

NEW ICAO METHODOLOGY FOR ASSESSING AND REPORTING RUNWAY SURFACE CONDITIONS - GLOBAL REPORTING FORMAT

Overview

Global Reporting Format (GRF) is a new ICAO methodology and terminology for assessing and reporting the runway surface conditions.

The ICAO GRF comes into effect on 4 November 2021. Individual States need to implement this in their national laws and procedures. The Isle of Man will be implementing the GRF on 4 November 2021, this will be advised to operators by an update to Registry Publication 4. The Registry understands that EASA member states and Canada are implementing the new provisions from 12 August 2021 in advance of the ICAO implementation date.

Operators need to ensure that their flight crew are prepared to understand and apply the new format runway surface condition reports that they receive and to make reports of runway surface conditions to ATC in the new format. Further detail to the ICAO requirements on operation of aircraft can be found on the last page of the issue of Safety Matters.

Background

Runway excursion is one of aviation's top safety risks. A major contributory factor to runway excursion is poor braking action due to contaminated runways, combined with shortfalls in the accuracy and timeliness of assessment and reporting of the runway surface conditions.

Friction measuring equipment values can be misleading to flight crew. Joint industry and multi-national government tests have not established a reliable correlation between runway friction values and the relationship to airplane braking performance.

GRF aims to improve safety in aircraft landing and take-off. The intent of the new assessment and reporting procedures is to communicate the runway surface conditions impacted by any remaining contamination to the aeroplane operators in a way consistent with the effect on aeroplane performance.

What are the Benefits of GRF?

| | | | | |
|-----------------------------------------------------------------------|------------------------------|-------------------------------------|----------------------------------------|-------------------------------------|
| <ul style="list-style-type: none"> Improved safety | Better understanding of | <input checked="" type="checkbox"/> | Fewer runway excursions | <input checked="" type="checkbox"/> |
| | Better decision making | <input checked="" type="checkbox"/> | Fewer runway closures | <input checked="" type="checkbox"/> |
| <ul style="list-style-type: none"> Improved efficiency | Better traffic management | <input checked="" type="checkbox"/> | Better management of de-icing products | <input checked="" type="checkbox"/> |
| | Reduced Environmental impact | | | |

Runway Condition Report

The GRF relies on the issuance of a **"Runway Condition Report" (RCR)**. This is "a comprehensive standardised report relating to runway surface conditions and its effect on the aeroplane landing and take-off performance".

The philosophy of the RCR is that the aerodrome operator assesses the runway surface conditions whenever water, snow, slush, ice or frost are present on an operational runway. From this assessment, a **"Runway Condition Code" (RWYCC)** and a description of the runway surface are reported which can be used by the flight crew for aeroplane performance calculations. This format, based on the type, depth and coverage of contaminants, is the best assessment of the runway surface condition by the aerodrome operator. All other pertinent information will be taken into consideration and be kept up to date so that changes in conditions can be reported without delay.

The RWYCC reflects the runway braking capability as a function of the surface conditions. With this information, the flight crew can derive, from the performance information provided by the aeroplane manufacturer, the necessary stopping distance of an aircraft on the approach under the prevailing conditions.

When the runway is wholly or partly contaminated by standing water, snow, slush, ice or frost, or is wet associated with the clearing or treatment of snow, slush, ice or frost, the RCR should be disseminated through the AIS and ATS services. When the runway is wet, not associated with the presence of standing water, snow, slush, ice or frost, the assessed information should be disseminated using the runway condition report through the ATS only.

The RCR information shall be included in an information string in the following order using only AIS compatible characters:

| Aeroplane performance calculation section | Situational awareness section |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Aerodrome location indicator; • Date and time of assessment; • Lower runway designation number; • RWYCC for each runway third; • Percent coverage contaminant for each runway third; • Depth of loose contaminant for each runway third; • Condition description for each runway third; and • Width of runway to which the RWYCCs apply if less than published width. | <ul style="list-style-type: none"> • Reduced runway length; • Drifting snow on the runway; • Loose sand on the runway; • Chemical treatment on the runway; • Snowbanks on the runway; • Snowbanks on the taxiway; • Snowbanks adjacent to the runway; • Taxiway conditions; • Apron conditions; • State-approved, and published use of, measured friction coefficient; and • Plain language remarks. |

Assigning a Runway Condition Code

Runway Condition Codes (RWYCC) are assigned in the RCR according to the descriptions as shown in the following table:

| Runway condition description | RWYCC |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| DRY | 6 |
| FROST WET (runway surface is covered by any visible dampness or water up to and including 3 mm deep) SLUSH (up to and including 3 mm depth) DRY SNOW (up to and including 3 mm depth) WET SNOW (up to and including 3 mm depth) | 5 |
| COMPACTED SNOW (Outside air temperature minus 15 degrees Celsius and below) | 4 |
| WET ("Slippery wet" runway) DRY SNOW (more than 3 mm depth) WET SNOW (more than 3 mm depth) DRY SNOW ON TOP OF COMPACTED SNOW (any depth) WET SNOW ON TOP OF COMPACTED SNOW (any depth) COMPACTED SNOW (outside air temperature above minus 15 degrees Celsius) | 3 |
| STANDING WATER (more than 3 mm depth) SLUSH (more than 3 mm depth) | 2 |
| ICE | 1 |
| WET ICE WATER ON TOP OF COMPACTED SNOW DRY SNOW OR WET SNOW ON TOP OF ICE | 0 |

Example of RCR

In the example below, Runway 08 at EGNS (Isle of Man) has been assessed as follows at 0950 on 25 December:

| | 1 third | 2 third | 3 third |
|---------------------------------------------------------------------------|---------|----------|----------|
| Runway condition code RWYCC | 2 | 3 | 3 |
| Percent coverage contaminant | 75 | 100 | 100 |
| Depth of loose contaminant | 6mm | 12mm | 12mm |
| Condition description | Slush | Wet snow | Wet snow |
| Width of runway to which the RWYCC applies (if less than published width) | 30m | 30m | 30m |

AIS - This would be transmitted by the aerodrome operator via AIS as:

(Headers)

GG EGGNYNYX
12250958 EGNSZTZX
(SWEG0100 EGNS 12250950

(Aeroplane performance calculation section)

EGNS 12250950 08 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW 30

(Situational awareness section)

RWY 08 SNOWBANK R30 FM CL. TAXIWAY A POOR.)

ATIS or RTF -reports are given in the direction of take-off/landing, so for the example given:

"Runway 08 surface condition code 2, 3, 3. Slush depth 6 mm, wet snow depth 12 mm, wet snow depth 12 mm. Cleared width 30m. Caution Runway 08 snowbank 30m right of centreline. Taxiway ALPHA poor."



Runway Braking Action Reporting

The role of the flight crew in the runway surface condition reporting process does not end once a safe landing has been achieved. While the aerodrome operator is responsible for generating the RCR, flight crew are responsible for providing accurate braking action reports.

The flight crew braking action reports provide feedback to the aerodrome operator regarding the accuracy of the RCR resulting from the observed runway surface conditions.

ATC passes these braking action reports to the aerodrome operator, which in turn uses them to determine if it is necessary to downgrade or upgrade the RWYCC.

During busy times, runway inspections and maintenance may be less frequent and need to be sequenced with arrivals. Therefore, aerodrome operators may depend on braking action reports to confirm that the runway surface condition is not deteriorating below the assigned RCR.

Since both ATC and the aerodrome operator rely on accurate braking action reports, flight crew should use standardised terminology in accordance with ICAO Doc 4444 'PANS ATM'. The following table shows the correlation between the terminology to be used in the AIREP to report the braking action and the RWYCC.

| Pilot report of runway braking action | Description | Runway condition code (RWYCC) |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| N/A | | 6 |
| GOOD | Braking deceleration is normal for the wheel braking effort applied AND directional control is normal. | 5 |
| GOOD TO MEDIUM | Braking deceleration OR directional control is between good and medium. | 4 |
| MEDIUM | Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced. | 3 |
| MEDIUM TO POOR | Braking deceleration OR directional control is between medium and poor. | 2 |
| POOR | Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced. | 1 |
| LESS THAN POOR | Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain. | 0 |

Aircraft Report (AIREP)

An AIREP should be transmitted to ATC, in accordance with one of the following specifications, as applicable:

- (a) Good braking action is reported as 'BRAKING ACTION GOOD'.
- (b) Good to medium braking action is reported as 'BRAKING ACTION GOOD TO MEDIUM'.
- (c) Medium braking action is reported as 'BRAKING ACTION MEDIUM'.
- (d) Medium to poor braking action is reported as "BRAKING ACTION MEDIUM TO POOR"
- (e) Poor braking action is reported as 'BRAKING ACTION POOR'.
- (f) Less than poor braking action is reported as 'BRAKING ACTION LESS THAN POOR'.

Whenever requested by ATC, or if the braking action encountered during the landing roll is not as previously reported by the aerodrome operator in the RCR, pilots should provide a braking action report. This is especially important and safety relevant where the experienced braking action is worse than the braking action associated with any RWYCC code currently in effect for that portion of the runway concerned.

When the experienced braking action is better than that reported by the aerodrome operator, it is important to report this information, which may trigger further actions for the aerodrome operator in order to upgrade the RCR.

If an aircraft-generated braking action report is available, it should be transmitted, identifying its origin accordingly. If the flight crew have a reason to modify the aircraft-generated braking action report based on their judgement, the commander should be able to amend such report.

A Mandatory Occurrence Report must be submitted whenever low braking action may have represented a significant risk to aviation safety.



New ICAO Requirements on Operation of Aircraft

The following ICAO requirements come into effect on 4 November 2021. The Isle of Man Aircraft Registry will be implementing them on that same day. This will be advised to M-reg operators by an update to Registry Publication 4.

As mentioned in the introduction of this issue of Safety Matters, the Registry understands that EASA member states and Canada are implementing the new provisions from 12 August 2021 in advance of the ICAO implementation date.

ICAO Annex 6 Part 2

2.2.4.2 Meteorological and operational observations by pilots.

2.2.4.2.1 Recommendation — When meteorological conditions likely to affect the safety of other aircraft are encountered, they should be reported as soon as possible.

Note — *The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in Annex 3, the PANS-ATM (Doc 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).*

2.2.4.2.2 Recommendation — The pilot-in-command should report runway braking action when the runway braking action encountered is not as good as reported.

Note — *The procedures for making special air-reports regarding runway braking action are contained in the PANS-ATM (Doc 4444), Chapter 4, and Appendix 1.*

2.2.4.4 Aeroplane operating procedures for landing performance.

Recommendation — An approach to land should not be continued below 300m (1000ft) above aerodrome elevation unless the pilot-in-command is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

Note 1 — *The procedures for using runway surface condition information on board aircraft are contained in the PANS Aerodromes (Doc 9981) and in the performance section of the aeroplane flight manual; and for aeroplanes certificated in accordance with Annex 8, Part III B, in the Aeroplane Performance Manual (Doc 10064).*

Note 2 — *Guidance on development of aeroplane performance information for aeroplanes certificated in accordance with Annex 8, Part III B is contained in the Aeroplane Performance Manual (Doc 10064).*

ICAO PANS ATM (Doc 4444)

4.12.3 Contents of special air-reports.

4.12.3.1 Special air-reports shall be made by all aircraft whenever the following conditions are encountered or observed:

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i) runway braking action encountered is not as good as reported.

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Further Information

[Transport Canada AIC on GRF](#)
[UK CAA GRF Information](#)

[EASA Community Network on GRF](#) [ICAO GRF Information](#)
[ICAO/IATA Online GRF Course for Aircraft Operators and Flight Crew](#)