



ICAO

*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**POST-OPERATIONAL ANALYSIS OF ATM-TAILORED MET INFORMATION**

(Presented by Japan)

SUMMARY

This paper summarizes post-operational analysis and the framework for refining meteorological (MET) information and services for air traffic management (ATM) in Japan.

1. INTRODUCTION

1.1 The Japan Meteorological Agency (JMA) set up the Air Traffic Meteorology Center (ATMetC) in Fukuoka to support the Air Traffic Management Center (ATMC) of the Japan Civil Aviation Bureau (JCAB), the core organization for ATM in Fukuoka FIR, with ATM-tailored meteorological information (see MET/ATM Seminar 2013 IP/3). JMA has also run the Tokyo Metropolitan Area Team (TMAT) as a branch of ATMetC since 2014 and the New Chitose Area Team (NCAT) since 2018 to support the operations of Traffic Management Units (TMUs) as ATMC branches conducting tactical and flexible ATFM related to airports and airspace in and around the Tokyo metropolitan area and New Chitose airport. TMAT and NCAT provide more detailed meteorological information to TMUs (see MET/ATM Seminar 2015 IP/7, MET/R WG/8 IP/12).

1.2 ATMetC forecasters provide ATM-tailored products and briefings around the clock to support ATMC officers. ATMetC also provides sequential ATMet Category Forecasts highlighting the effects of significant weather events on ATFM based on four color-coded categories.

1.3 These products and services are continually reviewed. This document describes related efforts with focus on ongoing refinement for MET information and services to support ATM in Japan.

2. DISCUSSION

2.1 ICAO Annex 3 says “Each Contracting State shall ensure that the designated meteorological authority referred to in 2.1.4 establishes and implements a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality

management of the meteorological information to be supplied to the users listed in 2.1.2.” It is also recommended that the quality system should conform to ISO 9000 family.

2.2 As ongoing refinement is a key point of ISO 9001, ATMetC operates an enhancement framework for MET information and services based on post-operational analysis and user input.

2.3 It is important to maintain records of operation on a daily basis to enable case reviews. The essential records for post-operational analysis are as follows:

- MET:
 - Daily logs
 - Contents of briefings (regular/extra, F2F/telephone/online chat, time, weather conditions)
 - Impact on air traffic flow and ATFM measures taken, as feedback from ATM (ATC capacity value, spacing time, deviation, time, location)
 - All products provided for ATM
- ATM:
 - Daily logs
 - Impact on air traffic flow (appropriate capacity value, spacing time)
 - Significant WX reports by ATC (time, weather phenomena observed by ATC)
 - Control and coordination logs for ATFM (possible/developing, measure, time, location)
 - Divert allocation results list and divert aircraft information (where applicable)
 - All products provided by MET

Post-operational analysis through regular meetings

2.4 Regular technical meetings (monthly)

- Review of adverse weather-related air traffic flow disturbances
- Sharing of reports based on independent research conducted by both organizations
- Reflection of outcomes in operations

2.5 Joint investigation reports (as required)

ATMetC produces joint investigation reports summarizing post-operational analysis and evaluation of MET information and services in coordination with ATMC officers when extreme weather conditions significantly disturb air traffic flow. In this context, ATMetC analyses weather conditions and verifies the effectiveness of briefings for use in flow control decisions made in ATM. ATM officers provide feedback regarding the effects of MET services on their ATFM operations and lessons learnt.

2.6 Joint investigation reports contains the following:

0. Summary
1. Weather phenomena affecting air traffic flow
 - 1) Synoptic-scale weather
 - 2) Details of weather phenomena (METAR/SPECI, radar, surface wind, lidar, air-reports, lightning detection system, rain, snow depth)
2. Air traffic flow control status
 - 1) Details of air traffic flow (capacity values adopted, spacing time)
 - 2) Details of flow controls implemented by ATMC (time, measures, etc.)
3. Weather briefings and products
 - 1) Contents of weather briefings (time, phenomena, expected scenario) and products
 - 2) Evaluation

2.7 ATMC holds annual meetings to discuss ATM operational policy with ATMetC, Area Control Centers (ACCs), major airports and airlines. Significant weather and resulting air traffic flow disturbance are also discussed, and valuable user feedback is obtained.

MET products verification

2.8 JMA's efforts to verify MET products for ATM include reference to the radar echo occupancy rate for areas where cumulonimbus clouds are expected. The Weather Impact Ratio (WXIR) is also effective as an index for determining meteorological effects on ATM (see ICAO APAC MET SG18 - IP/32).

Enhancement of MET information and services

2.9 Study meetings (bi-annual)

- ATMetC and ATMC exchange training for ATM-learned forecasters and MET-learned ATM officers toward efficiency in operational collaboration based on mutual understanding of operations.
- ATMetC shares expertise on significant weather phenomena affecting air traffic flow, such as cumulonimbus clouds, tropical cyclones, strong winds, heavy snow and volcanic ash.
- ATMC shares information on delays and related causes, flow control, and other matters.

2.10 ATMetC and its branches work to refine MET information and services by incorporating feedback from ATM officers and airlines based on joint reports and other input (see MET/R WG/10 IP/04 for various ATM-tailored MET information enhancements implemented by ATMetC and TMat).

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.
