



ICAO

*International Civil Aviation Organization*The Seventh Meeting of the Asia/Pacific
Aerodrome Assistance Working Group (AP-AA/WG/7)*Bangkok, Thailand, 27 to 30 May 2025***Agenda Item 4: Runway Safety and GRF Implementation****RUNWAY SURFACE CONDITION ASSESSMENT – ADOPTION OF TECHNOLOGY**

(Presented by New Zealand)

SUMMARY

This paper presents the regulatory challenges facing the introduction of automation to assist in the assessment of runway surface conditions.

1. INTRODUCTION

1.1 Wellington International Airport Limited in June 2019 presented to the APAC Regional Seminar on the Implementation of the New Global Reporting Format for Runway Surface Conditions, its progress with the implementation of an automated in-runway sensor system for the measurement of moisture on the runway surface.

1.2 The decision to implement a level of automation to assist with the assessment process was largely based upon the inability to freely access the runway at critical times due to a number of factors including traffic density and the localizer sensitive area covering at least a third of the available runway length, being protected during instrument approach conditions.

1.3 The solution adopted for assessing runway surface conditions incorporated a number of strategically placed sensors in each runway third which measured during each minute, the average level of moisture on the runway surface, and displayed this as a runway condition code for each runway third, acknowledging the most conservative measurement from each of the sensors in that particular third of the runway.

1.4 The general temperate weather conditions in New Zealand results in the majority of runway surface conditions assessments at most airports being either DRY or WET. This is the case at Wellington International Airport.

2. DISCUSSION

2.1 The automated system adopted by Wellington International Airport Limited has been in operation since 2019. The accuracy of measurement of the sensors utilised is to 0.01mm.

2.2 Annex 14 Volume 1 notes within the definition for “Runway Surface Conditions” that “WET runway. A runway surface is covered by any visible dampness or water up to and including 3mm deep within the intended area of use.” The definition has subsequently been adopted in a variety of stakeholder documents including acknowledgement within airline operating manuals.

2.3 The inclusion of the word “visible” while simplifying the process still leads to a level of subjectivity when ambient lighting conditions at the time of assessment and even eye health is considered. By comparison the inset runway sensors can accurately measure whether moisture is present and its depth to a defined upper limit.

2.4 In programming the algorithms for the runway sensors to display the applicable runway condition code, Wellington Airport staff through visual monitoring and incremental changes over the course of one year, arrived at a comparative sensor measurement of 0.04mm of moisture present as being representative of visible dampness on our grooved asphalt runway surface. This is however extremely difficult to scientifically prove. Although stakeholders are very supportive of the use of technology, they are unable to offer their written acceptance of the system as no “visual” assessment has been undertaken given the interpretation of the ICAO definition.

2.5 Similarly to the introduction of text into ICAO documentation concerning arresting systems being able to be considered acceptable by the State to meet the requirements of a Runway End Safety Area, allowing States to consider automation methods as an acceptable means of compliance to assist with the assessment of runway surface conditions would better facilitate the introduction of automation and technology to achieve the required performance and safety outcomes.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss the draft conclusion appended below, and
- c) discuss any relevant matters as appropriate.

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Draft Conclusion/Decision AP-AA/WG/7 – WP09- : RUNWAY SURFACE CONDITION ASSESSMENT – ADOPTION OF TECHNOLOGY	
What: Restricting assessment of runway surface conditions to visual means only, especially for DRY or WET conditions restricts the introduction of technology and automation to assist airport operators to meet the performance and safety outcomes desired. ICAO is requested to permit States to consider the use of technology and automation methods as an acceptable means of compliance, to assist aerodrome operators in the assessment of runway surface conditions.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Technology and automation can equally meet the performance and safety outcomes desired in assessing runway surface conditions for reporting in global reporting format	Follow-up: ☐ Required from States
When: 30-May-25	Status: Draft to be adopted by Subgroup
Who: ☐ Sub groups ☐ APAC States ☐ ICAO APAC RO ☐ ICAO HQ ☐ Other: XXXX	

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