

Assessment, Measurement and Reporting of Runway Surface Conditions for Licensed Aerodromes (Applicable 4 November 2021)

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Runway Surface Condition Assessment and Reporting (Applicable 4 November 2021)

Introduction

- 1.1 The global reporting system for assessing and reporting runway surface conditions (commonly known as the Global Reporting Format (GRF)) involves all stakeholders involved in collecting data, converting the data into structured operational information and bringing the structured information to the end users, and the end users using the structured information.
- 1.2 A fundamental change in the new reporting system is the introduction of a runway condition code (RWYCC).
- 1.3 The assessment process of assigning a RWYCC is a deterministic, 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 be downgraded or upgraded using procedures detailed in Paragraph 41.
- 1.4 The revised scale GOOD, GOOD TO MEDIUM, MEDIUM, MEDIUM TO POOR, POOR and LESS THAN POOR is used by the flight crew to characterize perceived braking action and lateral control of the aeroplane during landing roll. RWYCCs 0 through 5 are mapped to this terminology in the runway condition assessment matrix (RCAM) and describe a consistent runway surface condition in relation to its effect on aircraft braking performance and lateral control.
- 1.5 Another fundamental change is that WET runway conditions are included in the runway condition report (RCR) on a regular basis.
- 1.6 The concept of the RCR is premised on:
 - a) an agreed set of criteria used in a consistent manner for runway surface condition assessment, aeroplane (performance) certification and operational performance calculation;
 - b) a unique runway condition code (RWYCC) linking the agreed set of criteria with the aircraft landing and takeoff performance table, and related to the braking action experienced and eventually reported by flight crews;
 - c) reporting of contaminant type and depth that is relevant to take-off performance;

- d) a standardized common terminology and phraseology for the description of runway surface conditions that can be used by aerodrome operator inspection personnel, air traffic controllers, aircraft operators and flight crew; and
 - e) globally harmonized procedures for the establishment of the RWYCC with a built-in flexibility to allow for local variations to match the specific weather, infrastructure and other particular conditions.
- 1.7 These harmonized procedures are reflected in a runway condition assessment matrix (RCAM) which correlates the RWYCC, the agreed set of criteria and the aircraft braking action which the flight crew should expect for each value of the RWYCC.
- 1.8 It is recognized that information provided by the aerodrome's personnel assessing and reporting runway surface condition is crucial to the effectiveness of the runway condition report. However, a misreported runway condition alone should not lead to an accident or incident. Operational margins should cover for a reasonable error in the assessment, including unreported changes in the runway condition. But a misreported runway condition can mean that the margins are no longer available to cover for other operational variance (such as unexpected tailwind, high and fast approach above a threshold or long flare).
- 1.9 This is further amplified by the need for providing the assessed information in the proper format for dissemination, which requires insight into the limitations set by the syntax for dissemination. This in turn restricts the wording of plain text remarks that can be provided.
- 1.10 It is important to follow standard procedures when providing assessed information on the runway surface conditions to ensure that safety is not compromised when aeroplanes use wet or contaminated runways. Personnel should be trained in the relevant fields of competence and their competence verified to ensure confidence in their assessments.

Reporting of Surface Contaminants

- 1.11 The aerodrome operator shall report to the aeronautical information services and air traffic services units on matters of operational significance affecting aircraft and aerodrome operations on the movement area, particularly in respect of the presence of the following:
- a) water;
 - b) snow;
 - c) slush;
 - d) ice;

- e) frost;
- f) anti-icing or de-icing liquid chemicals or other contaminants; and
- g) snowbanks or drifts.

1.12 The aerodrome operator shall report the runway surface condition over each third of the runway using a runway condition report (RCR). The report shall include a runway condition code (RWYCC) using numbers 0 to 6, the contaminant coverage and depth, and a description to be reported in capital letters using the following terms:

- a) COMPACTED SNOW; (snow that has been compacted into a solid mass such that aeroplane tyres, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface)
- b) DRY;
- c) DRY SNOW; (snow from which a snowball cannot readily be made)
- d) DRY SNOW ON TOP OF COMPACTED SNOW;
- e) DRY SNOW ON TOP OF ICE;
- f) FROST; (ice crystals formed from airborne moisture on a surface whose temperature is at or below freezing; frost differs from ice in that frost crystals grow independently and therefore, have a more granular texture)
- g) ICE; (water that has frozen or compacted snow that has transitioned into ice in cold and dry conditions)
- h) SLIPPERY WET;
- i) SLUSH; (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)
- j) SPECIALLY PREPARED WINTER RUNWAY;
- k) STANDING WATER; (water of depth greater than 3 mm)
- l) WATER ON TOP OF COMPACTED SNOW;
- m) WET;
- n) WET ICE; (ice with water on top of it or ice that is melting)
- o) WET SNOW; (snow that contains enough water to be able to make a well-compacted, solid snowball, but water will not squeeze out)
- p) WET SNOW ON TOP OF COMPACTED SNOW;
- q) WET SNOW ON TOP OF ICE;

r) CHEMICALLY TREATED;

s) LOOSE SAND;

- 1.13 Reporting shall commence when a significant change in runway surface condition occurs due to water, snow, slush, ice or frost.
- 1.14 Reporting of the runway surface condition shall continue to reflect significant changes until the runway is no longer contaminated. When this situation occurs, the aerodrome operator shall issue an RCR that states that the runway is wet or dry as appropriate.
- 1.15 Significant changes in the runway surface condition used in the runway condition report are described in Paragraph 28.
- 1.16 Friction measurements shall not be reported (see Para. 29).
- 1.17 When a paved runway or portion thereof is slippery wet, the aerodrome operator shall make such information available to the relevant aerodrome users. This shall be done by issuing a NOTAM and shall describe the location of the affected portion.

Runway Condition Report

- 1.18 Assessing and reporting the condition of the movement area and related facilities is necessary in order to provide the flight crew with the information needed for safe operation of the aeroplane. The RCR is used for reporting assessed conditions through the issuance of SNOWTAM, when necessary.
- 1.19 Generally, movement areas are exposed to a multitude of climatic conditions and consequently there is a significant difference in the conditions to be reported. The RCR describes a basic structure applicable for all these climatic variations. Assessing the runway surface condition relies on a great variety of techniques and no single solution can apply to every situation.
- 1.20 The RCR should consist of the:
- a) aeroplane performance calculation section; and
 - b) situational awareness section.
- 1.21 The information should be included in an information string in the following order:
- a) **aeroplane performance calculation section:**
 - (i) aerodrome location indicator;
 - (ii) date and time of assessment;
 - (iii) lower runway designation number;
 - (iv) RWYCC for each runway third;
 - (v) per cent coverage contaminant for each runway third;
 - (vi) depth of loose contaminant for each runway third;

- (vii) condition description for each runway third; and
- (viii) width of runway to which the RWYCCs apply if less than the published width.

b) **Situational awareness section:**

- (i) reduced runway length;
- (ii) drifting snow on the runway;
- (iii) loose sand on the runway;
- (iv) chemical treatment on the runway;
- (v) snowbanks on the runway;
- (vi) snowbanks on the taxiway;
- (vii) snowbanks adjacent to the runway;
- (viii) taxiway conditions;
- (ix) apron conditions; and
- (x) plain-language remarks.

- 1.22 The philosophy of the RCR is that the aerodrome operator assesses the runway surface condition whenever water, snow, slush, ice or frost are present on an operational runway. From this assessment, a 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; however, all other pertinent information is taken into consideration and kept up to date, and changes in conditions are reported without delay.
- 1.23 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.

AEROPLANE PERFORMANCE CALCULATION SECTION

- 1.24 The aeroplane performance calculation section is a string of grouped information, separated by a space ' ' ending with a return and a two-line feed '<<≡', in order to distinguish the aeroplane performance calculation section from the following situational awareness section or the following aeroplane performance calculation section of another runway.
- 1.25 The information to be included in this section consists of the following:
- a) **Aerodrome location indicator:** a four-letter ICAO location indicator in accordance with ICAO Doc 7910, *Location Indicators*.
This information is mandatory.
Format: nnnn
 - b) **Date and time of the assessment:** date and time (UTC) when the assessment was performed.
This information is mandatory.