



## **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**

### **APPLICATION OF UNMANNED PASSENGER BOARDING BRIDGE**

(Presented by China)

#### **EXECUTIVE SUMMARY**

With the continuous growth of the traffic volume of global air transportation, traditional manually operated boarding bridge faces increasing challenges of safety and efficiency when dealing with high-density flight operations. In order to further improve airport operation efficiency and flight regularity, and make full use of intelligent technologies to support safe and efficient airport operation, this paper outlines the development by China's civil aviation industry of unmanned passenger boarding bridges and their application in domestic and foreign airports. Meanwhile, the Civil Aviation Administration of China (CAAC) has developed and issued technical requirements and testing specifications for unmanned passenger boarding bridges, in order to promote the application of this unmanned technology globally, improve the operational safety of large airport equipment worldwide, and guarantee flight regularity rate and apron turnover efficiency.

## **1. INTRODUCTION**

### **1.1 Operation of unmanned passenger boarding bridge has several advantages:**

- a) the bridge can be docked with and removed from an aircraft in a relatively short period of time, thus reducing the hold time of flights on the ground and improving flight regularity rate and apron turnover efficiency;
- b) it is possible to dock the bridge more accurately with an aircraft via the use of high-precision sensors and advanced collision avoidance systems, thus reducing the risk of human error and collision with the aircraft;
- c) the use of automatic technologies reduces the need for operators and lowers labour costs at airports; and

<sup>1</sup> Chinese and English versions provided by China.

- d) the unmanned boarding bridge can operate stably under various weather conditions and is not affected by weather, thus ensuring regular flight operation.

## 2. DISCUSSION

### *Application of unmanned passenger boarding bridge at China's civil airports*

2.1 With the rapid development of unmanned technology, unmanned passenger boarding bridges have been widely used since 2022, including at Chengdu Tianfu Airport and Hulanbuir Hailar Airport.

2.2 Through the use of automatic artificial intelligence technology, unmanned passenger boarding bridge can automatically identify and locate aircraft doors, and automatically control the docking of the bridge with aircraft doors, so as to achieve a fast, stable and accurate docking.

2.3 As the unmanned passenger boarding bridge is based on artificial intelligence algorithms and high-precision sensors, the boarding bridge in the automatic operation mode can be docked within 50 seconds.

2.4 Unmanned passenger boarding bridge applies ultrasonic, millimeter wave and other technologies to ensure that the bridge will not collide with apron equipment and aircraft.

2.5 Due to the higher efficiency, the application of unmanned passenger boarding bridge reduces the waiting time of passengers on board, improves the turnover efficiency of aircraft and passengers, and improves the operation efficiency of airports and airlines.

2.6 The application of unmanned passenger boarding bridge reduces aircraft's apron occupation time and use of auxiliary power-unit (APU), thus reducing aircraft carbon emission and contributing to green development.

2.7 Earlier on, the unmanned boarding bridge originated by China's civil aviation industry was officially put into operation at Amsterdam Airport Schiphol in the Netherlands, which attracted attention from the industry. To this end, China's civil aviation industry has developed and issued relevant standards for unmanned passenger boarding bridges, which can be used as reference by countries around the world to jointly improve the quality of airport operation.

## 3. CONCLUSION

3.1 Unmanned passenger boarding bridge contributes significantly to the improvement of airport operation safety and efficiency as it can enhance the operation safety of large airport equipment around the world, and guarantee, to a great extent, flight regularity rate and apron turnover efficiency.

3.2 States are encouraged to share their experience in the application of unmanned equipment at airports in an effort to jointly enhance worldwide airport operation safety and efficiency.