or where the aircraft had technical problems with the landing gear (not locked, not extended or collapsed) during landing.

An Runway Incursions refers to the incorrect presence of an aircraft, vehicle or person on an active runway or in its areas of protection. Their accident outcome, runway collisions have been the outcome in 1% of fatal accidents in the past decade. Despite the low percentage, the risk of the reported occurrence demonstrated to be very real..

What we want to achieve

Continuously assess and improve risk controls to mitigate the risk of REs and RIs.

How we monitor improvement

Continuous monitoring of safety issues identified in the ATM and Aerodrome risk portfolio (currently under development)

EASA Activities

Rulemaking

Rulemaking

RMT.0296 **Review of aeroplane performance requirements for operations**

- Develop regulatory material to provide improved clarity, technical accuracy, flexibility or a combination of these benefits for the EU operational requirements on aeroplane performance in air operations with the aim of reducing the number of accidents and serious incidents where aeroplane performance is a causal factor; and
- Contribute to the harmonisation of the FAA and EU operational requirements on aeroplane performance in CAT operations.

Owner	Affected stakeholders
EASA FS.2	Aeroplane operators, manufacturers, Competent authorities

PIA	Proc	3rdC	ToR	NPA	Opinion	Commission IR	Decision
A-	ST	-	09/06/2015	30/09/2016	2018 Q2	2019 Q4	2019 Q4

RMT.0570 **Reduction of runway excursions**

The objective of this task is to increase the level of safety by reducing the number of REs through mandating existing technologies on aeroplane that allow to measure remaining runway left and thus support pilot-decision-making.
Due to the nature of the comments received on NPA 2013-09, EASA has decided to publish a new NPA on the reduction of REs. The proposal of the new NPA will put more emphasis on safety objectives against the risk of REs, while providing more flexibility in terms of design solutions. The means to achieve these objectives will be provided in a technical standard developed jointly by industry and NAAs with the support of an international standardisation body (EUROCAE).

Owner	Affected stakeholders
EASA CT.7	Operators, manufacturers, applicants for TC/STC

PIA	Proc	3rdC	ToR	NPA	Opinion	Commission IR	Decision
A-	ST	-	09/10/2012	10/05/2013	2018 Q4	2018 Q4	2018 Q4
				2018 Q1	n/a	n/a	2020 Q1

RMT.0703 **Runway safety**

European Action Plans for the Prevention of Runway Incursions (EAPPRI) and Excursions (EAPPRE) contain several recommendations to Competent Authorities, Aerodrome Operators and EASA in order to mitigate the risks.
In the aerodromes' domain, EASA had included in Regulation (EU) No 139/2014[10] and in the relevant AMC/GM and CS many of these recommendations, however there are some of them that have not been addressed.

Owner	Affected stakeholders
EASA FS.4.3	National Aviation Authorities, aerodrome operators

PIA	Proc	3rdC	ToR	NPA	Opinion	Commission IR	Decision
A1 to 2.5	ST	-	14/09/2017	2018 Q1	2019 Q1	2020 Q1	2020 Q1

RMT.0704 **Runway surface condition assessment and reporting**

Revision and update of Regulation (EU) No 139/2014 and of the related AMC and GM in order to include the changes in Annex 14 and PANS Aerodromes.

Owner	Affected stakeholders
EASA FS.4.3	Aerodrome operators, aircraft operators, GA, ANSPs, National Aviation Authorities

PIA	Proc	3rdC	ToR	NPA	Opinion	Commission IR	Decision
A2.5	ST	-	13/09/2017	2018 Q3	2019 Q1	2020 Q2	2020 Q2

RMT.0722 **Provision of aeronautical data by the aerodrome operator**

Owner	Affected stakeholders
EASA FS.4.3	

PIA	Proc	3rdC	ToR	NPA	Opinion	Commission IR	Decision
A2	ST	-	2018 Q3	2019 Q3	2020 Q2	2021 Q2	2021 Q2

EASA Activities

Safety promotion

Safety Promotion

MST.007 **Include runway excursions in national SSPs**

REs should be addressed by the MS on their SSPs in close cooperation with the aircraft operators, air traffic control, airport operators and pilot representatives. This will include as a minimum agreeing a set of actions and measuring their effectiveness. MS should implement actions suggested by the European Action Plan for the Prevention of Runway Excursions (EAPPRE) and monitor effectiveness.

Owner	Activity sector	Deliverable	Date
MS	CAT, HF	SSP established	Continuous

MST.014 **Include runway incursions in national SSPs**

RIs should be addressed by the MS on their SSPs. This will include as a minimum agreeing a set of actions and measuring their effectiveness. MS should implement actions suggested by the European Action Plan for the Prevention of Runway Incursions (EAPPRI).

Owner	Activity sector	Deliverable	Date
MS	CAT/GA, HF	SSP established	Continuous

EASA Activities

- Horizontal approach
  - Objective
    - Support pilot's decision making
  - How
    - Improve accuracy and timeliness of runway surface condition – RMT.0704
    - In-flight assessment of landing performance at the time of arrival in line with ICAO – RMT.0296
    - Technology – installation of runway overrun awareness and alerting system (ROAAS) – RMT.0570

EASA Activities

- Weak link
  - Accuracy of assessing runway surface conditions
- How we want to solve the issue
  - Standardized method of assessment based on ICAO
  - Specific training requirements for runway assessors
  - Improve accuracy of the assessment using technology
    - EUROCAE WG-109 ‘Runway weather information systems’

EASA Activities

- Utilization of CFME on contaminated runways
  - Two studies performed by the Agency
    - RuFAB – Runway friction characteristics measurement and aircraft braking
    - Use of CFME on dry and contaminated surfaces
  - Theoretical models in-place
  - Need for field trials to validate

Next steps

- RMT.0296
  - Publication of Opinion in Q1/2019
- RMT.0704
  - Publication of NPA in November 2018
  - Publication of Opinion in Q2/2019
- RMT.0570
  - NPA published October 2018
  - Publication of Opinion in Q1/2019

EASA
European Aviation Safety Agency

Thank you very much for your attention

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