

# Guidance Material, Measurement Tools and Future work GRF 2019

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Rapporteur ICAO Friction Task Force

# What this panel will cover

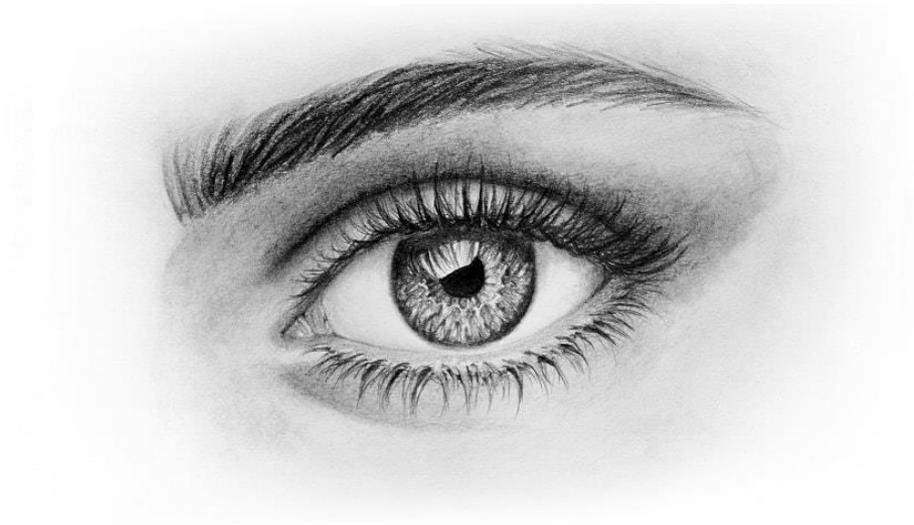
- Guidance Material
- Measurement tools
- Future work

# What this panel will cover

- Guidance Material
  - SARPs Standards and recommendations
  - PANS Procedures Attachment
  - Doc Guidance
  - Circular Concept
- Measurement tools
- Future work

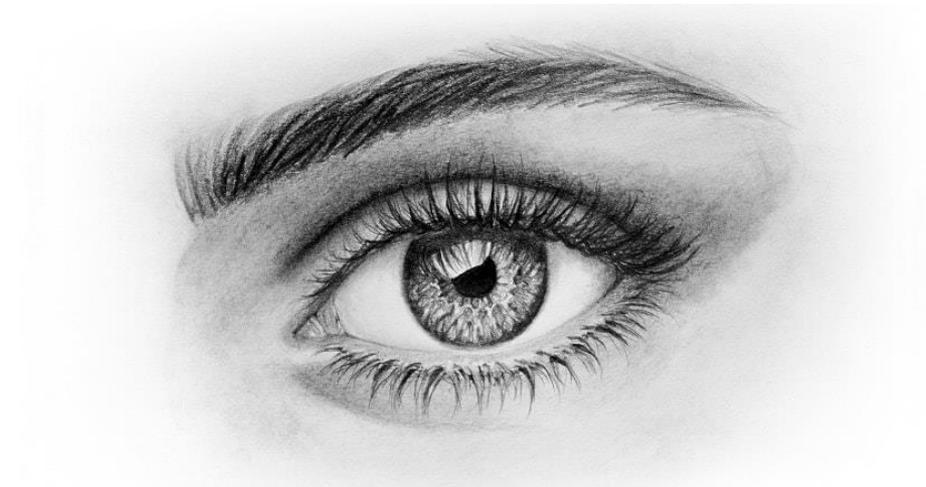
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- Guidance Material
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**Most important tool**

# What this panel will cover

- Guidance Material
- Measurement tools
- Future work



**Most important tool**

**Assessment**

# What this panel will cover

- Guidance Material
- Measurement tools
- Future work



Most important tool

Assessment

Measurements can be part  
of an assessment

# What this panel will cover

- Guidance Material
- Measurement tools
- Future work
  - Interoperability (SWIM)
  - How can we improve? Information from the aircraft

# You will find this in the PANS

## KEY IMPROVEMENT

Runway Condition Assessment Matrix (RCAM)			
Assessment Criteria		Downgrade Assessment Criteria	
Runway Condition Code	Runway Surface Description	Aeroplane Deceleration Or Directional Control Observations	Pilot Braking Action Advisory Report
6	• DRY	—	—
5	• FROST • WET (The runway surface is covered by any visible dampness or water less than 3 mm deep)  <i>Less than 2 mm depth:</i> • SLUSH • DRY SNOW • WET SNOW	Braking deceleration is normal for the visual braking effort applied AND directional control is normal.	GOOD
4	<i>-1°C and Lower outside air temperature:</i> • 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  <i>2 mm and more depth:</i> • DRY SNOW • WET SNOW  <i>Higher than -1°C outside air temperature:</i> • COMPACTED SNOW	Braking deceleration is noticeably reduced for the visual braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<i>2 mm and more depth of water or slush:</i> • STANDING WATER • SLUSH	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE <sup>1</sup>	Braking deceleration is significantly reduced for the visual braking effort applied OR directional control is significantly reduced.	POOR
0	• WET ICE <sup>2</sup> • WATER ON TOP OF COMPACTED SNOW <sup>2</sup> • DRY SNOW or WET SNOW ON TOP OF ICE <sup>2</sup>	Braking deceleration is minimal to non-existent for the visual braking effort applied OR directional control is nonexistent.	LESS THAN POOR

## *SNOWTAM*

- Single standardised reporting format
- Structured information according to pilots need

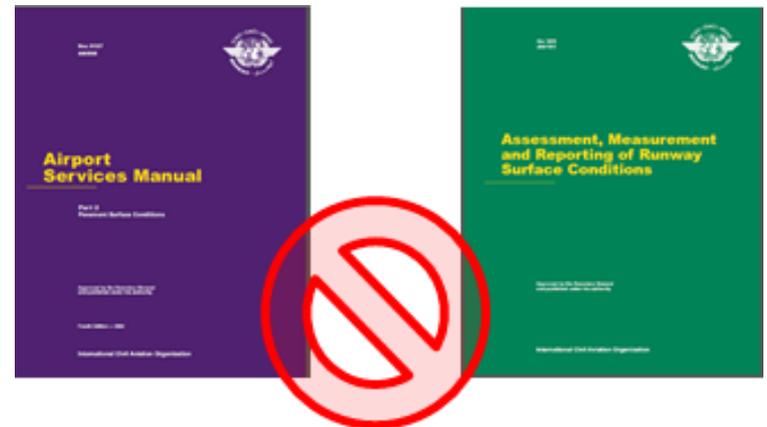
Written procedures

# Guidance material

- Guidance Material
  - PANS-Aerodromes Attachment A to Chapter 1
  - Doc 10064 (New) Aeroplane Performance Manual
  - Circular 355 (Revised) Assessment, Measurement and Reporting of Runway Surface Conditions

- Measurement tools

- Future work



## *Simplicity*

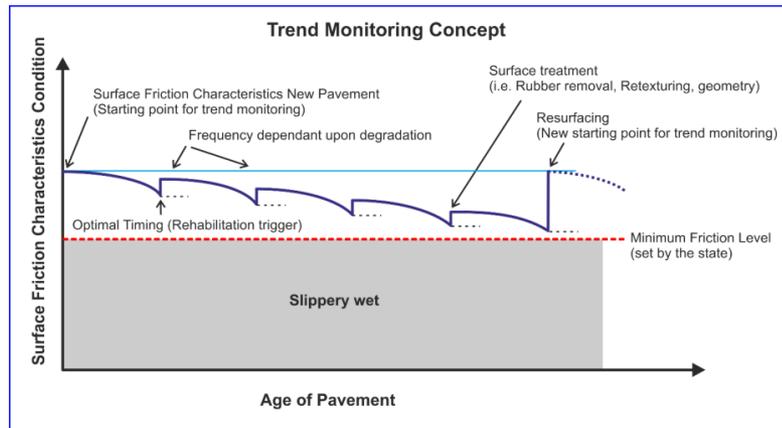
*The PANS gives you the  
procedures and the common  
language to be used*

# Methods of assessing runway surface conditions

## METHODS OF ASSESSING RUNWAY SURFACE CONDITION

		ANNEX 14, Volume I, 7th Edition, July 2016	REMARK
DESIGN AND CONSTRUCTION	Slope	3.1.13 Longitudinal slopes 3.1.19 Transverse slopes	
	Texture	3.1.26 <b>Recommendation.</b> —The average surface texture depth of a new surface should be not less than 1.0 mm.	
	Minimum friction level set by the State	3.1.23 A paved runway shall be so constructed or resurfaced as to provide surface friction characteristics at or above the minimum friction level set by the State.	The State set criteria for surface friction characteristics and output from State set or agreed assessment methods form the reference from which trend monitoring are performed and evaluated.
	Polishing	3.1.23 A paved runway shall be so constructed or resurfaced as to provide surface friction characteristics at or above the minimum friction level set by the State.	Polished Stone Value. (PSV-value) is a measure of skidding resistance on a small sample of stone surface, having being subjected to a standard period of polishing.

- Guidance in PANS-Aerodromes
  - Attachment A to Chapter 1



- Further refinement Ongoing activity

# Circular 355

## Gathering information



Circular 355  
AN/211

Assessment, Measurement and  
Reporting of Runway Surface  
Conditions

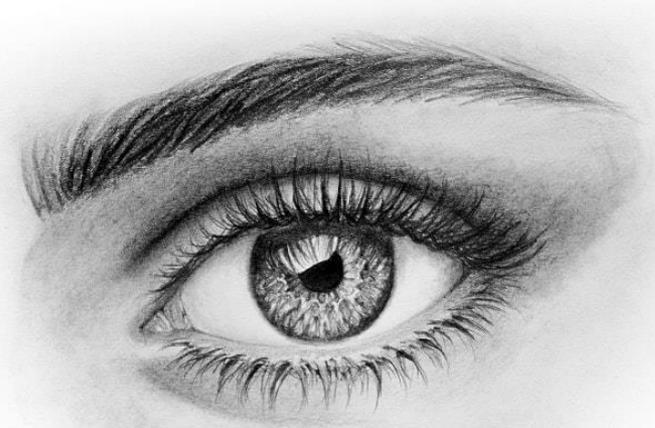
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Advance edition (unedited)

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INTERNATIONAL CIVIL AVIATION ORGANIZATION



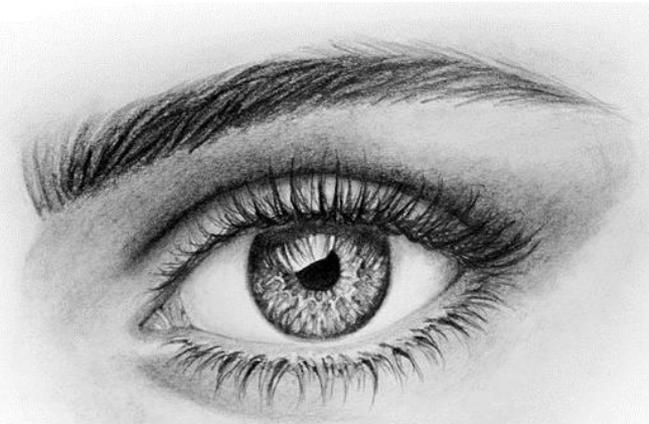
# Table 4-4. Source of information

RUNWAY CONDITION REPORT (RCR)	
Aeroplane performance calculation section	
Information	Source
Aerodrome location indicator	ICAO Doc 7910, <i>Location Indicators</i>
Date and time of assessment	UTC time
Lower runway designation number	Actual runway (RWY)
RWYCC for each runway third	Assessment based upon RCAM and associated procedures
Per cent coverage contaminant for each runway third	Visual observation for each runway third
Depth of loose contaminant for each runway third	Visual observation assessed for each runway third, confirmed by measurements when appropriate
Condition description (contaminant type) for each runway third	Visual observation for each runway third
Width of runway to which the RWYCCs apply if less than published width	Visual observations while at the RWY and information from local procedures/snow plan
Situational awareness section	
Reduced runway length	NOTAM
Drifting snow on the runway	Visual observation while at RWY
Loose sand on the runway	Visual observation while at RWY
Chemical treatment on the runway	Known treatment application. Visual observation of residual chemicals on the runway
Snowbanks on the runway	Visual observations while at the RWY
Snowbanks on taxiway	Visual observations while at the taxiway (TWY)
Snowbanks adjacent to the runway penetrating level/profile set in the aerodrome snow plan	Visual observations while at the RWY confirmed by measurements when appropriate
Taxiway conditions	Visual observation, AIREP, reported by other aerodrome personnel, etc
Apron conditions	Visual observation, AIREP, reported by other aerodrome personnel, etc
State approved and published use of measured friction coefficient	Dependent upon the State set or agreed standard
Plain language remarks using only allowable characters in capital letters	Any additional operational significant information to be reported

Visual observations

Most important tool

Assessment



# Table 4-4. Source of information

RUNWAY CONDITION REPORT (RCR)	
Aeroplane performance calculation section	
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Runway Condition Code (RWYCC) for each runway third

Runway Condition Assessment Matrix (RCAM)			
Assessment Criteria		Downgrade Assessment Criteria	
Runway Condition Code	Runway Surface Description	Aeroplane Deceleration Or Directional Control Observation	Pilot Braking Action Advisory Report
6	• DRY	---	---
5	• FROST • WET (The runway surface is covered by any visible dampness or water less than 3 mm deep)  <i>Less than 3 mm depth:</i> • SLUSH • DRY SNOW • WET SNOW	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	<i>-1.0°C and Lower outside air temperature:</i> • 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  <i>3 mm and more depth:</i> • DRY SNOW • WET SNOW  <i>Higher than -1.0°C outside air temperature:</i> • COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<i>3 mm and more depth of water or slush:</i> • STANDING WATER • SLUSH	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE <sup>2</sup>	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	• WET ICE <sup>2</sup> • WATER ON TOP OF COMPACTED SNOW <sup>2</sup> • DRY SNOW or WET SNOW ON TOP OF ICE <sup>2</sup>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

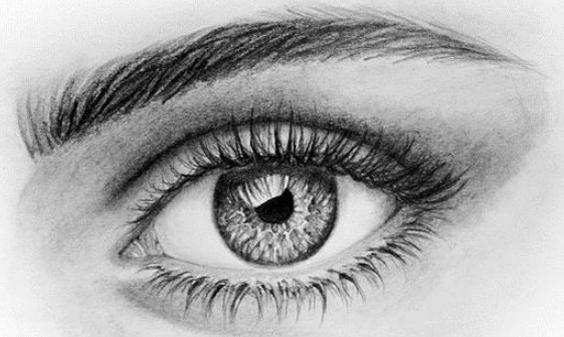
Written procedures

# RCAM

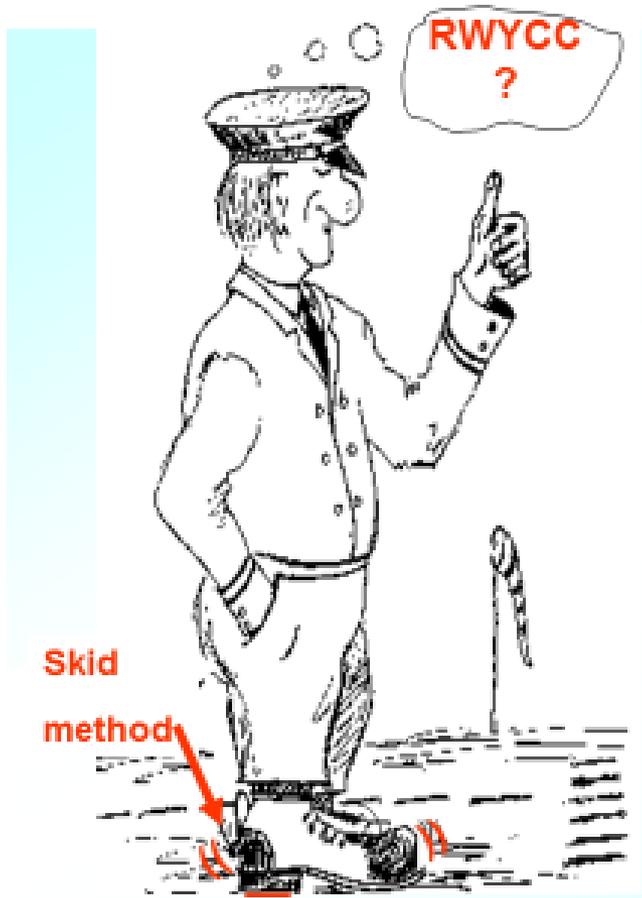
Table 4-2. Runway Condition Assessment Matrix (RCAM)

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	<ul style="list-style-type: none"> <li>• FROST</li> <li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li> </ul> <p><b>Up to and including 3 mm depth:</b></p> <ul style="list-style-type: none"> <li>• SLUSH</li> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul>	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	<p><b>-15°C and lower outside air temperature:</b></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	<ul style="list-style-type: none"> <li>• WET ("slippery wet" runway)</li> <li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li> </ul> <p><b>More than 3 mm depth:</b></p> <ul style="list-style-type: none"> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul> <p><b>Higher than -15°C outside air temperature<sup>1</sup>:</b></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p><b>More than 3 mm depth of water or slush:</b></p> <ul style="list-style-type: none"> <li>• STANDING WATER</li> <li>• SLUSH</li> </ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE <sup>2</sup>	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	<ul style="list-style-type: none"> <li>• WET ICE <sup>2</sup></li> <li>• WATER ON TOP OF COMPACTED SNOW <sup>2</sup></li> <li>• DRY SNOW or WET SNOW ON TOP OF ICE <sup>2</sup></li> </ul>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

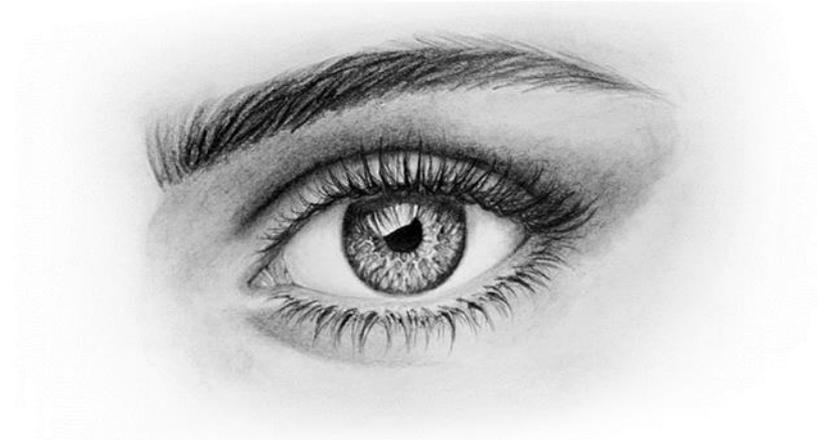
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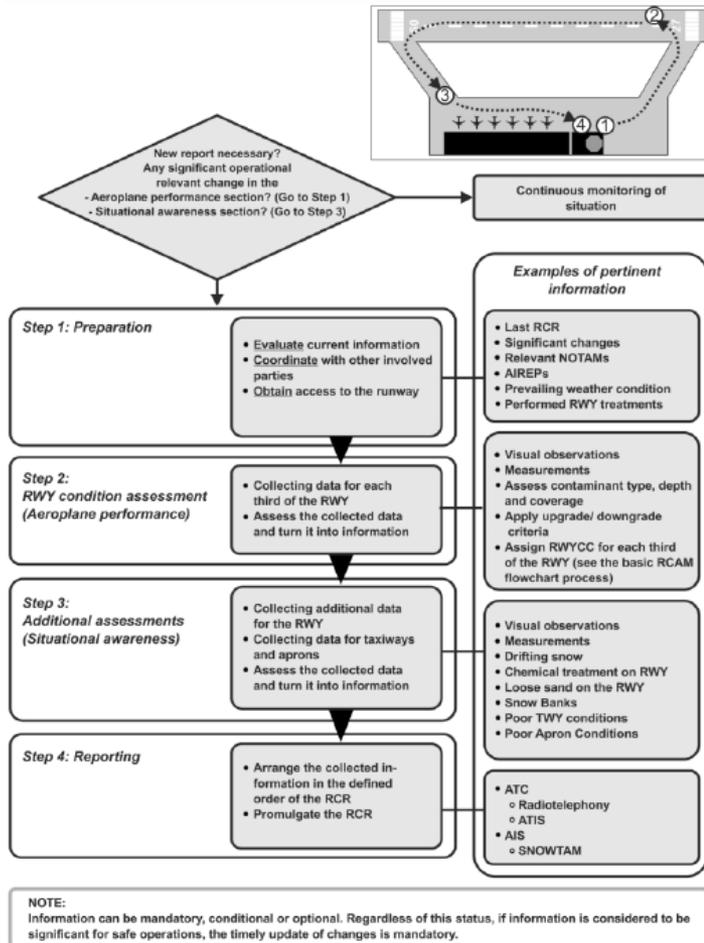
# Runway Condition Code



- Downgrading
- Upgrading
  - Make use of all information available to you



# Flowcharts



- Flowcharts guiding you through the RCAM procedures in order to arrive at a
- **RWYCC** to report via the
- **Runway Condition Report (RCR)**

*Simplicity*

# Runway Condition Report (RCR)



- 'Pilots eye'
  - on the ground
  - gathering structured information according to
- Pilots need
  - Performance calculations
  - Situational awareness

Using a **Common global language**