International Civil Aviation Organization

INFORMATION PAPER (IP/20)

ICAO Asia and Pacific (APAC)
Twenty-Ninth Meeting of the Meteorology Sub-Group (MET SG/29)

Bangkok, Thailand, 18 to 22 August 2025

Agenda Item 6: Research, development and other initiatives

VAAC LONDON QVA API

(Submitted by VAAC London)

SUMMARY

This paper gives an update on the introduction of the London Volcanic Ash Advisory (VAAC) Quantitative Volcanic Ash (QVA) API.

1. INTRODUCTION

1.1 With Amendment 82 to ICAO Annex 3 - *Meteorological Service for International Air Navigation* and the first edition of ICAO Doc 10157 – PANS-MET a new quantitative volcanic ash forecast provision is introduced.

1.2 VAAC London has completed their development activities, and their QVA is now available as a "soft launch". This means that whilst the system is fully operational, the QVA data itself cannot be for operational decision making until 27 November 2025.

1.3 VAAC Toulouse's QVA API[1] will follow will follow soon, with the remaining 7 VAAC's expected to launch their QVA APIs in late 2026.

2. DISCUSSION

QVA Data

2.1 Quantitative Volcanic Ash (QVA) forecasts provide higher resolution information on the location of ash in the atmosphere than the traditional VAA. QVA also offers operators the opportunity to move away from traditional discernible/visible ash criteria and instead use certified engine susceptibility volcanic ash concentrations for flight route planning and inflight replanning. Operators with approval and procedures/practices will be able to use QVA information to fly more efficient routes while maintaining safety in accordance with their safety management program.

[1] Application Programming Interface

2.2 VAAC London is responsible for issuing advisories for volcanic eruptions originating in Iceland and the north-eastern corner of the North Atlantic, and will provide forecast ash plumes that cover the entire ash plume however large that gets.

2.3 The QVA information service comprises of three data sets:

- The expected ash concentration as a gridded data set.
- The probability of the ash exceeding four different concentration thresholds (≥0.2mg/m^3, ≥2.0mg/m^3, ≥5.0mg/m^3 and ≥10.0mg/m^3) as a gridded data set.
- Features/objects, in IWXXM format, that show the expected ash areas for where ash exceeding the four concentration thresholds (≥0.2mg/m^3, ≥2.0mg/m^3, ≥5.0mg/m^3 and ≥10.0mg/m^3) is expected to occur.

2.4 The gridded data sets will be provided for twelve vertical slices of the atmosphere between the ground and 60,000ft (Flight level 600), each 5000ft thick. The IWXXM objects represent a subset of the gridded data with each spanning the minimum to maximum height for a given threshold. All the data sets will be provided covering the period from T+0 hour to T+24 hours at 3-hourly intervals from the time they are issued and will be updated every 6 hours while a significant ash cloud remains.

2.5 QVA forecasts will only be issued for "significant" eruptions, which for the VAAC London area of responsibility is expected to be any eruption emitting ash, due to how busy the north Atlantic airspace is. (it will not be issued for the effusive type eruptions that have been occurring periodically on the Reykjanes peninsula in Iceland over since 2024).

2.6 The QVA service does not provide visualized data, but illustrative plots that VAAC London has created from the QVA data are shown in in figures 1, 2 and 3.

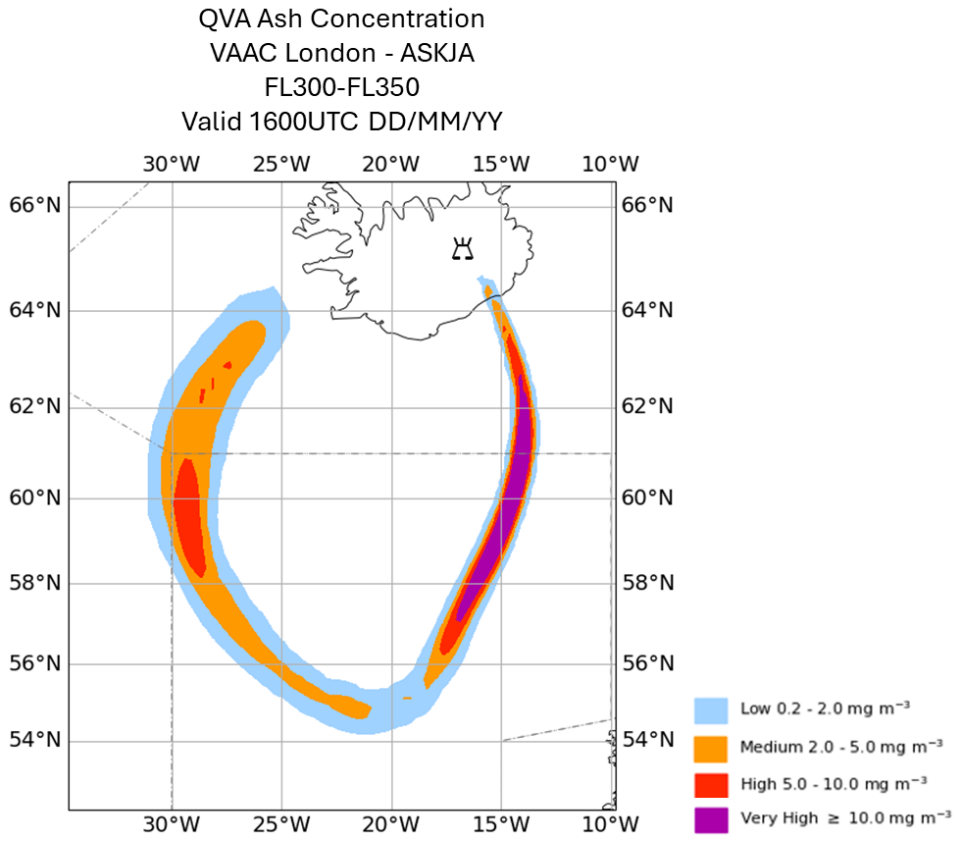

Figure 1 – example deterministic ash plume coming from a volcano erupting in Iceland

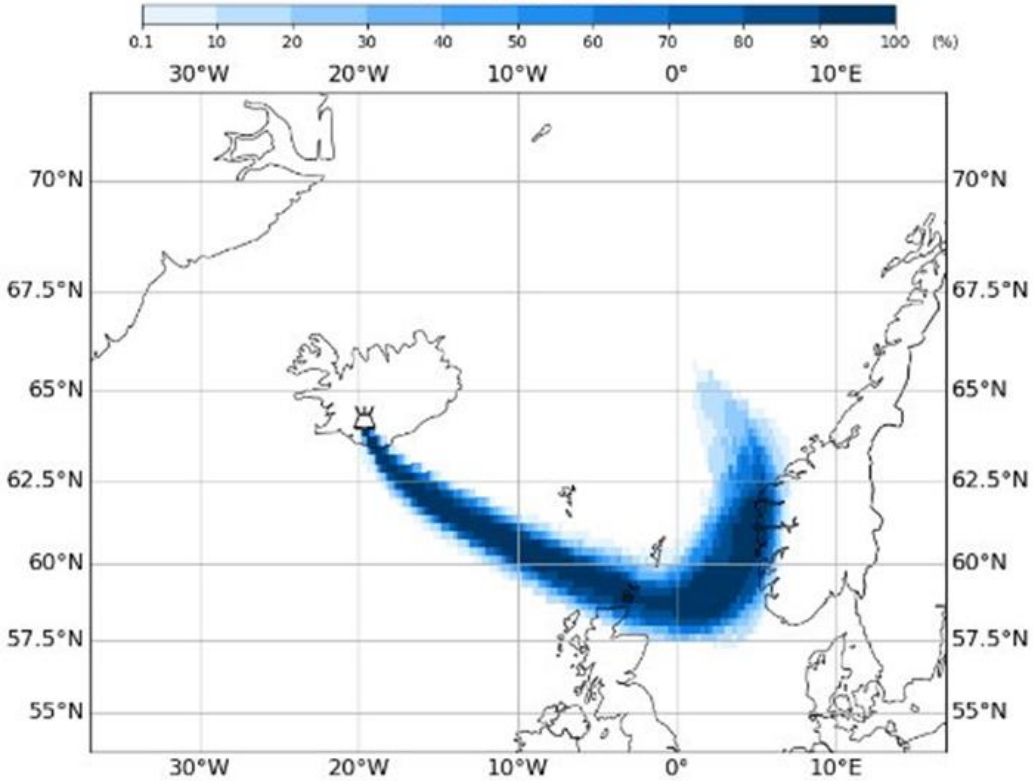

Figure 2 – example probabilistic ash forecast, for the 0.2g/m^3 threshold. The darker the blue colour, the higher the probability of the specific ash threshold being exceeded

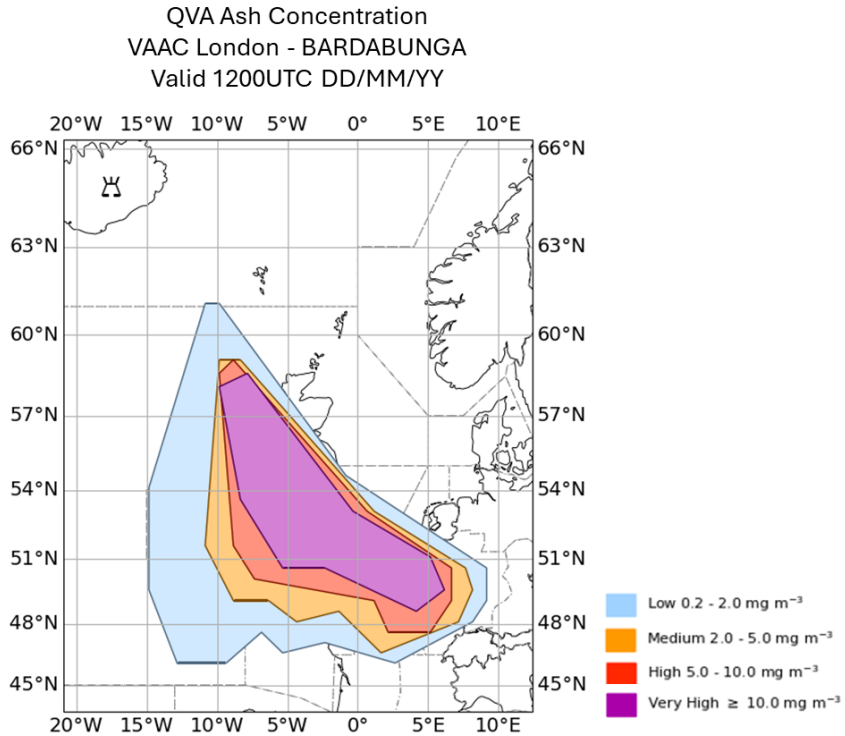

Figure 3 - Display of IWXXM features. Stacking polygons like this can produce a chart in which the colour bands equate to the four thresholds. Each polygon however strictly indicates the boundary of the area that has an ash concentration which the four thresholds

VAAC London QVA API

2.7 In accordance with the ICAO Global Air Navigation Plan (GANP) (Doc 9750) https://www4.icao.int/ganpportal/ the VAAC London QVA API has been built in accordance with the System Wide Information Management (SWIM) requirements. SWIM consists of Standards, Infrastructure and Governance, enabling the management of Air Navigation Services related information and its exchange between qualified parties via interoperable services.

2.8 The VAAC London QVA API is provided in accordance with UK SWIM policy and standards and the Met Office will seek compliance sign off in due course. The API also conforms to the EUROCONTROL SWIM 'Yellow Profile' technical specification https://www.eurocontrol.int/publication/eurocontrol-specification-swim-technical-infrastructure-ti-yellow-profile and uses the Open Geospatial Consortium (OGC) Environmental Data Retrieval (EDR) API framework https://ogcapi.ogc.org/edr/.

2.9 As eruptions in the VAAC London area of responsibility are infrequent, a notifications service has been built that can be subscribed to. This notifications service will publish a message whenever new data sets are published on the main API. Specific technical information on the API is available in the VAAC London QVA API user guide.

2.10 The VAAC London QVA API is now available for registrations for the aviation industry, and providers of services to the aviation industry. To register, please take a look at: https://www.metoffice.gov.uk/services/transport/aviation/regulated/international-aviation/vaac/qva/qva-api for further information. Users will need to accept the service terms and conditions and fill in a registration form that can be obtained from QVA@metoffice.gov.uk.

2.11 There are no geographical restrictions the use of the API, and registrations from the APAC region are encouraged.

2.12 VAAC London will be running two webinars in November which MET SG/29 attendees, and aviation industry organizations are invited to attend. The links below allow self-registration.

- **3 November 2025 15:30 – 17:00 UTC:**
  https://events.teams.microsoft.com/event/20d98167-19d5-4e91-93a6-0a6dad6268fd@17f18161-20d7-4746-87fd-50fe3e3b6619
- **11th November 09:00 – 10:30 UTC:**
  https://events.teams.microsoft.com/event/391cce07-067c-4e7d-9139-9843a3f7b2a1@17f18161-20d7-4746-87fd-50fe3e3b6619

3. ACTION BY THE MEETING

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

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