GLOBAL REPORTING FORMAT (GRF)
for **RUNWAY SURFACE CONDITIONS (RCR)**
CAAM'S MOVING FORWARD

[Problem Statement]

Runway Excursion

- Aviation's Number 1 – Safety Risk Category
- Among the top contributing factors are poor braking action due to contaminated runways combined with shortfalls in the accuracy and timeliness of assessment and reporting of the runway surface conditions.

GLOBAL REPORTING FORMAT - RUNWAY CONDITION REPORT (GRF-RCR)

No.	Contents
1.	What is Runway Condition Report (RCR)?
2.	Objectives of Runway Condition Report (RCR)
3.	Benefits
4.	Why is the Runway Condition Report (RCR) important?
5.	The Main Agencies Roles
6.	Implementation Challenges
7.	Roles by Agencies (Airport Operator, Regulator & Airlines)
8.	ICAO Provision & Guidance Material

What is Runway Condition Report (RCR)?

A Standard Reporting of Runway Surface Condition

Procedure: Reporting in one system/platform

Applicable : 5 November 2020

The related parties involved: Aerodrome operator, aircraft operators, pilots, ATC, AIM, MET & Aircraft Manufacturers

Objectives of Runway Condition Report (RCR)

Objectives

1. Assessing and reporting the condition of the movement area

2. Providing the assessed information in the correct format

3. Reporting significant changes without delay

Benefits

Improved safety

- Better understanding of runway conditions.
- Fewer runway excursions.

Improved efficiency

- Flight crews can better correlate reported runway surface conditions to contaminated landing and take-off performance data
- Airport operators have an objective method of reporting runway surface conditions to flight crews.

Why is the Runway Condition Report (RCR) important?

1. To standardize the Reporting of Runway Surface Condition
2. Establish a common language between all related parties in airports with one system (AD Operator, Aircraft Operators, Pilots, ATC, AIM, MET, etc)
3. Allow pilots to accurately determine aeroplane take-off and landing performance
4. Improve aerodrome safety >> better understanding of RWY condition & fewer RWY excursion
5. Improved airport operations efficiency >> better decision making
6. Reduced environment impact >> better traffic management





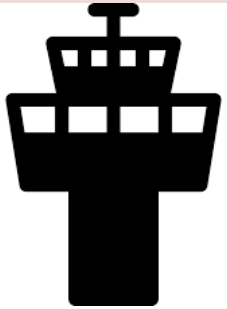

The Main Agencies Roles

Airports

- Assess the RWY Condition and Report using RCR

ATS/AIS

- Convey Information from RCR to Aircraft Operators



Pilots

- Use information with aircraft performance data to determine if landing or take-off is safe

The Airport's Operator Roles

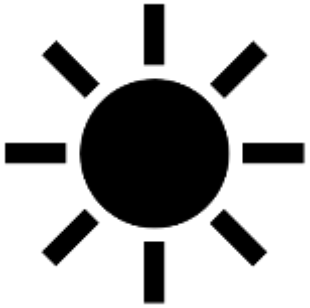
AIRPORTS

1

Exposed to snow and ice

Need to use the full global reporting format

Two Scenarios



2

Not exposed to snow and ice

Use only the section of the global reporting format related to water as contaminant

Examples

Step 1

% Coverage of contaminant
Depth of contaminant
Type of contaminant

Step 2

% Coverage of contaminant
Depth of contaminant
Type of contaminant

Step 3

% Coverage of contaminant
Depth of contaminant
Type of contaminant

1st

2nd

3rd

% COVERAGE	RANGE
Not Reported	Less than 10 %
25 %	10 % - 25 %
50 %	26 % - 50 %
75 %	51 % - 75 %
100 %	76 % - 100 %

Runway 15/33, klia2

The Airport's Operator Roles

Sample Reporting Worksheet - ACI

Runway Condition Assessment Worksheet

Aerodrome

Date/Time (UTC) of assessment (MMDDhhmm)

Lower Runway Designator

°C Outside Air Temperature

Initials

Assess the % coverage of runway contamination for each runway third

- < 10% coverage — RWYCC - 6 for that third. No contaminant is reported
- ≥ 10% - ≤ 25% coverage — RWYCC - 6 for that third. Report contaminant at 25% coverage
- > 25% coverage — Assign RWYCC based on contaminant present & temperature considerations

NOTE: RCR not required if all RWY thirds have <10% coverage (unless making a final report to advise the RWY is no longer contaminated)

1st RWY Third / **2nd RWY Third** / **3rd RWY Third**

For coverage 25% or less enter Code 6

- Identify any contaminant that covers more than 25% of the RWY third
- Identify % coverage
- Identify depth (if applicable)
- Identify Runway Condition Code
- Record the most restrictive code in the box to the right

RWYCC

Dry	Wet (Damp)	Frost	Slippery Wet (Below Min Friction Level Classification)
6	5	5	3
	% Cov. 25/50/75/100	% Cov. 25/50/75/100	% Cov. 25/50/75/100

Standing Water/ Slush	Slush	Wet snow or Dry snow		Dry or wet snow on compacted snow
2	5	3	5	3
>3mm	3mm or less	>3mm	3mm or less	
% Cov. 25/50/75/100	% Cov. 25/50/75/100	% Cov. 25/50/75/100		% Cov. 25/50/75/100

Depth: 3mm or less | Assessed depth (mm):

Mark depth only for: Standing Water, Slush, Wet or Dry Snow. Any snow on top of compacted snow

-15°C or below		Above -15°C	
% Cov. 25/50/75/100	4 Compacted snow	3	% Cov. 25/50/75/100

Ice		Wet Ice, Water on compacted snow, snow on Ice	
% Cov. 25/50/75/100	1	0	% Cov. 25/50/75/100

Situational Awareness Section

- RWY Reduced length — LDA ____ m
- RWY Drifting snow — RWY Loose sand
- RWY Snowbanks L of CL ____ m / R of CL ____ m
- TWY Snowbanks L of CL ____ m / R of CL ____ m
- Asymm. reduced RWY width R/L ____ m FM CL
- TWY ____ Poor
- Apron ____ Poor
- Other ____

RWY Treatment Used? Time Applied: ____

Chem. Treatment — Liquid / Solid; Plowed; Swept; Sanded; Scarified

Notes

State approved CFME Braking coefficient

MU not to be transmitted in RWY Condition Report

Adjusted RWYCC

ONLY if Downgrade/ Upgrade Assessments used

Downgrade/ Upgrade Criteria: AIREP / CFME / Other

RCR ____ Aerodrome ____ Date & Time ____ RWY ____ RWYCC ____ % Coverage ____ Depth in mm

Contaminant Type 1st third / Contaminant Type 2nd third / Contaminant Type 3rd third

Plain language remarks

Reduced RWY width in m (if applicable)

Runway Condition Assessment Matrix (RCAM)

(For Dry, Wet & Standing Water only)

(1.1.3.14) An assigned RWYCC 5, 4, 3 or 2 shall not be upgraded. Only assigned RWYCC 1 & 0 can be upgraded.

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	• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4		Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	• WET ("slippery wet" runway)	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	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0		Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

Runway Condition Assessment Matrix (RCAM)

(FULL VERSION)

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	***−15°C 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 −15°C outside air temperature***[1]: • COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM

Runway Condition Assessment Matrix (RCAM)

(FULL VERSION)

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Assessment criteria		Downgrade assessment criteria	
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
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 −15°C 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

Information Strings

Information Strings

The information to be reported shall be compliant with the RCR which consists of:

1. *Aeroplane performance calculation (APC) section*
2. *Situational awareness (SA) section*

Information Strings

The information to be reported shall be compliant with the RCR which consists of:

a) Aeroplane performance calculation section (APC)

b) Situational awareness section (SA)

Example SNOWTAM 4

DOC 10066 – PANS AIM

GG EADBZQZX EADNZQZX EADSZQZX
170350 EADDYNYX
SWEA0152 EADD 02170345
(SNOWTAM 0152
EADD
02170345 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/SLUSH
02170134 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH
02170225 09C 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW 35

} ***FOR 3 RUNWAYS***

DRIFTING SNOW. RWY 09L LOOSE SAND. RWY 09R CHEMICALLY TREATED. RWY 09C CHEMICALLY TREATED.)

APC

SA

RCR Information Strings

AEROPLANE PERFORMANCE CALCULATION SECTION (8)		
✓ 1	aerodrome location indicator	M
✓ 2	date and time of assessment	M
✓ 3	lower runway designation number	M
✓ 4	RWYCC for each runway third	M
✓ 5	per cent coverage contaminant for each runway third (NR if dry/<10%)	C
✓ 6	depth of loose contaminant for each runway third (only if STANDING WATER)	C
✓ 7	condition description for each runway third; and	M
✓ 8	width of runway to which the RWYCCs apply if less than published width.	O

RCR Information Strings

SITUATIONAL AWARENESS SECTION (11)		
1	reduced runway length (when NOTAM published with new declared distances affecting LDA)	C
2	drifting snow on the runway	O
3	loose sand on the runway	O
4	chemical treatment on the runway	M
5	snowbanks on the runway	O
6	snowbanks on the taxiway	O
7	snowbanks adjacent to the runway	O
8	taxiway conditions	O
9	apron conditions	O
10	State-approved, and published use of, measured friction coefficient; and	O
11	plain language remarks.	O

Information Strings (e.g.)

a) Aeroplane performance calculation section

1 - Aerodrome location indicator	2 - Date and time of assessment	3 - Lower runway designation number	4 - RWYCC for each runway third	5 - % coverage contaminant for each runway third *	6 - Depth of loose contaminant for each runway third
WMKK	09251400	14L	5/5/2	50/50/50	NR/NR/04

* Refer next slide

WET/WET/STANDING WATER

7 – Condition description for each runway third

8 – Width of cleared runway in metres to which the RWYCCs apply if less than published width

WMKK 09251400 14L 5/5/2 50/50/50 NR/NR/04
WET/WET/STANDING WATER

5 - Percentage Coverage of Contaminant (e.g)

Format: [n]nn/[n]nn/[n]nn
Example: 25/50/100
NR/50/100 if contaminant coverage is less than 10% in the first third
25/NR/100 if contaminant coverage is less than 10% in the middle third
25/50/NR if contaminant coverage is less than 10% in the last third

Table II-1-1. Percentage of coverage for contaminants

Assessed per cent	*Reported per cent*
10 – 25	25
26 – 50	50
51 – 75	75
76 – 100	100

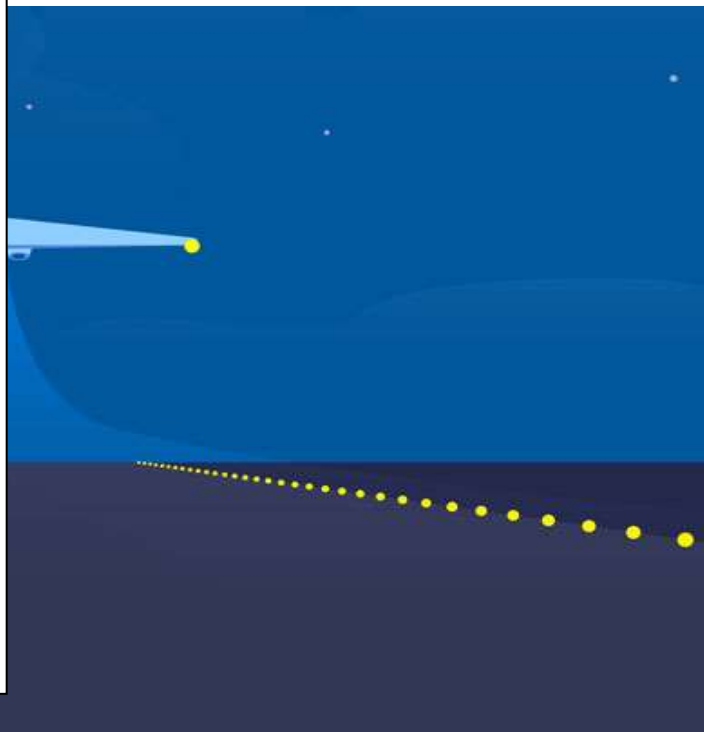
WMKK 09251400 14L 5/5/2 50/50/50 NR/NR/04
WET/WET/STANDING WATER

Information Strings

b) Situational awareness section (e.g.)

1 RWY 22L LDA REDUCED TO 1450. 2 DRIFTING SNOW. 3 TWY B POOR. 4 APRON NORTH POOR.

SITUATIONAL AWARENESS SECTION		
1	reduced runway length (when NOTAM published with new declared distances affecting LDA) ①	C
2	drifting snow on the runway ②	0
3	loose sand on the runway	0
4	chemical treatment on the runway	M
5	snowbanks on the runway	0
6	snowbanks on the taxiway	0
7	snowbanks adjacent to the runway	0
8	taxiway conditions ③	0
9	apron conditions ④	0
10	State-approved, and published use of, measured friction coefficient; and	0
11	plain language remarks.	0



New SNOWTAM Format (Doc 10066)

Doc 10066

Appendix 4. SNOWTAM FORMAT

(See Chapter 5, 5.2.5.1.4)

(applicable as of 5 November 2020)

(COM heading)	(PRIORITY INDICATOR)	(ADDRESSES)	<≡
	(DATE AND TIME OF FILING)	(ORIGINATOR'S INDICATOR)	<≡
(Abbreviated heading)	(SWAA* SERIAL NUMBER) S W * *	(LOCATION INDICATOR)	DATE/TIME OF ASSESMENT / (OPTIONAL GROUP) <≡(

SNOWTAM →	(Serial number) <≡

Aeroplane performance calculation section			
(AERODROME LOCATION INDICATOR)	M	A)	<≡
(DATE/TIME OF ASSESSMENT *(Time of completion of assessment in UTC)*)	M	B)	→
(LOWER RUNWAY DESIGNATION NUMBER)	M	C)	→
(RUNWAY CONDITION CODE (RWYCC) ON EACH RUNWAY THIRD) *(From Runway Condition Assessment Matrix (RCAM) 0, 1, 2, 3, 4, 5 or 6)*	M	D)	/ / →
(PER CENT COVERAGE CONTAMINANT FOR EACH RUNWAY THIRD)	C	E)	/ / →
(DEPTH *(mm)* OF LOOSE CONTAMINANT FOR EACH RUNWAY THIRD)	C	F)	/ / →
(CONDITION DESCRIPTION OVER TOTAL RUNWAY LENGTH) *(Observed on each runway third, starting from threshold having the lower runway designation number)* COMPACTED SNOW DRY DRY SNOW DRY SNOW ON TOP OF COMPACTED SNOW DRY SNOW ON TOP OF ICE FROST ICE SLUSH STANDING WATER WATER ON TOP OF COMPACTED SNOW	M	G)	/ /

New SNOWTAM Format (Doc 10066)

FROST ICE SLUSH STANDING WATER WATER ON TOP OF COMPACTED SNOW WET WET ICE WET SNOW WET SNOW ON TOP OF COMPACTED SNOW WET SNOW ON TOP OF ICE			→
(WIDTH OF RUNWAY TO WHICH THE RUNWAY CONDITION CODES APPLY, IF LESS THAN PUBLISHED WIDTH)	O	H)	<==
Situational awareness section			
(REDUCED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH *(m)*)	O	I)	→
(DRIFTING SNOW ON THE RUNWAY)	O	J)	→
(LOOSE SAND ON THE RUNWAY)	O	K)	→
(CHEMICAL TREATMENT ON THE RUNWAY)	O	L)	→
(SNOWBANKS ON THE RUNWAY) *(If present, distance from runway centre line (m) followed by "L", "R" or "LR" as applicable)*	O	M)	→
(SNOWBANKS ON A TAXIWAY)	O	N)	→
(SNOWBANKS ADJACENT TO THE RUNWAY)	O	O)	→
(TAXIWAY CONDITIONS)	O	P)	→
(APRON CONDITIONS)	O	R)	→
(MEASURED FRICTION COEFFICIENT)	O	S)	→
(PLAIN-LANGUAGE REMARKS)	O	T)	)

NOTES:
1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2 or otherwise applicable aerodrome identifier.
2. Information on other runways, repeat from B to H.
3. Information in the situational awareness section repeated for each runway, taxiway and apron. Repeat as applicable when reported.
4. Words in brackets ( ) not to be transmitted.
5. For letters A) to T) refer to the *Instructions for the completion of the SNOWTAM Format*, paragraph 1, item b).

SIGNATURE OF ORIGINATOR *(not for transmission)*

Implementation Challenges

1. The RCR should contain all necessary information for the determination of relevant runway condition for the performance assessment of the flight crew/pilot

2. Aerodrome personnel should have the skill and knowledge to assess the condition of runway and produce accurate RWYCC

3. Coordination with relevant parties

4. The establishment of Malaysia Standard Reporting Format

5. ➢Training to related parties:
   - ➢1- Different level of experience and exposure
   - ➢2- Reluctant to give up methods and practices used for many years
   - ➢3- Management of change
   - ➢4- How to ensure accurate assessment at busy RWY

Roles by Agencies (Aerodrome Operator, Regulator & Airlines)

AERODROME OPERATORS

- Assess the runway surface conditions, including contaminants, for each third of Runway length, and report them by means of a uniform Runway Condition Report (RCR)
- To deploy GRF for Runway surface condition
- To provide technical training to AD staff

AERONAUTICAL INFORMATION SERVICES (AIS)

- Provide the information received in the RCR to end users

AIRCRAFT OPERATORS

- Utilize the information in conjunction with the performance data provided by aircraft manufacturers to determine if landing or take off operations can be conducted safely and provide runway braking action special air-reports (AIREP)

AIR TRAFFIC SERVICES

- Convey the information received via the RCR and/or special air-reports (AIREP) to end users (voice communication, ATIS)

AIRCRAFT MANUFACTURER

- Provide the necessary performance data in the aeroplane flight manual

ICAO Provision & Guidance Material

Annex 6

Part 2 Aeroplane Performance Manual (Doc 10064)

- New assessment by the pilot-in-command of the landing performance and report for commercial air transport operations

Annex 14, Vol. I

(Applicability 5 November 2020)

- Fundamental provisions for assessing and reporting runway surface conditions
- PANS-Aerodromes (Doc 9981)
- Assessment, Measurement and Reporting of Runway Surface Conditions (Circular 355)–*Revised Circular 329*
- PANS-ATM (Doc 4444)

Annex 8

- Nature of the information provided by the aircraft manufacturers

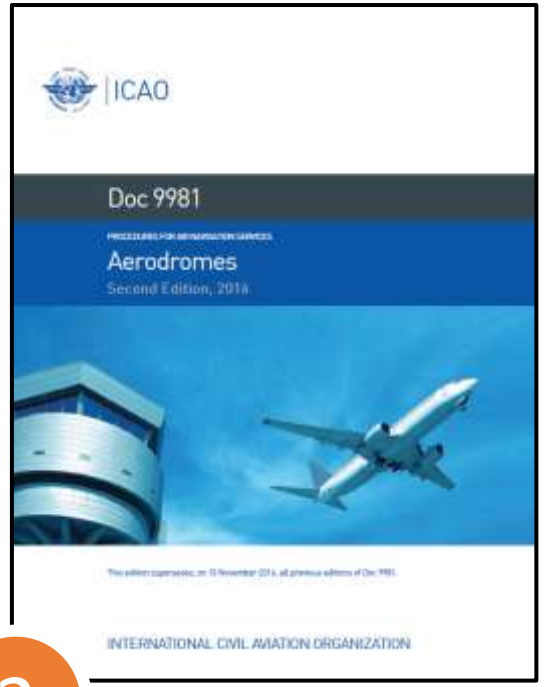
Annex 15

- Syntax and format used for dissemination
- PANS-AIM (Doc 10066) - New

ICAO Provision & Guidance Material

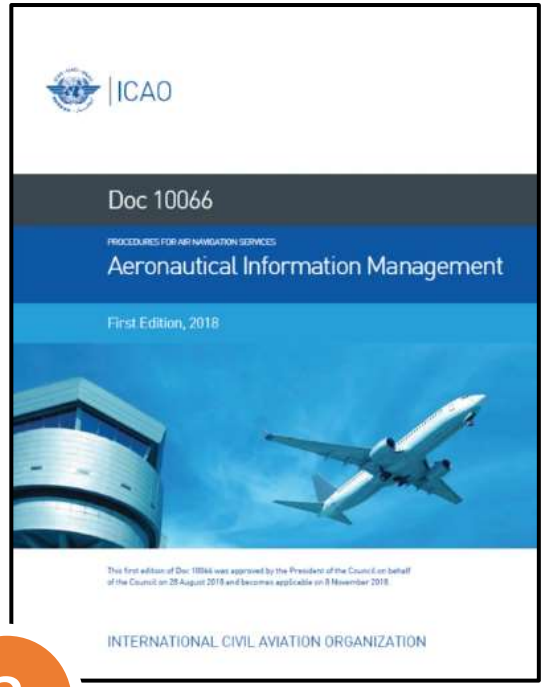
1

ICAO Annex 14, Vol.1
– Aerodrome Design and Operations



2

ICAO Doc 9981
– PANS Aerodrome



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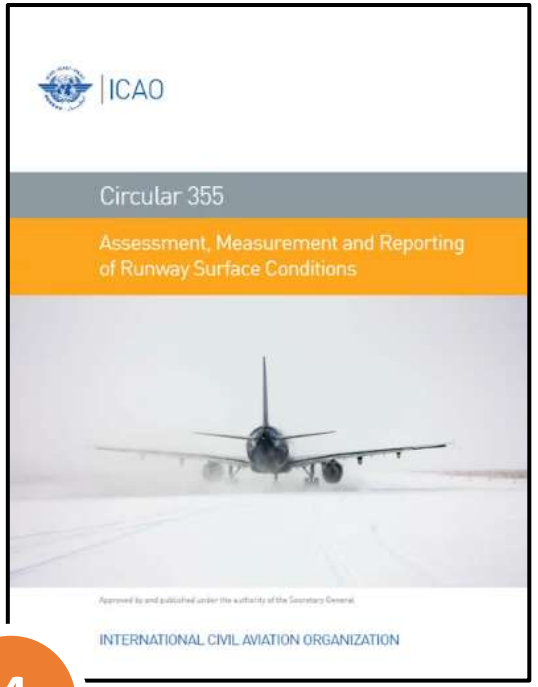
ICAO Doc 10066
– Aeronautical Information Management



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ICAO Circular 355
– Assessment, Measurement and Reporting of Runway Surface Conditions

CAAM
Civil Aviation Authority of Malaysia

MALAYSIA AIRPORTS