MET SG/28–**IP/10**
Agenda Item 6
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International Civil Aviation Organization

INFORMATION PAPER (IP/10)

ICAO Asia and Pacific (APAC)
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(MET SG/28)

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Agenda Item 6: Research, development, and other initiatives

IMPROVEMENTS OF TAILORED MET SERVICES TO SUPPORT ATM OPERATIONS IN SOUTHERN CHINA

(Presented by China)

SUMMARY

This paper introduces the latest progress in meteorological (MET) services supporting air traffic management (ATM) and air traffic flow management (ATFM) operations in the middle-south region of China, including improvements in aerodrome real-time weather service, aviation multi-data fusion system and aerodrome warnings.

1. INTRODUCTION

1.1 The overall rainfall in the South China region has been abundant and severe thunderstorms occur frequently early this year. In April and May of 2024, the number of thunderstorm days in Guangzhou and Shenzhen airport were 20 and 21 days respectively.

1.2 In southern China, Guangzhou Baiyun Airport and Shenzhen Airport both saw significant increases in the number of flights from January to April 2024. Guangzhou Baiyun Airport had a total of 167,413 takeoffs and landings (1384 flights daily), increasing by 17.23%, while Shenzhen Airport had a total of 139,550 takeoffs and landings (1153 flights daily), increasing by 14.74%.

1.3 Adverse weather has a significant impact on aviation safety and efficiency in busy airspaces. To mitigate these impacts, considerable efforts have continuously been made to enhance meteorological services in support of air traffic management (ATM) operations.

2. DISCUSSION

Aerodrome weather observation data visual website

2.1 To enhance the quality and efficiency of MET services, a web-based visual form of weather observation data has been adopted, replacing traditional phone reporting. Through this webpage, air traffic tower and terminal controllers can obtain a clear, intuitive understanding of current weather conditions at different take-off and landing points in real-time. The new service mode effectively addresses potential misunderstandings and unclear descriptions arising from past phone reports.

2.2 Real-time meteorological elements at each runway end and intermediate points, including wind direction and speed, visibility, RVR, cloud base height, rain intensity, and weather phenomena, are provided. Variations in rain intensity directly impact aircraft take-off and landing. Air traffic controllers can quickly understand real-time changes at each runway end through this webpage and timely inform pilots of weather conditions. The precise location of adverse weather and timeliness of information enhance airport operational efficiency.

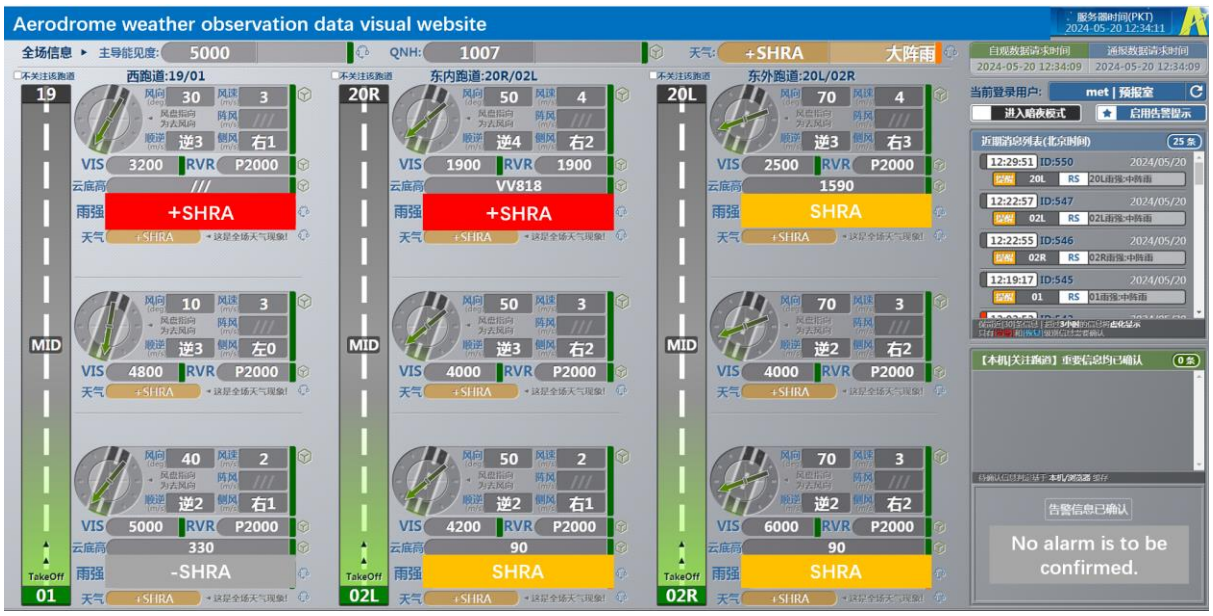

Figure 1 Aerodrome weather observation data visual website

2.3 Current assessment of rainfall intensity mainly relies on manual observation. Future research will focus on measuring and objectively evaluating rainfall intensity, reducing subjectivity.

Upgrades of aviation multi-data fusion system

2.4 The aviation multi-data fusion system, integrated with weather and air traffic data, has been in operation at the Guangzhou Air Traffic Control Centre in recent years. It displays various meteorological observation data, provides convective weather nowcasting, identifies the degree of convective weather impact, and displays real-time flight trajectories. Besides, weather briefings and consultations can be provided through this system.

2.5 The system can automatically identify convective weather impact level for the next hour with 10-minute intervals. Recent upgrades include displaying the impact level at any point in the radar coverage area and showing radar vertical profiles of chosen areas, allowing for better understanding of cloud top heights and weather impacts.

2.6 Since April 2024, a smart screen has been employed by the middle-south regional MET centre for scheduled or ad hoc coordination video conferences with aviation weather service users, including ATM, ATFM, airlines, and airport operation control centres. In these daily video conferences, the weather briefing utilizes the most up-to-date information derived from the aviation multi-data fusion system. All participants can mark and draw on the smart screen to communicate, thereby fostering enhanced interactions and facilitating a deeper understanding between forecasters and users. The close coordination plays a significant role in collaborative decision-making, as well as in making necessary flight adjustments in a timely and efficient manner.

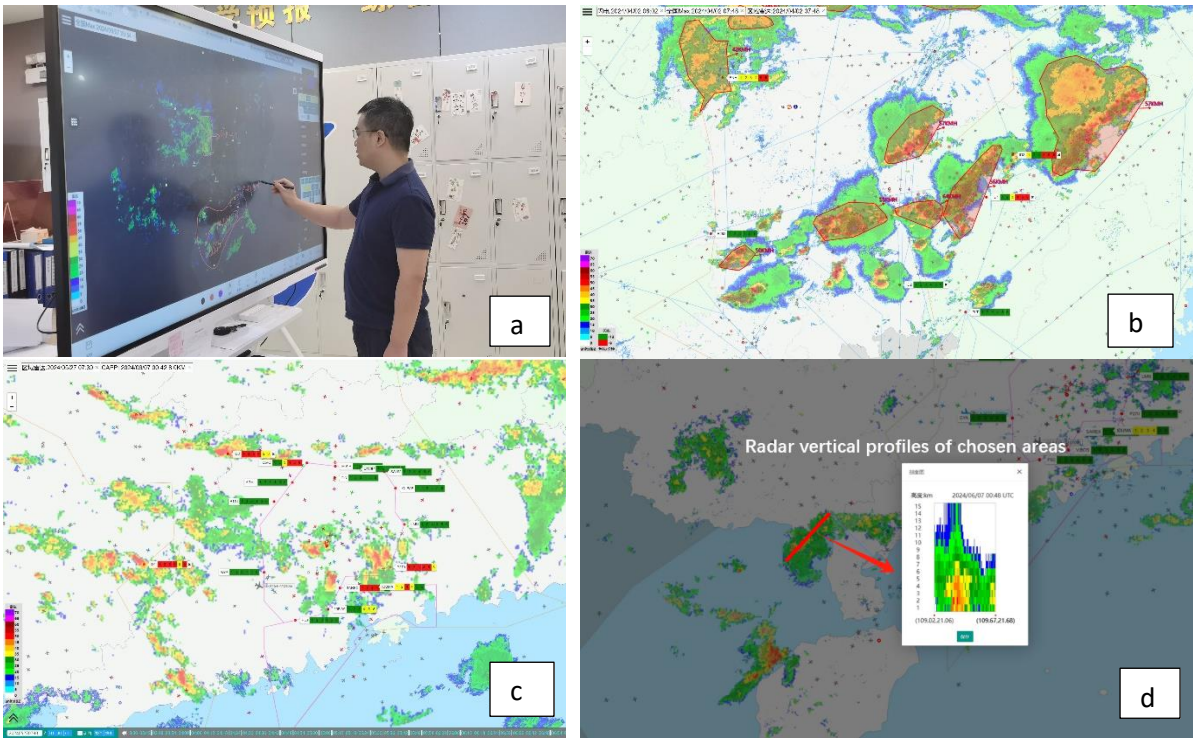

Figure 2 a) a MET-ATM video conference on the smart screen, b) aviation multi-data fusion system, c) convective weather impact identification, d) vertical cross section of convection

The visualization of aerodrome and terminal area warnings

2.7 To better illustrate information, aerodrome and terminal area warnings have been issued in a format with both images and text. These graphical warnings help air traffic controllers understand the location and movement of convection better, enhancing the common situational awareness between controllers and meteorologists. In airport warnings for ZGGG, the forecaster classifies the airport into 4 zones (A, B, C, D) to enhance precision of location descriptions. In terminal area warnings, key navigational points impacted by convection are listed, providing more practical MET information to terminal controllers.

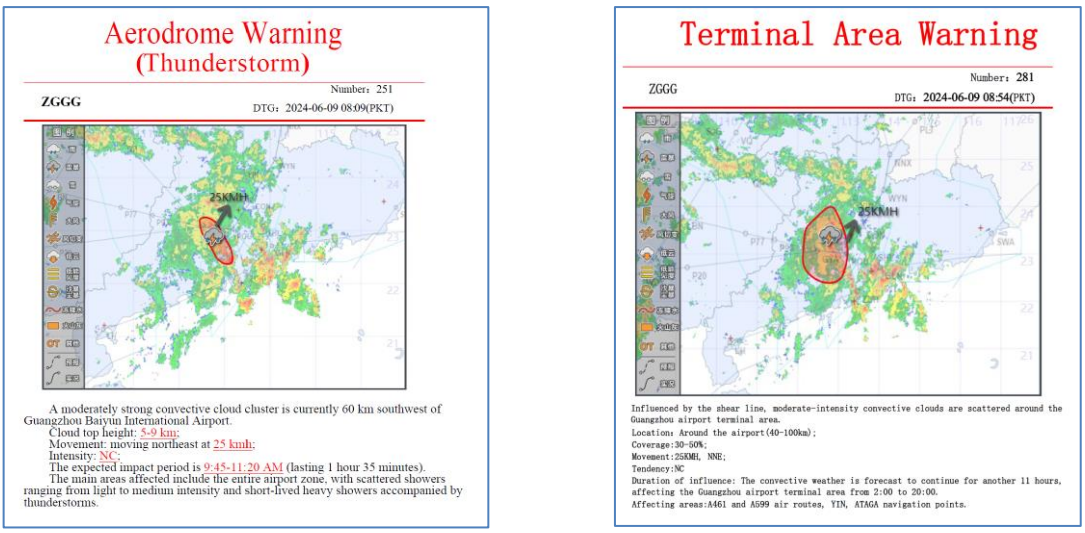

Figure 3 aerodrome and terminal area warnings with combination of the image and text

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.

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