



ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other issues to be considered by the Technical Commission

UPDATES ON THE OPERATION AT HIGH ELEVATION AERODROMES

(Presented by China)

EXECUTIVE SUMMARY

Recent years have seen accelerated growth in the number of passenger traffic at high elevation aerodromes around the globe. Many States and organizations have recognized this momentum, and also came to realize the unique characteristics and potential risks related to aircraft operation at high elevation aerodromes. China presented A39-WP/336 Revision No. 1 to the 39th Session of the ICAO Assembly held in September 2016. The working paper described the unique characteristics of and difficulties in the operation at high elevation aerodromes, and supported ICAO in developing standards and guidance materials on the basis of harmonizing regulatory requirements and procedures for such operation.

This working paper invites the Assembly to consider the information and background provided and to further support relevant work of ICAO in this field, so as to promote the development and safe operation at high elevation aerodromes around the world.

Action: The Assembly is invited to:

- a) consider the information and background provided in this working paper;
- b) support ICAO in developing or upgrading relevant standards and guidance materials on the basis of harmonizing regulatory requirements and procedures for such operations for States; and
- c) support ICAO in working with Member States, the industry and other stakeholders for the standardization of best practices and globally harmonized Standards and Recommended Practices (SARPs).

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objectives of Safety and Air Navigation Capacity and Efficiency.
<i>Financial implications</i>	The activities referred to in this paper will be subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions. The financial implications of the activities will be limited.
<i>References:</i>	Annex 6 — <i>Operation of Aircraft</i> Doc 8168, <i>Procedures for Air Navigation Services — Aircraft Operations</i> (PANS-OPS) A39-WP/336 Revision No. 1 A39-WP/476

¹ English and Chinese versions provided by China.

1. INTRODUCTION

1.1 On the 39th Session of the Assembly held at the ICAO Headquarters from 27 September to 7 October 2016, the Technical Committee deliberated the amended draft No. 1 of A39-WP/336 presented by China. The paper introduced the great difficulties for flight operations at high elevation aerodromes (usually in mountainous areas), and suggested full consideration be given to the challenges for airport operation due to the environmental characteristics of high-altitude areas. The Technical Committee agreed to submit the proposal included in the paper to the Council for further deliberation (in A39-WP/476).

1.2 China present these issues and challenges to the 56th conference of Directors General of Civil Aviation Asia and Pacific Regions, further introduced the similarities of difficulties that may be faced by Member States related to the operation at high elevation aerodromes, and the challenges and potential risks regarding regulation and operation management for civil aviation authorities and aviation carriers due to absence of harmonized international standards and guiding materials. It was mentioned that a special approval should be achieved for the operations at high elevation aerodromes.

2. DISCUSSION

2.1 In recent years, due to the efforts to accommodate the rapid development of connectivity with plateau areas and to stimulate local economy, the industry has witnessed an increasing number of high elevation aerodromes being built and put into operation. Up to now, there are 63 civil airports around the world located higher than 8 000 feet above sea level, mainly near the Himalayas of Asia and the Andes of South America. Taking the Colombia's Bogota Eldorado International Airport for example, annual growth of passenger traffic there registered as high as 8% on average from 2010 to 2018. China, as one of the countries housing most of the high elevation aerodromes, is facing the same situation in terms of the increased number of new airports and passenger traffic growth in high-altitude areas. For instance, Lhasa Airport has seen a 20 per cent annual increase in passenger throughput on average from 2010 to 2018.

2.2 It has been agreed that the industry has noticed the rapid development of high elevation aerodromes worldwide, which has brought greater challenges and potential risks for the regulation and operation management of civil aviation authorities and air operators. The Civil Aviation Administration of China (CAAC) has for a long time worked together with Airbus, Boeing, GE, among other enterprises, as well as foreign civil aviation authorities and industry associations in jointly conducted researches.

2.3 Since the first high elevation aerodrome in China, Lhasa Airport, was put into operation in 1965, CAAC and Chinese air operators have accumulated rich management and operation experience in terms of high elevation aerodrome operation management, classification standards and operation requirements for special airports, construction of oxygen supply system at high elevation aerodromes and use of medical standards, and have jointly maintained a satisfactory operation safety record for as long as half a century at high elevation aerodromes.

2.4 Through joint research by CAAC and other stakeholders, it has been found that the operation at high elevation aerodrome can be distinguished from that at the airports at common altitude by the following characteristics and difficulties:

- a) decrease of aircraft performance and low density of air;
- b) complex flight procedures designed leading to complex flight operation due to poor clearance conditions at the mountainous areas where the airports are located;

- c) increased flight operation difficulty caused by unfavourable and changeable weather and complex geographical conditions including turbulence, wind shear, dust, low clouds, low visibility, among others;
- d) limited navigation capabilities due to difficulty in setting up navigation device and caused by the communication and navigation signals being blocked and reflected by terrain; and
- e) human hypoxia caused by oxygen scarcity, which results in poorer performance in thinking and reaction speed of operators, causing higher possibility of human errors.

2.5 Because of the above characteristics, flight operations are more difficult at high elevation aerodromes with more risks and less accessibility. In order to deal with potential safety risks, it is often inadequate to simply copy the operation management mechanisms applicable to ordinary airports for high elevation aerodromes, which may cause higher possibility of accidents or incidents at high elevation aerodromes.

2.6 Compared with the relatively small traffic during the early-stage construction of high elevation aerodromes, passenger volume in recent years at many high elevation aerodromes worldwide has been rocketing. However, ICAO's specifications related to flight operations were formulated earlier, therefore no specific guidance for the operation and management of high elevation aerodromes was mentioned when drafting Annex 6 and its guiding documents. As a result, the absence of coordinated and harmonized practices and guiding documents under the framework of ICAO has led to the formation of various regulation requirements by civil aviation authorities on the basis of their own actual operation situations of high elevation aerodromes, which caused the co-existence of different certification and supervision procedures in multi-national environments, and also hindered the sharing and learning of best practices at national level.

2.7 Therefore, we call on ICAO, individual Member States and other stakeholders to pay more attention to the operations at high elevation aerodromes, and suggest that, within the framework of ICAO to enhance capacity and efficiency of global civil aviation system, and in the light of the existing best practices and possible mitigation strategies in the operation at high elevation aerodromes, ICAO develop harmonized standards and guiding documents on the basis of coordinating regulation requirements and procedures for activities of this kind among States, so as to promote the development of high elevation aerodrome operation worldwide and ensure operation safety. It should be pointed out that the coordinated and harmonized approach should not cause potential infringement on the rights and regulatory responsibilities of the State of the Operator, but aim to help States to optimize regulatory resources, enhance operational efficiency and safety, and provide support for more States to build operational capacity at high elevation aerodromes.

3. CONCLUSION

3.1 With the continuous development of global civil aviation transport industry, the number of high elevation aerodromes and their passenger traffic is growing rapidly. This promising prospect of business growth has been noticed by more and more States and industry organizations, who in the meantime have also become aware of the distinctiveness and potential safety risks of the operation at high elevation aerodromes.

3.2 High elevation aerodromes bring new challenges not only to flight operation, but also to the regulation by the authorities. In order to deal with these challenges, we call on ICAO, Member States and the industry to cooperate closely to ensure that regulatory measures keep pace with the times so as to ensure that the aviation industry continues to maintain a good safety record. We invite ICAO to prioritize

the operational standards at high elevation aerodromes, to promote continuous input and work on the operation at high elevation aerodromes, and cooperate with States and the industry on the study of how to better operate at airports at high altitude while fulfilling national oversight duties. The ultimate goal is to achieve standardization of best practices and harmonization of standards and recommended practices through international cooperation, and update or amend relevant annexes or guidance material.

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