



WORKING PAPER

FOURTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 26 August to 6 September 2024

- Agenda Item 2: Timely and safe use of new technologies**
2.1: Evolving aircraft technologies contributing to LTAG

CONSIDERATION OF CLIMATE CHANGE IN AERODROME STANDARD-SETTING

(Presented by Airports Council International and co-sponsored by Japan)

EXECUTIVE SUMMARY

As the impacts of climate change on aerodrome operations and infrastructure become more evident it is essential to consider these in the development of future aerodrome standard-setting. This paper seeks recognition of the importance of considering the challenges related to the evolving climate, as well as its impacts on aerodrome operations and infrastructure, in the standard-setting process for aerodromes.

Action: The Conference is invited to:

- a) consider the impacts that climate change can have on aerodrome operations and infrastructure, as presented in this paper;
- b) request that the Standard-setting process within ICAO considers potential climate change impacts when developing future aerodrome provisions; and
- c) consider the need for a broader discussion, outside of the aerodrome domain, on considering possible climate impacts when developing technical and operational provisions.

1. INTRODUCTION

1.1 Climate change is a global challenge requiring further and urgent global response. The impacts of major climate events, such as storms, strong winds or significant temperature variations, on aerodrome operations and infrastructure are becoming more frequent and disruptive.

1.2 In Resolution A41-21, “Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change”, paragraph 29, the ICAO Assembly requested the Council to “identify the potential impacts of climate change on international aviation operations and related infrastructure, identify adaptation measures to address the potential climate change impacts, and maintain and enhance guidance on climate change risk assessment and adaptation measures for international aviation, in cooperation with other relevant international organizations and the industry”.

¹ Arabic, Chinese, English, French, Spanish and Russian versions provided by ACI.

1.3 At the same time, ICAO continues to adopt new aerodrome-related material, Standards and Recommended Practices (SARPs) and guidance. Some of these provisions may be impacted by climate change and its longer-term effects.

2. DISCUSSION

2.1 Major climatic events, such as floods, rising sea-levels, violent storms, higher average and extreme temperatures, and changing wind patterns, seem to continue to be stronger and more frequent with significant impacts on aerodrome operations and infrastructure. These events have created major disruptions to aeronautical operations, both in the air and on the ground as experienced through the floods in Dubai or Paris airports during the month of May 2024.

2.2 While the SARPs contained in Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*, and associated aerodrome related Procedures for Air Navigation Services (PANS) or guidance material provide clear provisions for the development of aerodrome infrastructure and management of operations, these do not specifically address climate related aspects. These provisions do however address elements of infrastructure or operations that are affected by climate change.

2.3 For example, Chapter 2 of Annex 14, Volume I addresses strength of pavements and Chapter 10 addresses pavement maintenance. In principle, pavements used on aerodromes are developed to support typical peak temperatures based on a methodology for averaging historic peak temperatures. However, there are no provisions for consideration of future temperature volatility risk due to climate change. Depending on the type of pavements used, the temperature anomalies can deteriorate the surface of the pavement, particularly in temperature extremes, potentially creating ruts or loose material that can in turn become foreign object debris and a risk for aircraft.

2.4 In addition, Chapter 4 of Annex 14, Volume I addresses obstacle limitation surfaces, including the take-off and climb surfaces. This surface is developed to safeguard the aircraft from obstacles during its take-off from an aerodrome. Rising temperature or stronger winds can have an impact on the performance of aircraft as per Annex 6 — *Operation of Aircraft*, also impacting their distance requirements on runways.

2.5 These examples of elements that have recently been reviewed or are currently being considered by the Aerodrome Design and Operations Panel would benefit from an analysis considering possible evolutions of normal operating temperatures on aerodromes. This analysis may conclude that the provisions, SARPs or guidance, may need to be adjusted to include climate adaptation.

2.6 The regulatory development process within ICAO takes a certain amount of time, from inception of the provision until it is effective and applicable. It then also takes time to update and review provisions that have been adopted. Given this slow rate of change, it may be necessary to consider the possible impacts of climate change on the aerodrome operations and infrastructure when developing new provisions, so as to ensure these are adapted to the rapidly evolving reality.

2.7 While this paper focuses on aerodrome related provisions, climatic events equally impact flight operations. It may be necessary to consider the impacts of climate change and the relevance of adaptation in the development of provisions across other domains, such as air traffic management or flight operations.

3. **CONCLUSION**

3.1 The Conference is invited to:

- a) consider the impacts that climate change can have on aerodrome operations and infrastructure, as presented in this paper;
- b) request that the standard setting process within ICAO considers potential climate change impacts when developing future aerodrome provisions; and
- c) consider the need for a broader discussion, outside of the aerodrome domain, on considering possible climate impacts when developing technical and operational provisions.

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