

International Civil Aviation Organization

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INFORMATION PAPER**ICAO Asia and Pacific (APAC)**Twenty-Sixth Meeting of the Meteorology Sub-Group
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Online, 1 to 5 August 2022

Agenda Item 6: Research, development and other initiatives**VAAC TOKYO MANAGEMENT REPORT**

(Presented by Japan)

SUMMARY

This paper presents the VAAC Tokyo IAVW Management Report for the period 1 September 2021 through 30 June 2022.

1. INTRODUCTION

1.1 The Volcanic Ash Advisory Centre (VAAC) Tokyo is operated by the Japan Meteorological Agency (JMA), which is responsible for observing meteorological, climatological, geophysical and oceanic phenomena and issuing information accordingly as national service. The VAAC Tokyo coverage includes the East Asia, the Northwest Pacific region and part of the Arctic Circle. This report covers operations since 1 September 2021 through 30 June 2022.

2. DISCUSSIONVAAC Tokyo Operations

2.1 VAAC Tokyo issued 1804 volcanic ash advisories (VAAs) during the reporting period from 1 September 2021 through 30 June 2022 for 16 volcanoes within the VAAC Tokyo area of responsibility (AoR). Figure 1 shows the annual total number of VAAs issued by VAAC Tokyo since 2009.

2.2 VAAC Tokyo issued no VAA on behalf of VAAC Darwin for its backup operations during the reporting period. Test VAAs were provided for the Asia/Pacific SIGMET test in December 2021.

Significant Eruptions

2.3 During the reporting period, volcanoes in the Kamchatka Peninsula and the Kuril Islands, such as Bezymianny, Chikurachki, Ebeko, Karymsky, Klyuchevskoy and Sheveluch actively erupted; some of these events with volcanic ash expanding across Northern Pacific (NOPAC) routes or towards Pacific Organized Track System (PACOTS) routes affected aviation operations. Among these events, a series of eruptions of Bezymianny (23 to 29 May 2022) was estimated to reach up to FL500.

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2.4 Active volcanoes in Japan, such as Sakurajima and Suwanosejima also erupted. VAAC Tokyo issued the largest number of VAAs (1186) for Suwanosejima in VAAC Tokyo AoR during the reporting period.

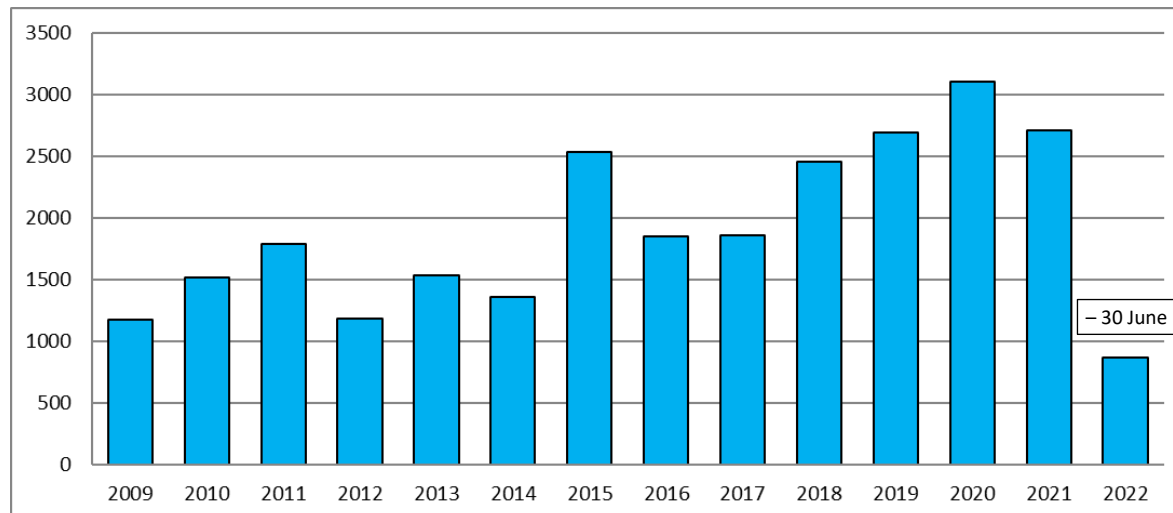


Fig. 1 Annual total number of VAAs issued by VAAC Tokyo from January 2009 to June 2022.

Significant Operational and Technical Changes

2.5 VAAC Tokyo uses the “Volcanic Ash advisory and ash fall Forecast distribution System” (hereafter, VAFS) for volcanic ash analysis, forecasting, and create/disseminate products. This system was updated in March 2021 and is currently being operated as VAFS2. The Centre issues VAAs in IWXXM format through VAFS2 from the end of March 2022.

2.6 JMA had operated global and regional atmospheric transport models (JMA-GATM for VAAs and JMA-RATM for volcanic ash fall forecasts, respectively). By integrating these models, the Japan Meteorological Agency Atmospheric Transport Model (JMA-ATM) was newly developed and started operating in March 2021. Its processes consist of advection, diffusion, gravitational fallout, dry deposition, rainout, and washout and so on. The new JMA-ATM was designed from the points of view of robustness, promptness, flexibility and manageability.

2.7 JMA-GATM and JMA-RATM had different eruption scales that they are good at. Using different vertical coordinates throughout their development made them somewhat inflexible. To solve this issue, JMA-ATM unifies the models by converting the grid-point values to identical z-coordinates.

VAAC Backup between Tokyo and Darwin

2.8 VAAC Tokyo and VAAC Darwin concluded a mutual backup cooperation scheme in March 2014; VAAC Tokyo provides backup operations for the area north of 20 degrees south in VAAC Darwin AoR, and VAAC Darwin provides backup operations for VAAC Tokyo AoR. The VAACs modified the scheme on 12 May 2022 to ensure smooth backup operations. In accordance with the modified scheme, the annual backup test between two VAACs will be conducted in July 2022. During the reporting period, VAAC Tokyo performed no backup operations.

VONA issuance drills with PHIVOLCS

2.9 VAAC Tokyo and the Philippine Institute of Volcanology and Seismology (PHIVOLCS) resumed VONA issuance drills in May 2022, that were suspended due to COVID-19 pandemic. In this drill, VAAC Tokyo asked two volcano observatories of PHIVOLCS to send a test VONA within 10 minutes without advance notice. This drill helps VAAC Tokyo to issue VAAs triggered by VONA information promptly and precisely for real eruptions.

Future Development

2.10 VAAC Tokyo is currently under consideration for developing the Quantitative Volcanic Ash concentration information (QVA), taking into account its implementation schedule. As part of the QVA development, the Centre currently develops an Eruption Source Parameter model that takes into account the physical dynamics of the ash column, such as advection, density currents and particle settling, to obtain initial parameters for JMA-ATM.

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.
