

Supplementary Instruction CAP 413 Radiotelephony Manual



Safety and Airspace Regulation Group

Airspace, ATM & Aerodromes

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Movement Area Surface Condition Reporting

1 Introduction

- 1.1 The purpose of this Supplementary Instruction (SI) is to detail changes made to the Radiotelephony Manual (CAP 413) relating to the amendment of ICAO Annex 14 'Aerodromes', ICAO Doc 4444 PANS-ATM and ICAO Doc 9981 Procedures for Air Navigation Aerodromes (PANS-ADR) to introduce the Global Reporting Format (GRF).
- 1.2 Version 2 of this supplementary instruction incorporates changes based on industry feedback concerning implementation considerations; no changes have been made to the requirements placed upon ATS providers.

2 Background

- 2.1 Runway safety, particularly runway excursions, remain one of the top aviation safety concerns of the International Civil Aviation Organisation (ICAO). The Flight Safety Foundation echoes these concerns and indicate that the third most common landing excursion risk factor is ineffective braking action, due to runway contamination such as snow, ice, slush or water. This trend is also confirmed by the main aircraft manufactures.
- 2.2 Shortfalls in the accuracy and timeliness of runway assessment and reporting methods by aerodromes have contributed to the problem, despite many decades of research effort to harmonise various friction measurement devices and their linkage to aircraft performance. Whilst friction measurement equipment is useful for runway maintenance purposes, it is misleading to pilots due to the disconnect between the friction measurement and actual aircraft performance. To help mitigate the risk of excursion, ICAO has developed a new harmonized methodology known as the GRF, for assessing and reporting surface conditions on the movement area. This methodology will be globally applicable from 4 November 2021.
- 2.3 It is important to note that GRF is only applicable to paved surfaces and not to grass runways. The CAA has utilised aspects of the GRF methodology (specifically, the surface condition descriptors) to report the surface condition of grass runway.

3 Amendment to CAP 413

- 3.1 With effect from 4 November 2021 CAP 413 is amended as shown at [Appendix A](#). This change will be incorporated into CAP 413 at the next amendment.

4 Queries

4.1 Any queries or further guidance required on the content of this SI should be addressed to:

ATS Enquiries
Airspace, ATM & Aerodromes
Safety and Airspace Regulation Group
Aviation House
Beehive Ringroad
Crawley
West Sussex
RH6 0YR

E-mail: ats.enquiries@caa.co.uk

4.2 Any queries relating to the availability of this SI should be addressed to:

ATS Documents
Safety and Business Delivery
Civil Aviation Authority
Safety and Airspace Regulation Group
Aviation House
Beehive Ringroad
Crawley
West Sussex
RH6 0YR

E-mail: ats.documents@caa.co.uk

5 Cancellation

5.1 This SI shall remain in force until incorporated into CAP 413 or it is cancelled, suspended or amended.

Appendix A

CAP 413 Chapter 4 – Aerodrome Phraseology - Runway Surface Conditions

Editorial Note. *The text below replaces that contained in CAP 413 ED 23 Amendment 1 4.191 through to 4.194.*

Subsequent paragraphs starting from the current 4.193 should be renumbered accordingly beginning with 4.195. In order to permit easy differentiation, only new text has been red-underlined, extant text has not.

Runway surface condition reporting

4.191 When the presence of water or water-based contaminants is brought to the attention of an ATS unit, the information will be passed to aircraft based on the following five elements:

- a) Runway Condition Report (RCR);
- b) Runway Condition Assessment Matrix (RCAM);
- c) Runway Condition Code (RWYCC);
- d) Runway Surface Conditions (Reporting term); and,
- e) Runway Surface Condition Descriptors.

Note: GRF is applicable to paved runways alone. For surface condition reporting of grass runways, see paragraph 4.194 below.

4.192 The presence or otherwise of surface contaminants on each third of a runway surface, together with any other related information, is to be reported on the ATIS. If ATIS is not available or significant changes occur, this information must be reported on the RTF to aircraft concerned in plain language either:

- a) individually; or
- b) via the use of an all-stations broadcast, obtaining acknowledgement from each of the aircraft concerned.

It is important to consider the sequence in which the information should be transmitted, using the following reporting terms (see Table 5), runway surface condition descriptors (see Table 6), other related information (see Table 7) and runway condition codes (see Table 8):

Table 5

Reporting Term	Runway Surface Conditions
DRY	<u>The runway surface is considered dry if it is free of visible moisture and not contaminated within the area intended to be used.</u>
WET	<u>The runway surface is covered by any visible dampness or water up to and including 3 mm depth within the intended area of use.</u> Note: <u>If the surface shows a change of colour due to moisture, the runway will be reported as wet.</u>
<u>SLIPPERY WET</u>	<u>A wet runway where the surface friction characteristics of a significant portion of the runway have been determined to be degraded.</u>
<u>CONTAMINATED</u>	<u>A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.</u> <u>The term 'CONTAMINATED' is not to be used in RTF phraseology, the runway surface condition descriptors in Table 6 are to be used.</u>

Table 6

<u>Runway Surface Condition Descriptor</u>	
<u>COMPACTED SNOW</u>	<u>Snow that has been compacted into a solid mass such that aeroplanes tires, at operation pressure and loadings, will run on the surface without significant further compaction or rutting of the surface.</u>
<u>DRY SNOW</u>	<u>Snow from which a snowball cannot readily be made.</u>
<u>FROST</u>	<u>Frost consists of ice crystals formed from airborne moisture on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture.</u> Note 1: <u>Below freezing refers to air temperature equal to or less than the freezing point of water (0°C).</u> Note 2: <u>Under certain conditions frost can cause the surface to become very slippery and it is then reported appropriately as reduced braking action.</u>

<u>Runway Surface Condition Descriptor</u>	
<u>ICE</u>	<u>Water that has frozen or compacted snow that has transitioned into ice, in cold and dry conditions.</u>
<u>SLUSH</u>	<u>Snow that is so water-saturated that water will drain from it when a handful is picked up or will splatter if stepped on forcefully.</u>
<u>STANDING WATER</u>	<u>Water of depth greater than 3 mm.</u>
<u>WET ICE</u>	<u>Ice with water on top of it or ice that is melting.</u> <u>Note 1: Freezing precipitation can lead to runway conditions associated with wet ice from an aeroplane performance point of view. Wet ice can cause the surface to become very slippery. It is then reported appropriately as reduced braking action in line with procedures in the CAP 168 / PANS-Aerodromes (ICAO Doc 9981).</u>
<u>WET SNOW</u>	<u>Snow that contains enough water content to be able to make a well-compacted, solid snowball, but water will not be squeezed out.</u>

Note 2: In providing information on runway surface conditions, many of the terms described in Table 6 may be used in combination as follows: DRY SNOW ON TOP OF COMPACTED SNOW, DRY SNOW ON TOP OF ICE, WATER ON TOP OF COMPACTED SNOW, WET SNOW ON TOP OF COMPACTED SNOW and WET SNOW ON TOP OF ICE.

Note 3: Descriptions of surface contamination will include, where applicable, the depth of deposit.

Table 7

<u>Other related information</u>
<p><u>For example, provide details of any:</u></p> <ul style="list-style-type: none"> <u>runway de-icing activity that has taken place, such as chemical treatment or sanding;</u> <u>provide details of any snowbanks on the runway giving the distance left/right from the runway centreline;</u> <u>frozen ruts and ridges.</u>

Table 8

Runway Condition Assessment Matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway Condition code	Runway surface description	Aeroplane deceleration or direction control observation	Pilot report of runway braking action
6	<ul style="list-style-type: none"> <u>DRY</u> 	---	---
5	<ul style="list-style-type: none"> <u>FROST</u> <u>WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</u> <p>Up to and including 3 mm depth:</p> <ul style="list-style-type: none"> <u>SLUSH</u> <u>DRY SNOW</u> <u>WET SNOW</u> 	<p><u>Braking deceleration is normal for the wheel braking effort applied and direction control is normal</u></p>	<u>GOOD</u>
4	<p><u>-15°C and colder outside air temperature:</u></p> <ul style="list-style-type: none"> <u>COMPACTED SNOW</u> 	<p><u>Braking deceleration OR</u> <u>directional control is between Good and Medium</u></p>	<u>GOOD to MEDIUM</u>
3	<ul style="list-style-type: none"> <u>WET ("slippery wet" runway)</u> <u>DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</u> <p>More than 3 mm depth:</p> <ul style="list-style-type: none"> <u>DRY SNOW</u> <u>WET SNOW</u> <p>Warmer than -15°C outside air temperature:</p> <ul style="list-style-type: none"> <u>COMPACTED SNOW</u> 	<p><u>Braking deceleration is noticeably reduced for the wheel braking effort applied</u></p> <p><u>OR</u></p> <p><u>directional control is noticeably reduced.</u></p>	<u>MEDIUM</u>
2	<p>More than 3 mm depth of water or slush:</p> <ul style="list-style-type: none"> <u>STANDING WATER</u> <u>SLUSH</u> 	<p><u>Braking deceleration OR</u> <u>Directional control is between Medium and Poor.</u></p>	<u>MEDIUM to POOR</u>
1	<ul style="list-style-type: none"> <u>ICE</u> 	<p><u>Braking deceleration is significantly reduced for the wheel braking effort applied</u></p> <p><u>OR</u></p>	<u>POOR</u>

Runway Condition Assessment Matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway Condition code	Runway surface description	Aeroplane deceleration or direction control observation	Pilot report of runway braking action
		<u>Directional control is significantly reduced.</u>	
0	<ul style="list-style-type: none"> <u>WET ICE</u> <u>WATER ON TOP OF COMPACTED SNOW</u> <u>DRY SNOW or WET SNOW ON TOP OF ICE</u> 	<u>Braking deceleration is minimal to non-existent for the wheel braking effort applied</u> <u>OR</u> <u>directional control is uncertain.</u>	<u>LESS THAN POOR</u>

Note 1: Descriptions of surface contamination will include, where applicable, the depth of deposit.

Note 2: Runway surface temperature should preferably be used where available.

Note 3: The aerodrome operator may assign a higher RWYCC (but not greater than RWYCC 3) for each third of the runway, provided the specific procedure is followed.

4.193 Reports of the runway condition, to be used on ATIS or RTF for each third shall be given in the direction of take-off or landing.

	<u>BIGJET 347, Runway 34 surface condition [CODE] 6, 5, 2. Dry; wet; standing water, depth 6 millimetres.</u>
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A broadcast on change of conditions (ATIS or plain language transmission) would be transmitted as:

	<u>All stations Walden Tower issued at (date and time UTC). Runway 34 surface condition [CODE] 6, 5, 5. Dry; wet; wet.</u>
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A more complex report may include the type of contamination, its depth and/or other essential information such as Work in Progress (WIP)

	<u>BIGJET 347, Runway 34 surface condition [CODE] 6, 5, 2. Dry; wet snow patches, depth 20 millimetres; standing water, depth 5 millimetres. Caution construction work taxiway alpha.</u>
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Grass runways

- 4.194 In reporting the surface condition of a grass runway, the report relates to the whole of the surface, and not to individual thirds. When the grass runway's surface condition is assessed as being WET or CONTAMINATED, then its condition, together with any other related information, is to be reported as detailed in paragraph 4.192, using the descriptions contained in Tables 5, 6 and 7 above. A RWYCC is not to be passed.

	<u>G - CD Runway 34 surface is covered with wet snow on top of compacted snow.</u>
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