

Advisory Circular

Global Reporting Format (GRF) for Runway Surface Conditions

GENERAL.....	1
PURPOSE	1
APPLICABILITY	1
RELATED REGULATIONS	1
RELATED ADVISORY CIRCULARS	1
CANCELLATION.....	1
EFFECTIVE DATE.....	2
OTHER REFERENCES	2
1 INTRODUCTION	3
2 FLOW OF INFORMATION.....	4
3 COLLECTION OF INFORMATION.....	5
4 DISSEMINATION OF INFORMATION	6
5 USING THE INFORMATION.....	8

GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 3C of the Air Navigation Act (Cap. 6) (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This AC provides guidance to demonstrate compliance with, and information related to, the new ICAO methodology for assessing and reporting runway surface conditions, commonly known as the Global Reporting Format (GRF).

APPLICABILITY

This AC is applicable to the following:

- a pilot in command of an aeroplane operated by a holder of an air operator certificate issued under the Air Navigation (119 – Air Operator Certificate) Regulations 2018 (ANR-119);
- a pilot in command of a Singapore registered aircraft that has an MCTOM exceeding 5,700kg or is equipped with at least one turbine engine; and
- a holder of an air operator certificate issued under the ANR-119.

RELATED REGULATIONS

This AC relates specifically to Regulations 48A and 61 of the Air Navigation (91 – General Operating Rules) Regulations (ANR-91).

RELATED ADVISORY CIRCULARS

Nil.

CANCELLATION

This is the first AC issued on the subject.

EFFECTIVE DATE

This AC is effective from 4 November 2021.

OTHER REFERENCES

- ICAO Circular 355, *Assessment, Measurements and Reporting of Runway Surface Conditions*
- ICAO Doc 10064 *Aeroplane Performance Manual*
- PANS Aerodromes (Doc 9981)
- PANS Aeronautical Information Management (Doc 1006)
- PANS Air Traffic Management (Doc 4444)
- UK CAA CAP2174

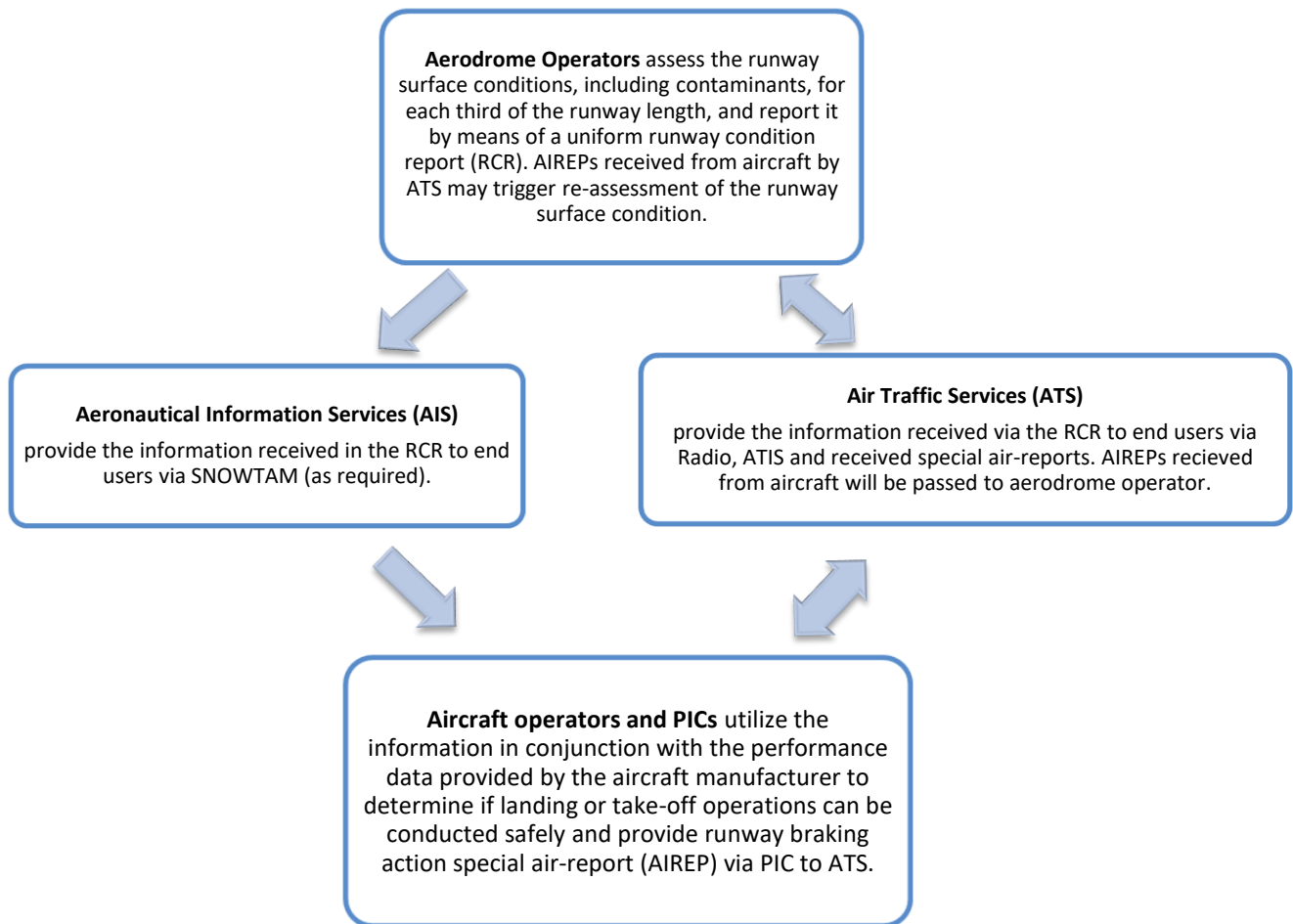
1 INTRODUCTION

- 1.1 Runway excursion has always been a top aviation safety risk. Analysis has shown that poor braking action due to contaminated runways, combined with shortfalls in the accuracy and timeliness of assessment and reporting of the runway surface conditions, are among the top contributing factors.
- 1.2 To address the issue, the ICAO Friction Task Force developed a new global reporting system for assessing and reporting runway surface conditions, known as the Global Reporting Format (GRF), to enable the harmonised assessment and reporting of runway surface conditions and rapid removal of contamination from the runway surfaces.
- 1.3 A fundamental feature in the new GRF is the introduction of a Runway Condition Report (RCR) which contains a unique Runway Condition Code (RWYCC), including contaminants, for each third of runway length. The assessment process of assigning a RWYCC is a deterministic process involving multiple stakeholders, starting with the identification of the various contaminants, that determines what initial RWYCC must be reported. Based on all other information available, this initial RWYCC can subsequently be downgraded or upgraded accordingly.
- 1.5 There are two scenarios. A State may:
 - a) Not be exposed to snow or ice and therefore have no need to use the full global reporting format other than for water; or
 - b) Be fully prepared to use the global reporting format (fully equipped, fully trained).

Note: As not all States have adopted the GRF, the operator must comply with the requirements of the respective State AIP.
- 1.7 The new GRF procedures including the new SNOWTAM format comes into effect from 4 November 2021 at 0000 UTC.

2 FLOW OF INFORMATION

2.1 The figure below illustrates the GRF flow of information and the roles of various parties.



3 COLLECTION OF INFORMATION

The aerodrome operator is responsible for assessing the condition of the runway for each third of the runway and issuing the RCR. This report contains the RWYCC and information which describes the runway surface condition, type of contamination, depth, coverage for each third of the runway, etc., and contains other relevant information.

This code is derived from the Runway Condition Assessment Matrix (RCAM) and associated procedures for downgrading and upgrading.

The RCAM is matrix allowing the assessment of the runway condition code, using associated procedures, from a set of observed runway surface condition(s) and pilot report of braking action. A sample RCAM is shown below, highlighting conditions that are applicable in Singapore.

Runway Condition Assessment Matrix (RCAM)			
Assessment		Downgrade Assessment Criteria	
Runway Condition Code	Runway Surface Description <i>*Applicable to Singapore Aerodromes</i>	Aeroplane Deceleration or Directional Control Observation	Pilot Report of Runway Braking Action
6	<ul style="list-style-type: none"> • Dry* 	---	---
5	<ul style="list-style-type: none"> • WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)* • FROST <p>Up to and including 3 mm depth:</p> <ul style="list-style-type: none"> • SLUSH • DRY SNOW • WET SNOW 	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	<p>-15°C and lower outside air temperature:</p> <ul style="list-style-type: none"> • COMPACTED SNOW 	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	<ul style="list-style-type: none"> • WET ("slippery wet" runway)* • DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW <p>More than 3 mm depth:</p> <ul style="list-style-type: none"> • DRY SNOW • WET SNOW <p>Higher than -15°C outside air temperature:</p> <ul style="list-style-type: none"> • COMPACTED SNOW 	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p>More than 3 mm depth of water or slush:</p> <ul style="list-style-type: none"> • STANDING WATER* • SLUSH 	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	<ul style="list-style-type: none"> • ICE 	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"> • WET ICE • WATER ON TOP OF COMPACTED SNOW • DRY SNOW or WET SNOW ON TOP OF ICE 	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

4 DISSEMINATION OF INFORMATION

- 4.1 In Singapore, AIS and ATS will provide the information received in the RCR to end users through ATIS, Radio Telephony and SNOWTAM.

Note – Details of the new SNOWTAM format are contained in the Procedures for Air Navigation Services (PANS) — Aeronautical Information Management (PANS-AIM, Doc 10066). Additional information on the SNOWTAM format can be found in the ICAO EUR/NAT Guidance on the Issuance of SNOWTAM.

- 4.2 Only RWYCC / Surface Descriptions **6 (Dry)**, **5 (Wet)**, **3 (Slippery Wet)** and **2 (Standing Water more than 3 mm)** are applicable.
- 4.3 The below table illustrates the expected channels of communication for the RCR used in Singapore for each RWYCC.

RWYCC (Surface Description)	RT	ATIS	SNOWTAM
6 (Dry)	Yes*	No	No**
5 (Wet)	Yes	Yes	No**
3 (Slippery Wet)	Yes	Yes	No**
2 (Standing Water more than 3 mm)	Yes	Yes	Yes

* If upgraded from RWYCC ≤ 5 upon request

** If triggered (RWYCC 2), reported until RWY CC 5/6 is issued and remains until expiry (+8 hours)

- 4.4 RCR Report:

The RCR is a comprehensive standardised report relating to runway surface conditions and its effect on the aeroplane landing and take-off performance.

Sample Runway Condition Report (RCR):

WSSS¹ 03310100² 02L³ 6/5/2⁴ NR/50/50⁵ NR/NR/05⁶ DRY/WET/STANDING WATER⁷ *

¹ Aerodrome Location Indicator

² MMDDhhmm Date and UTC time of assessment

³ Lower runway designation number

⁴ Runway condition code for each runway third, as seen in the direction of travel from the lower designation number

⁵ Percentage coverage by contaminant for each runway third (NR: not reported, if contaminant coverage is less than 10%)

⁶ Depth of contaminant in mm for each runway third (NR: not reported, if depth of water is 3 mm or less)

⁷ Condition description for each runway third

* Situational Awareness section containing other relevant information may be appended to the RCR such as reduced runway length, taxiway and/or apron conditions etc.

4.5 ATIS Report:

The RCR elements (RWYCCs, contamination type, contamination depth, coverage) are communicated in the GRF format in addition to the METAR elements. The information is communicated for each runway third in the direction of landing/take-off.

Sample ATIS Format:

SINGAPORE CHANGI AIRPORT
ARRIVAL, INFO DELTA, TIME 0630
EXPECT ILS APPROACH RUNWAY TWO ZERO RIGHT
RUNWAY CONDITION REPORT AT ZERO SIX FIVE FOUR
RUNWAY CONDITION TWO TWO TWO
WHOLE RUNWAY [100] PERCENT
FIVE MILLIMETERS STANDING WATER
WIND [360] DEGREES [03] KNOTS
VISIBILITY [3500] METERS
HEAVY SHOWERS OF RAIN
CLOUD: FEW [700] FEET SCATTERED TOWERING CUMULUS [1300] FEET
TEMPERATURE [28]
DEWPOINT [26]
QNH [1008] HECTOPASCALS TREND NOSIG
ACKNOWLEDGE INFORMATION DELTA ON FIRST CONTACT WITH ATC

4.6 SNOWTAM Report

The SNOWTAM will be promulgated whenever a RWYCC 2 is reported. The RCR elements (RWYCCs, contamination type, contamination depth, coverage) are communicated in the GRF format, whereby the information is communicated for each third of the runway from the lowest runway designation number.

Sample SNOWTAM Format:

SNOWTAM 0038
WSSS 02170055 02L 5/5/5 100/100/100 NR/NR/NR WET/WET/WET
WSSS 02170135 02C 5/5/2 75/75/50 NR/NR/4 WET/WET/STANDING
WATER
WSSS 02170225 02R 3/3/5 75/100/100 06/12/12 WET/WET /WET
RWY 02L RET W1 CLOSED. RWY 02C LDA REDUCED TO 3800.
RWY 02R LOOSE SAND. RWY 02R SLIPPERY WET.

4.7 Ground – Air Voice Communications (RT)

Only the Runway Condition Code (RWYCC) for each third of the runway will be communicated through the frequency. The contamination type, contamination depth and coverage will be provided upon request by the pilot. The information is communicated for each runway third in the direction of landing/take-off.

Sample Air-Ground Voice Communication:

SINGAPORE 638, SINGAPORE TOWER, RUNWAY 02L, SURFACE CONDITION
TWO FIVE FIVE, CLEARED TO LAND.
SINGAPORE 2, RUNWAY 20C, SURFACE CONDITION FIVE FIVE TWO. ISSUED
AT 1615 UTC
WET, WET, STANDING WATER
THIRD PART 4 MILLIMETERS
100 PERCENT COVERAGE ALL PARTS.
ESTIMATED SURFACE FRICTION MEDIUM.

5 USING THE INFORMATION

- 5.1 The flight crew must ensure that they have the means to obtain the RCR, the knowledge to interpret the information and capability to calculate consequent aircraft performance (in conjunction with performance data provided by the aircraft manufacturer) to determine if take-off and landing operations can be conducted safely.
- 5.2 All flight crew¹ must not continue an approach to landing unless the pilot-in-command is satisfied that the aircraft can make a safe landing, taking into account the performance of the aircraft; and the information available to the pilot-in-command regarding the runway surface conditions at the aerodrome of intended landing as per Regulation 61 of ANR-91.
- 5.3 It is therefore recommended that the aircraft performance is calculated at an appropriate time prior to the commencement of the approach, to determine the minimum acceptable runway surface conditions.
- 5.4 Regulation 48A(1) of ANR-91 requires the pilot-in-command of an aeroplane operated by an AOC holder to, as soon as possible, provide a runway braking action special air-report (AIREP) to ATC, in the event of experiencing unsatisfactory braking action. Unsatisfactory runway braking action means a braking action that is worse than anticipated by the pilot-in-command, based on the information available to the pilot-in-command regarding the runway surface conditions at the aerodrome of intended landing.

The pilot-in-command should use the terms “GOOD”, “GOOD TO MEDIUM”, “MEDIUM”, “MEDIUM TO POOR”, “POOR” and “LESS THAN POOR” to characterize perceived braking action and lateral control of the aeroplane during landing roll.

RWYCC 0 through 5 are mapped to this terminology in the RCAM and describe a consistent runway surface condition in relation to its effect on aircraft braking performance and lateral control.

- 5.5 The AOC holder should ensure that all flight crew, dispatch and operational control staff are appropriately trained, and operations manuals are appropriately updated to include GRF operational procedures as described in this circular, prior to the implementation date.

¹ Of an aeroplane operated by a holder of a Singapore AOC or a Singapore registered aircraft that has a MCTOM exceeding 5,700kg or is equipped with at least one turbine engine