International Civil Aviation Organization

WORKING PAPER (WP/07)

ICAO Asia and Pacific (APAC)
Fourteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/14)

Bangkok, Thailand, 28 April to 2 May 2025

Agenda Item 3: Collaboration between MET and ATM stakeholders

UPDATING THE IMPLEMENTATION EXAMPLE FROM THE REPUBLIC OF KOREA IN THE REGIONAL GUIDANCE FOR TAILORED METEOROLOGICAL INFORMATION AND SERVICES TO SUPPORT ATM OPERATION

(Presented by Republic of Korea)

SUMMARY

This paper presents a proposal to update the implementation example from the Republic of Korea in the Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air traffic Management Operations by including the latest developments and illustrating the post-operational analysis work.

1. INTRODUCTION

1.1. The Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations (MET-ATM Guidance) is aimed at fostering State's implementation and enhancement of MET information and services for air traffic management operations in the region. This guidance is managed by the ad-hoc group MET/R WG, comprising members from Australia, China, Hong Kong (China), Japan (Rapporteur), Republic of Korea, Singapore, Thailand, Vietnam and IATA. The guidance material is available on the ICAO APAC website (https://www.icao.int/eDocs.aspx).

1.2. The MET/R WG/10 meeting, held in May 2021, suggested expanding the MET-ATM Guidance to define the post-operational analysis system, which can analyze the impact of tailored meteorological information on ATM decision-making.

1.3. Later in October 2021, the MET SG/25 meeting reviewed and endorsed the updated MET-ATM Guidance presented by the ad-hoc group of the MET/R WG. The updated guidance (MET ST/25 WP Appendix G) was approved, allowing States to utilize it, including updates to the format of Appendices 1 and 2, the document maintenance procedure, and the format of the ICAO APAC website.

Conclusion MET SG/25-10: Update to Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations

1.4. According to the guidance maintenance procedures, if a State wants to update the implementation case, it needs to request discussions and adoption by submitting a WP to the MET/R WG.The ad-hoc group should then consolidate the changes and obtain approval from the MET SG.

1.5. This paper suggests including the latest developments to the implementation example from the Republic of Korea in the MET-ATM Guidance.

2. DISCUSSION

2.1. The implementation case of the Republic of Korea was last updated in 2021. Since then, there have been new developments in meteorological information and service areas. The draft of the updated MET-ATM guidance implementation example from the Republic of Korea for the MET-ATM Guidance, including these latest advances, is presented in Appendix A.

2.2. The meeting is invited to review the following Decision for updating the regional guidance.

> **Decision MET/R WG/14/x: Updating the Implementation Example from the Republic of Korea in the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations**
> That the MET/R WG adopts the updated implementation example from the Republic of Korea and requests that the MET/R WG ad-hoc group consolidate it, update Appendix 1, and obtain approval from the MET SG.

3. ACTION BY THE MEETING

3.1. The meeting invited to:

a) discuss the information contained in this paper; and

b) review the adoption of the Decision in 2.2.

– – – – – – – – – – – – – – –

Appendix A

Republic of Korea

1. ATM-tailored MET Information and Services

The Ministry of Land, Infrastructure, and Transport (MOLIT) has been operating the Air Traffic Control Center (ATCC) since July 2017 to enhance flight safety and improve air traffic flow efficiency. The Aviation Meteorological Office (AMO) works 24/7 in cooperation with the ATCC, providing decision-making support for Air Traffic Flow Management (ATFM) affected by weather. The AMO also participates in Collaborative Decision-Making (CDM) meetings, offering weather information for both domestic and international airports, airspaces, and air routes, and highlighting potential hazardous weather conditions.

1.1 CDM Meetings

The ATCC holds regular CDM meetings once a day at 0010 UTC for ATFM purposes. During these meetings, the AMO provides weather briefings to all participants. In addition, if severe weather events that could significantly impact flight operations are expected within a few hours, the AMO joins irregular CDM meetings to deliver updated weather briefings.

1.1.1 CDM on Snow Events at Incheon Airport

Snowfall can lead to anti-icing/de-icing procedures and runway snow removal operations, which can affect airport capacity and air traffic flow. To prevent large-scale delays and ground congestion due to snowfall at Incheon International Airport, CDM meetings are held with participation from the ATCC, AMO, air traffic control agencies, Incheon International Airport Corporation, and airlines. During these meetings, weather analysis is shared, including updates on the likelihood of intensifying snowfall and hourly snowfall forecasts, along with an analysis of the impacts on air traffic flow.

1.1.2 CDM for Departures from Southeast Asia

When hazardous weather reduces airspace capacity over the southern region of Jeju, MET-CDM meetings are held to manage the traffic flow for flights departing from Southeast Asia and entering the Incheon FIR. Participants in these meetings include the ATCC, AMO, and air traffic control agencies, with an aviation weather analyst from the AMO providing convection forecasts and briefing on the expected hazardous weather in the Jeju sector.

1.2 Weather Briefings

1.2.1 Weather briefings for ATCC

The AMO provides weather briefings for the ATCC twice a day at 0000 UTC and 0820 UTC. The weather briefing is given during the shift change for air traffic flow managers and covers expected weather conditions at domestic and foreign airports and airspace that could affect ATFM during on their shifts.

1.2.2 Weather briefings for ACC

The AMO provides weather briefings for the Incheon and Daegu Area Control Centers (ACC) twice day at 2300 UTC and 0800 UTC. The briefing is given during the shift change of air traffic controllers and covers expected weather conditions, such as upper-level winds and convective clouds, at domestic airports and airspace during their shifts (Figure 1).

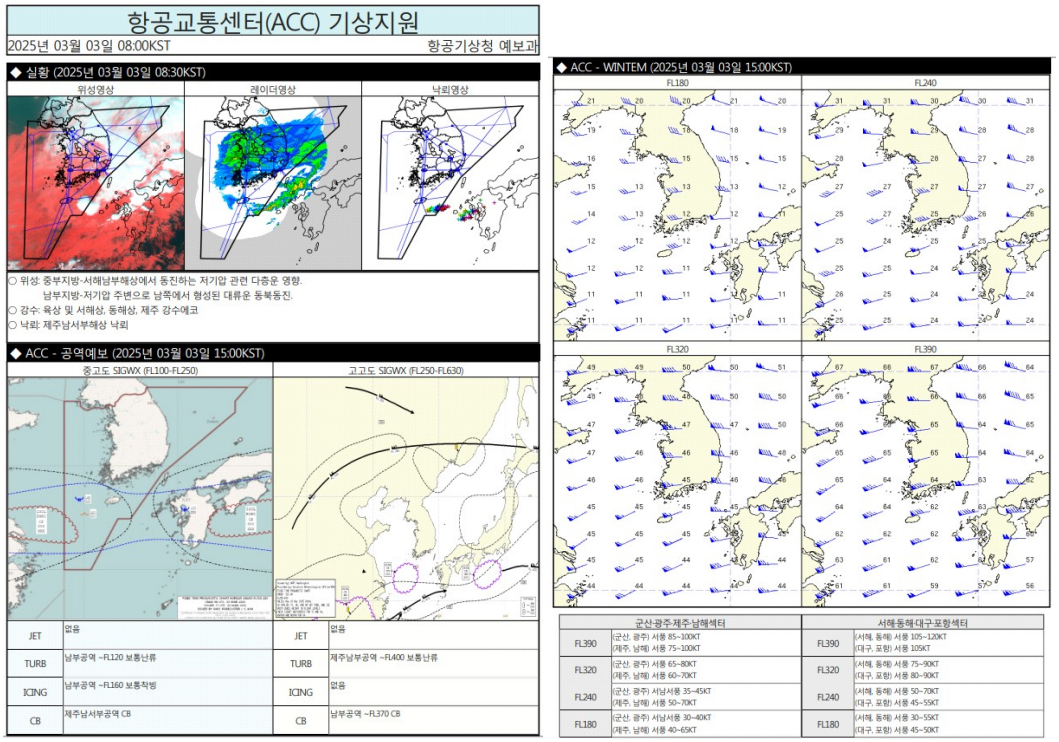

Figure 1. ACC Weather briefing

1.3 Weather Analysis (Meteorological Information) to Support ATFM

The AMO provides aviation weather analysis twice a day at 0000 UTC and 0700 UTC to assist air traffic flow management. These reports include quantitative data and graphics to enhance support for decision-making in ATFM (Figure 2).

- Target: Major domestic and foreign airports, Incheon FIR, and neighboring FIRs
- Issue Time: Twice a day at 0000 UTC and 0700 UTC.
- Modes of Provision: Flow Management Terminal (FMT) System (operated by MOLIT) and AMO website
- Content: Information on meteorological conditions expected to affect ATFM within 24 hours
  1) Detailed weather information for major airports (low visibility, strong winds, windshear, CB, precipitation/heavy snowfall, etc.)
  2) Satellite images, radar images, volcanic ash data, etc.
  3) Weather charts from numerical models, WINTEM, etc.

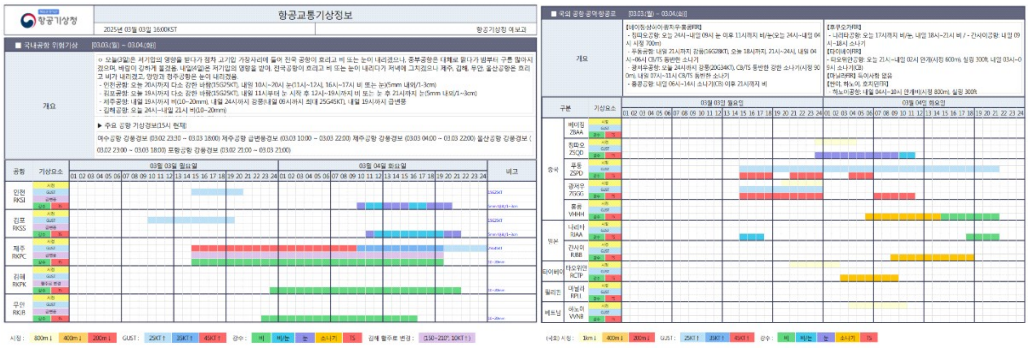

Figure 2. Weather analysis provided by AMO (twice a day) includes: ⅰ) significant weather forecasts for each airport, and ⅱ) weather graphs

1.3.1 Significant Weather Scenarios

When a typhoon, heavy snow, or low visibility with a significant impact on ATFM is expected, the AMO provides weather scenarios to support not only ATFM but also airlines' flight decisions and airport operations.

1.3.1.1 For typhoons, historical data from similar typhoons and impact-based forecasts for airports and airspace (e.g., FIX, airways) are provided. These are used to manage air traffic volume based on decisions on detour routes and to determine whether aircraft should operate (Figure 3).

1.3.1.2 For snow events, dry/wet snow information and hourly forecasts are provided to predict potential delays due to de-icing/anti-icing procedures, and these forecasts are utilized for ATFM.

1.3.1.3 For low visibility, the minimum visibility is additionally provided to minimize aircraft holding and to support low visibility operational procedures at airports.

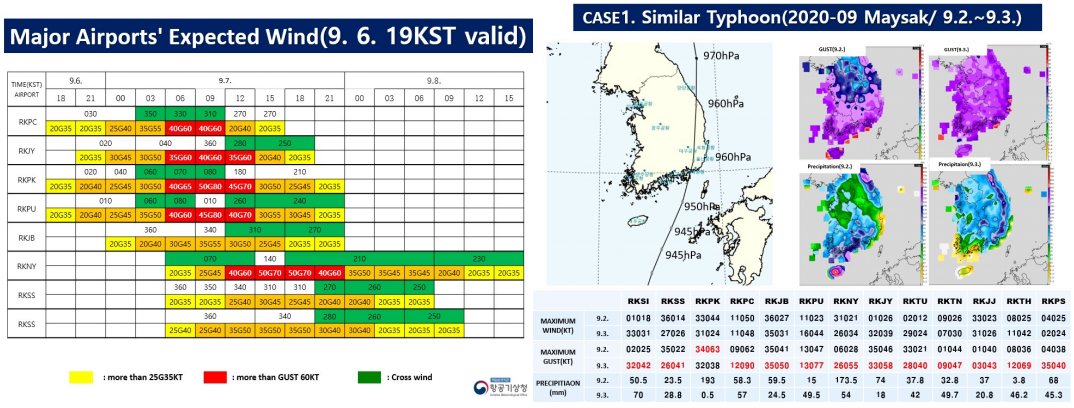

Figure 3. ⅰ) Significant Weather (Typhoon) Scenario and ⅱ) Similar Typhoons from the Past

1.4 Terminal Area Weather Service

1.4.1 Monitoring and prediction of hazardous convection

The AMO provides real-time observation data for the Incheon International Airport terminal area, including precipitation echoes, lightning, vertical wind data, precipitation types, and hail observations. Short-term precipitation forecasts (for up to two hours), based on radar observations, are also provided (Figure 4).

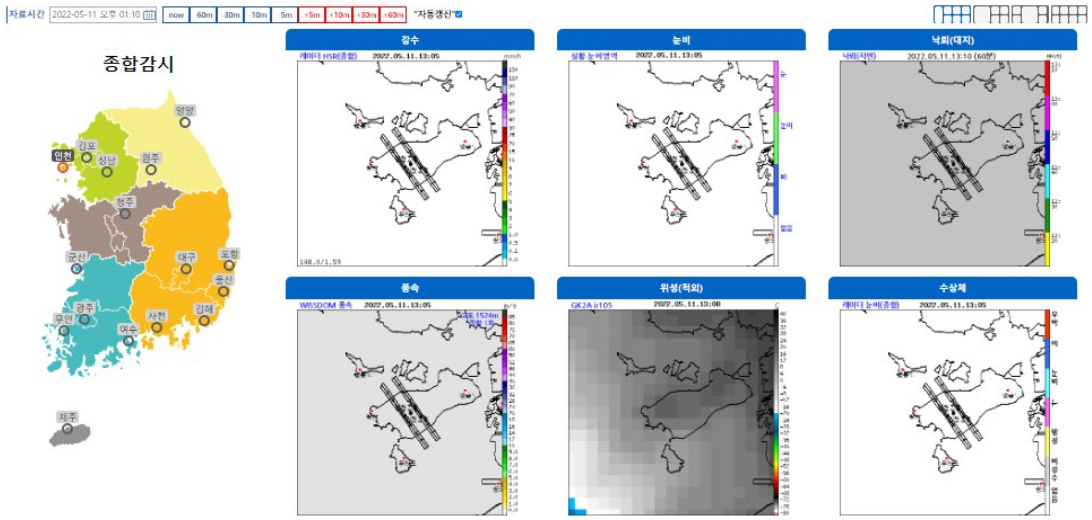

Figure 4. Interface for Monitoring and Forecasting Hazardous Convection

1.4.2 Aviation Typhoon Information Service

The AMO provides aviation-specific typhoon information to support decision-making for flight operations. Publicly available typhoon details, such as time, wind speed, and central location (latitude and longitude), are converted into units suitable for flight operations. When a typhoon is expected to enter the Incheon FIR, forecasted impacts on airports, sectors, FIX points, and air routes are provided on a time-step basis.

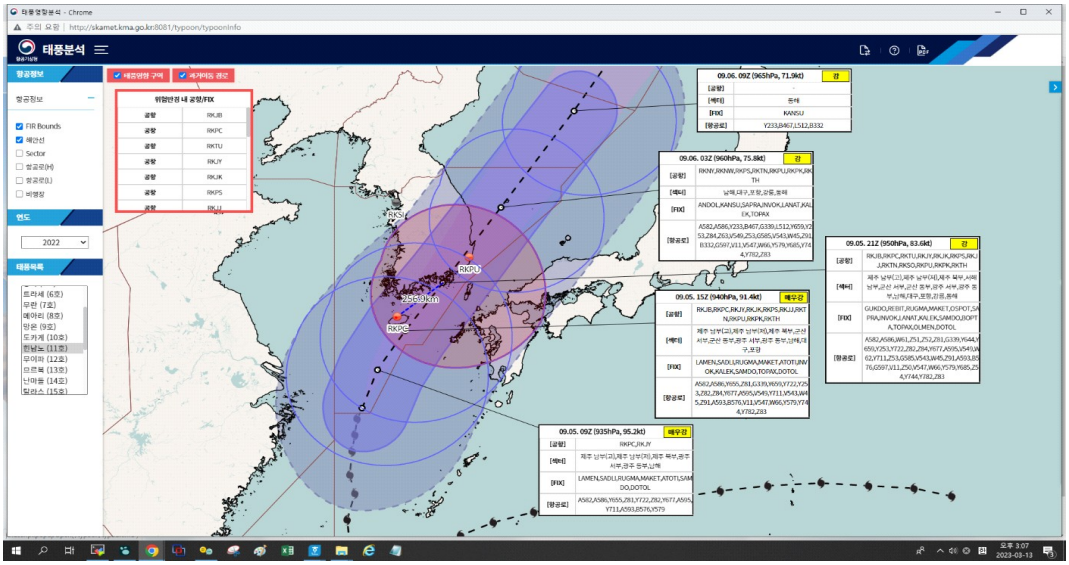

Figure 5. Interface for Aviation Typhoon Information Service

2. Modes of Provision

2.1. Flow Management Terminal (FMT) System
Aviation weather analysis reports supporting air traffic flow are provided through the FMT system operated by MOLIT.

2.2. Website
All aviation weather information issued by the AMO is available on the official AMO public website (amo.kma.go.kr) and the AMO website for aviation professionals (global.amo.go.kr).