International Civil Aviation Organization

INFORMATION PAPER

Asia and Pacific (APAC)
Thirteenth Meeting of the Meteorological Services Working Group (MET/S WG/13)

Bangkok, Thailand, 29 to 31 March 2023

Agenda Item 3: Planning and implementation of meteorological services

PROVISION OF THREE-HOURLY TAF FOR VHHH

(Presented by Hong Kong, China)

SUMMARY

Hong Kong, China has increased the frequency of issuing TAF for the Hong Kong International Airport (VHHH) from once every six hours to once every three hours since 03Z of 8 September 2022. This paper informs the meeting of the planning, implementation and feedback regarding the service enhancement.

1. INTRODUCTION

1.1 The Airport Meteorological Office (AMO) of the Hong Kong Observatory (HKO) once issued routine TAF valid for 24 hours at six hourly intervals for the Hong Kong International Airport (VHHH). The TAF valid for 24 hours was issued at main synoptic hours, i.e., 00Z, 06Z, 12Z and 18Z while the "short" TAF valid for 9 hours was issued every three hours at both main and intermediate synoptic hours. From 5 November 2008 onwards, the valid time of TAF for VHHH issued at main synoptic hour has been extended to 30 hours and the "short" TAF issued was cancelled in accordance with Amendment 74 of ICAO Annex 3, stating that not more than one TAF is valid at an aerodrome at any given time.

1.2 Thereafter, suggestions to increase the frequency of TAF issuance to once every three hours were repeatedly raised by airline operators and pilots through customer surveys and liaison group meetings, with a view to further boosting the capacity of VHHH which already had a high traffic density, as well as better catering for flight planning.

1.3 The official proposal of issuing a three-hourly TAF for VHHH was brought up in 2018 and agreed locally among airline representatives and the Hong Kong Civil Aviation Department (Air Traffic Service). Subsequently, an internal trial run was conducted in 2018 to 2019 to evaluate the effectiveness of three-hourly TAF to aviation users and operational considerations on the proposal. Although the three-hourly TAF would be beneficial to users (especially for the first few hours of the TAF validity period), risks and opportunities have to be balanced due to additional workload brought to the Aviation Forecasters. Attention of Aviation Forecasters on continuous weather watch might be diverted, especially during the inclement weather.

1.4 Taking the opportunity of manning AMO by an additional Aviation Forecaster, the provision of three-hourly TAF for VHHH has commenced since 8 September 2022. The three-hourly TAF exceeds the requirements stipulated in ICAO Annex 3 Section 6.2.6 Recommendation.

2. DISCUSSION

2.1 While Aviation Forecasters keep TAFs under continuous review and issue amended TAF when necessary in their shifts according to the amendment criteria stipulated in ICAO Annex 3 Appendix 5, it is noted that some weather scenarios might have impact on the runway capacity of a high traffic density airport even though the amendment criteria are not fulfilled. Enhancing the regular update frequency of TAF can provide the latest trend and evolution of weather for better flight planning and air traffic control. Taking VHHH as an example, past statistics indicated that even a change in wind direction of less than 60 degrees or a wind speed of less than 10 knots could result in a significant reduction in the head wind, leading to an enlarged aircraft separation and a decrease of runway capacity. At the same time, Aviation Forecasters can provide more timely updates for weather conditions lingering around the operating thresholds of aircraft, say, visibility in the region of 1,000 metres as well as approach of significant weather (e.g. thunderstorms and severe gusts).

2.2 The internal trial run of three-hourly TAF conducted from August 2018 to October 2019 was met with satisfactory results. The three-hourly TAF led to appreciable performance improvement in the first few hours when compared with the conventional six-hourly TAF. The performance score for visibility in the first three hours was raised from 88% to 92%, and that for the precipitation was raised from 93% to 95%. This improvement was mainly due to more accurate timing and intensity of short-term weather change. The overall score (93%) verified by the objective TAF verification scheme for the three-hourly TAF was as high as that for the six-hourly TAF on the 30-hour range. It was concluded that the additional TAF updates could provide timely and accurate weather forecasts for better flight planning and air traffic control.

2.3 In order to evaluate the risk of change regarding the provision of three-hourly TAF for VHHH, the trial operation also assessed the readiness of Aviation Forecasters and all frontend and backend systems in coping with the change. All stakeholders involved were identified during the trial. The software changes in TAF preparation software, verification scheme and downstream service delivery were systematically reviewed and implemented to make sure a smooth transition from the six-hourly TAF to three-hourly TAF. After balancing the risks and opportunities, HKO concluded that three-hourly TAF would only be pursued when there would be two Aviation Forecasters manning the AMO at VHHH on a 24-hour basis.

2.4 Finally, from June 2022 onwards, AMO at VHHH has been manned with two Aviation Forecasters round the clock. The increase in manpower not only enables the provision of three-hourly TAFs, but also allows better coordination with the main centre of the Asian Aviation Meteorological Centre in the provision of hazardous weather guidance products and closer collaboration with neighbouring Meteorological Watch Offices on SIGMET coordination. As such, the official provision of three-hourly TAF at VHHH started from the bulletin issued for 03Z on 8 September 2022. The three-hourly TAF is issued at 60 minutes prior to all main and intermediate synoptic hours, i.e. the start time of the forecast validity.

2.5 Prior to the transition, HKO liaised closely with the Hong Kong Civil Aviation Department, updated necessary webpages, as well as upstream and downstream systems, informed ICAO APAC office, updated the Aeronautical Fixed Telecommunication Network (AFTN) and Aeronautical Message Handling System (AMHS) templates to prepare both TAC and IWXXM versions of TAF. The Aeronautical Information Publication GEN 3.5 Section 10.1.1 was updated accordingly, along with the upgrade of the TAF verification system to cope with the change.

2.6 Since the launch of three-hourly TAF service, positive feedback from pilots and/or stakeholders was received on various occasions. Issuing TAF for VHHH at every three hours matches the current practices in other countries, such as Australia, Canada, New Zealand, Switzerland and the USA.

2.7 Provision of three-hourly TAF is merely one of the steps on enhancing aviation weather services for VHHH. As VHHH is currently undergoing the development of the Three Runway System, the new North Runway is now separated farther away from the South Runway. Owing to subtle landscape effect, it is noted that the winds along the new North Runway could be significantly different from those at the South Runway. As such, separate Extended Take-off Forecasts (stipulated in ICAO Annex 3 Section 6.4) for the North and South Runways for a forecast range of 18 hours were launched on 7 November 2022. The forecasts take advantage of the three-hourly TAF and the half-hourly METAR (based on the wind measurements at the North Runway), as well as the in-situ wind measurements along the South Runway to highlight the wind differences for users' attention.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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