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## **THIRTEENTH AIR NAVIGATION CONFERENCE**

**Montréal, Canada, 9 to 19 October 2018**

### **COMMITTEE A**

**Agenda Item 2: Enabling the global air navigation system**

**2.1: Aerodrome operations and capacity**

### **RUNWAY INCURSION AVOIDANCE RESEARCH OF CAAC, CHINA**

(Presented by China)

#### **EXECUTIVE SUMMARY**

Runway incursion remains one of the biggest risks and needs to be highly concerned by all stakeholders. This paper briefly introduces the research of CAAC in preventing runway incursions. The combination of new technologies or new technologies provides new technical conditions to prevent runway incursions.

#### **1. INTRODUCTION**

1.1 In recent years, as the throughput of civil aviation transportation in China continuously increases, scale of airports keeps expanding, and the layouts of runways and taxiways get more and more complicated, which brings about serious challenge to airport operation and management, and the risk of runway incursions has a tendency of rising. According to analysis, there have been 9 domestic runway incursion incidents related to air traffic control in the last 5 years, and one of which is the level A runway incursion incident.

#### **2. DISCUSSION**

2.1 CAAC attaches great importance to runway safety, in order to reduce the occurrence of runway incursion incidents, actively organized cooperation of research institutes, air traffic control (ATC) facilities, airports, airlines and other related stakeholders, and did large amount of work on the research of runway incursions, aiming at providing effective and feasible solutions to prospective runway incursion problems and enhancing runway safety.

2.2 CAAC has made the following progress and achievement with respect to runway incursion avoidance.

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

2.2.1 By analyzing current situation and future trending of runway incursion avoidance technology development, CAAC proposed an innovative technical solution to prevent runway incursions. Right now, CAAC is carrying out demonstration and validation of this technical solution at Shanghai Hongqiao Airport, and all the demonstration and validation work is expected to be finished by end of this year.

- 1) This technical solution first applies MLAT, or Surface Movement Radar (SMR) or Automatic Dependent Surveillance- Broadcast (ADS-B) to provide surface situation awareness.
- 2) Through application of Advanced Surface Movement Guidance and Control System (A-SMGCS), when the system detects any predictable runway incursions or conflicts between aircraft surveillance data and ATC commands on the electronic flight strips, the system will give the controller timely alert to mitigate the risk induced by mistaken ATC commands.
- 3) At the same time the surveillance and alert information can be transmitted to vehicle and airborne devices through AeroMACS to improve pilots' and vehicle drivers' situation awareness.
- 4) Runway Status Light System receives surveillance information output from A-SMGCS, decides whether the runway is safe or not based on the situation, and illuminates the runway status lights to alert the pilots and vehicle drivers if it's not safe to get into the runway.

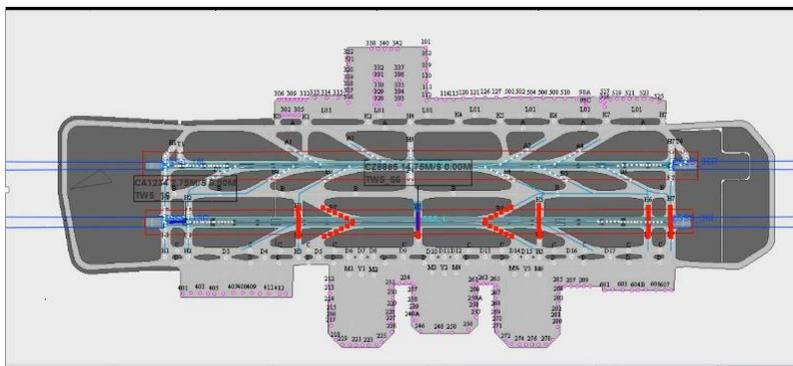


Figure 1 Hongqiao Airport Runway Intrusion Warning Lighting System

2.2.2 On the basis of proposed general technical solution, considering various airport types, CAAC made short-term, mid-term and long-term plan for implementation of runway incursion avoidance technology, and gave suggestions on standardization of system functions, technical configurations, system maintenance and other aspects, to provide the airports with guidance on customized configuration of runway incursion avoidance equipment in accordance with specific airport layout and main triggers of runway incursions.

2.2.3 CAAC also launched research on optimization of air traffic control operation, put forward suggestions on air traffic control procedure optimization with respect to coordination in air traffic control optimization, enhancement of situation awareness, standards of issuing air traffic control commands, standards of voice communication, methods to handle various issues after implementation of new technologies and so on.

### 3. CONCLUSION

3.1 Runway incursion remains one of the largest risk for civil aviation operations which must be continued to be highly concerned by all stakeholders.

3.2 With the development of technology, new technologies Or a combination of multiple technologies have created more technical conditions to prevent runway incursions. Along with technological advancement, we can also continuously improving the rules and procedures for operation regulations and procedures to reduce runway incursions effectively.

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