International Civil Aviation Organization

INFORMATION PAPER

Asia and Pacific (APAC)
Eleventh Meeting of the Meteorological Requirements Working Group (MET/R WG/11)

Online, 31 May to 03 June 2022

Agenda Item 4: Collaboration between MET services and ATM stakeholders

NEW METEOROLOGICAL SERVICES TO SUPPORT THE OPERATION OF INTEGRATED AIRPORT CENTRE

(Presented by Hong Kong, China)

SUMMARY

This paper presents the aviation meteorological services and products for the new Integrated Airport Centre of the Hong Kong International Airport.

1. INTRODUCTION

1.1 The Integrated Airport Centre (IAC) of the Hong Kong International Airport (HKIA) monitors all aspects of real-time operations of the airport round the clock and responds to unexpected issues. The IAC houses the Airport Authority Hong Kong and other key stakeholders including airlines and ground service handlers. ATM and other departments integral to the operation of HKIA would also be convened to the IAC in case of emergency.

1.2 With the new IAC expected to commence operation from Q3 2022, a team of meteorologists from the Hong Kong Observatory (HKO) would station at the new IAC to strengthen current services for the aviation community. Attention would be focused on events that may cause disruptions to apron operations or adversely affect flow control, with a view to supporting early planning of relevant operators and government departments.

2. DISCUSSION

2.1 Services and products for the new IAC would be provided through a range of deliverables to facilitate effective communication of the spatio-temporal coverage of significant weather and the associated risks, with focus over the East Asian region for short and medium-haul flights.

Daily Briefings on Significant Aviation Weather

2.2 The briefings would be held every day at around 0030 UTC, back-to-back with ATC briefing through virtual meeting platform and would last for about 10 minutes. On top of an overview of the weather conditions in East Asia and the western North Pacific, significant aviation weather that

may affect HKIA, Hong Kong FIR, major flight routes and popular regional aerodromes in the short term would be highlighted. If deemed necessary, outlook of high-impact weather a few days ahead such as tropical cyclones and potential snowstorms would also be given.

2.3 Briefing materials would comprise mainly of meteorological observations, infographics and forecast products. Integrated displays of actual observations and forecast products have been designed for various weather scenarios (Figure 1). Prognosis of HKO meteorologists would make reference to in-house forecast tools, numerical weather prediction (NWP) models and forecasts issued by other centres.

Weather Tips Diagram and Summary

2.4 A Weather Tips Diagram would be prepared after each briefing and uploaded to a dedicated website for IAC stakeholders. The diagram would summarise the daily briefing graphically with some annotations. Figure 2 shows an example of the Diagram. Both upper-air and surface weather would be covered, with more focus put on surface weather since apron operations are more concerned.

HKIA Probability Table

2.5 A new HKIA Probability Table has been developed for IAC stakeholders. It would provide probabilistic forecast guidance on weather elements with particular reference to landing minima thresholds and significant weather that may affect HKIA operations, in hourly/3-hourly intervals up to 24 hours ahead. As landing minima vary across airlines, types of aircraft and competency of pilots, more than one threshold of the same weather element may be given. Users may refer to thresholds that best suit their operational needs. Probability would be presented through 5 categories (Low, Medium Low, Medium, Medium High, High), and the likelihood scale mostly follows the recommendation of the Guidelines on Communicating Forecast Uncertainty of WMO[1].

2.6 The Probability Table would be updated manually on an hourly basis during shift hours of HKO meteorologists, and such forecast would be supported by various forecast tools such as the ensemble prediction system of NWP models and machine learning techniques. In the first phase, probabilistic forecast of high temperatures, significant winds and crosswinds would be released. Figure 3 shows a prototype of the Probability Table with elements covered in the first phase. We plan to roll out other weather elements such as low visibility and windshear in subsequent phases when underlying research studies are completed.

Consultation Service and Knowledge Sharing

2.7 HKO meteorologists would be working on shifts in the new IAC from 2330 UTC to 1530 UTC (shortened to 1430 UTC if weather permits) daily. During shift hours, IAC stakeholders could approach meteorologists for enquiries, either face to face or through telephone, regarding meteorological assessment and aviation hazards over Hong Kong and neighbouring areas. Probabilistic assessment such as significant winds over specific aerodromes would also be available.

2.8 This service would be particularly beneficial to the aviation community when HKIA or HKFIR is affected by significant convection or tropical cyclones. Based on the knowledge and experience of high-impact weather over the region, HKO meteorologists would provide IAC stakeholders including ATFM personnel with the most updated assessment on the potential impact on air traffic, expected time of onset and cessation of these conditions to support early collaborative decision making on flight plan update, flight rescheduling and flow management.

[1] Guidelines on Communicating Forecast Uncertainty (WMO/TD- No. 1422; PWS- No. 18) can be accessed at https://library.wmo.int/index.php?lvl=notice_display&id=12000#.YnOPBOdByUk .

2.9 In addition, HKO meteorologists would arrange talks, seminars or group discussions to foster knowledge sharing. Topics will include general and aviation meteorology. IAC stakeholders would also be welcome to share about their concerns and operational requirements so that more tailored meteorological services could be provided in the future.

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.

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Figure 1 An integrated display of actual observations and forecast products for significant convection

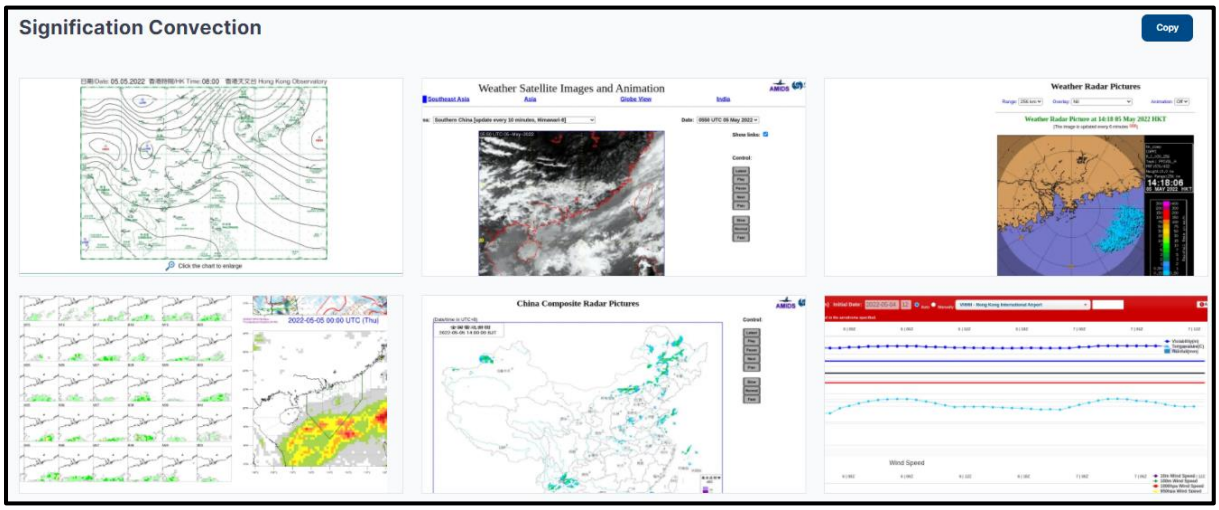

Figure 2 Example of Weather Tips Diagram and Summary on 08 March 2022

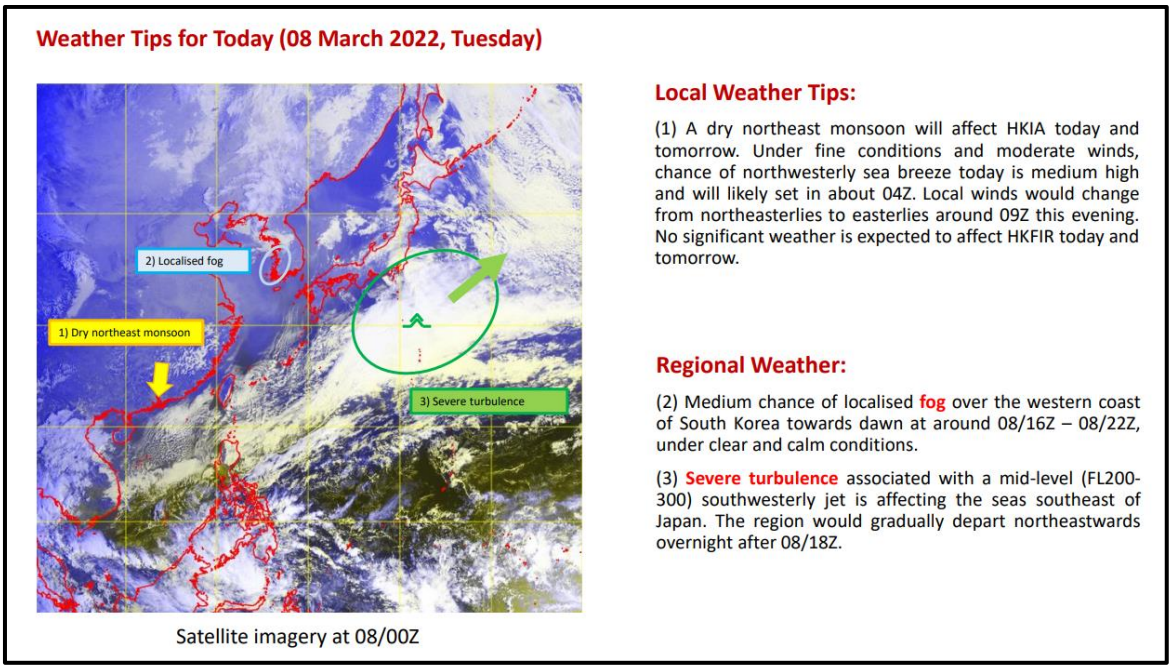

Figure 3 Prototype of HKIA Probability Table in the first phase