

International Civil Aviation Organization**ICAO****INFORMATION PAPER****ICAO Asia and Pacific (APAC)**Twenty-Sixth Meeting of the Meteorology Sub-Group
(MET SG/26)

Online, 1 to 5 August 2022

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

(Presented by New Zealand)

SUMMARY

The paper presents a management report for the VAAC Wellington covering the period 1 July 2021 to 30 June 2022. It provides an update on current activities, significant operational changes, training and development and collaboration. It also provides an overview of recent backup tests with VAAC Darwin.

1. INTRODUCTION

1.1 Volcanic Ash Advisory Centre (VAAC) Wellington, operated by the Meteorological Service of New Zealand Limited (MetService) covers the region southward from the Equator and from E160 to W140, except for the Melbourne and Brisbane FIRs, and southward from S10 and from W140 to W90.

1.2 This paper presents a summary of key operational items within VAAC Wellington's area of responsibility between 1 July 2021 and 30 June 2022.

2. DISCUSSIONVAAC Wellington Operations

2.1 A total of 172 Volcanic Ash Advisories (VAA) and accompanying Volcanic Ash Graphics (VAG) were issued for the Wellington area of responsibility over the period of this report. Of these, 93% of VAA/VAG issued were relating to actual volcanic ash events or VAAC backup notices, which are detailed below, in Figure 1.

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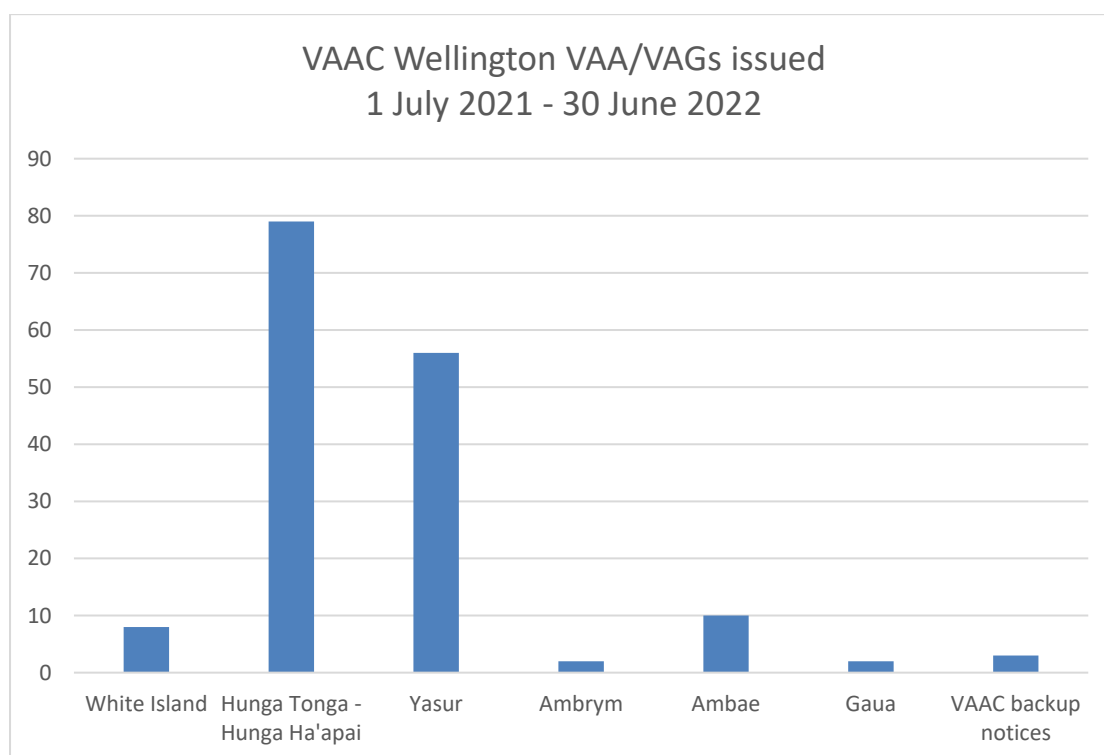
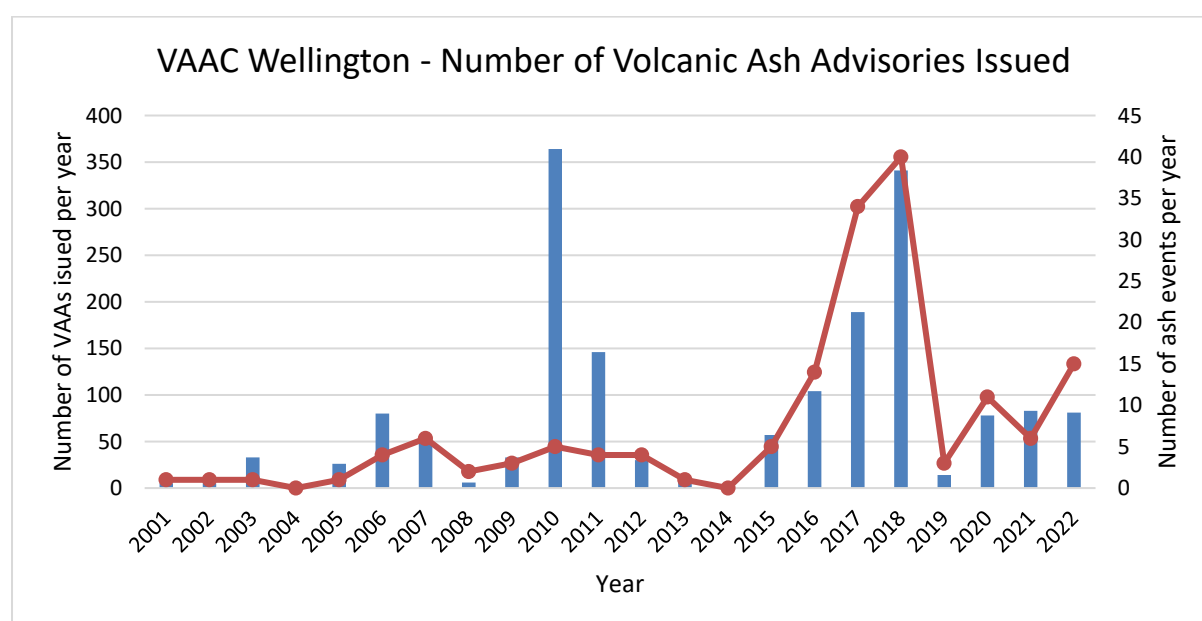


Figure 1 Operational VAA/VAG and backup notices issued by VAAC Wellington for 1 July 2021 – 30 June 2022

2.2 Figure 2 shows the number of operational VAAs issued by the VAAC each year, along with the number of individual volcanic eruption events¹ dealt with. Although the 2022 numbers in Figure 2 only cover half the annual reporting period, 2022 has already had more individual eruptive events than the previous three full years. Most of these events occurred in January and of these, most were related to the Hunga Tonga – Hunga Ha'apai eruptions. The number of VAAs issued per volcano is summarized in Appendix A to this paper.



¹ The number of events is counted by the number of final (operational) VAAs issued for volcanic ash.

Figure 2 Number of operational events and advisories per year. Note, 2022 only contains information through to 30 June.

2.3 The majority of VAA issued over the reporting period were issued between 20 December 2021 – 18 January 2022 for the eruptions of the Tongan volcano Hunga Tonga – Hunga Ha’apai. The first two weeks covered intermittent eruptions between FL100 through to FL400, with two major eruptions on the 14th and 15th of January 2022. The eruption on 14th January 2022 was to FL500-550, while the 15th January 2022 eruption went into the stratosphere, possibly even higher based on post event reviews. This significant eruption resulted in a multi-polygon VAA affecting multiple flight information regions (FIR). VAACs Wellington and Darwin closely collaborated during this event, which tested many VAAC and aviation procedures, before the stratospheric component of the volcanic cloud moved away towards the VAACs Toulouse/Darwin border.

2.4 A post event review of the Hunga Tonga – Hunga Ha’apai eruption was conducted across multiple aviation agencies in New Zealand. One recommendation from this review was to consider the practice of issuing an ‘initial SIGMET’ as an initial alert for eruptions within the Auckland Oceanic (NZZO) FIR – already standard practice within the New Zealand (NZZC) FIR. This recommendation has been accepted and now a standard operating procedure for both the NZZC and NZZO FIRs. The initial SIGMET will include the volcano name and location and may not include ash height or horizontal extent, as this information may not yet be known. It will include the mandatory VA SIGMET elements to ensure ICAO compliance. Once the full VAA is available, the SIGMET will be updated. Once the Volcano Observatory Notice to Aviation (VONA) has been elevated to a recommended practice (expected November 2024), the practice of issuing an initial SIGMET for the NZZC and NZZO will be reviewed.

2.5 On 1 December 2021, VAACs Wellington and Darwin completed their annual backup test as described in the VAAC Darwin and Wellington Backup Test paper presented to the conjoint session of MET/IE WG20 and MET/S WG12. A second backup test was conducted on 16 June 2022, to test a fix which allows VAAC Wellington to issue products on behalf of VAAC Darwin, mimicking the VAAC Darwin bulletin header. This fix eliminates the reliance on Airways NZ to disseminate the product on VAAC Wellington’s behalf and was successfully proven in this test.

Competencies, Training and Development

2.6 VAAC Wellington finalised the assessment of VAAC specific competencies in July 2021, and several forecasters outside of the core VAAC forecasting team have successfully completed this process, creating greater resilience across the entire forecasting team, with around 30 meteorologists now assessed as competent. This allows the VAAC to increase staffing during high impact events.

2.7 An improved Volcano Monitoring Tool for internal use was released in November 2021. The tool provides a central location to access monitoring tools, including webcams, NOAA/CIMSS observations, satellite imagery, lightning data and links to internal procedures. Further updates are being investigated to include VOLCAT alert email to the tool.

2.8 VAAC Wellington has maintained resilience during the COVID-19 pandemic by continuing to split operations across multiple offices in Auckland, Wellington, and Christchurch, alongside increasing forecaster capability to working from home.

Collaboration and Stakeholder Engagement

2.9 Over the past couple of years, VAAC Wellington has been assisting Tonga Meteorological Service (TMS) with the Tonga ICAO MET deficiency concerning information on volcanic activity not being regularly provided (AP-MET-17). TMS had the opportunity to show their improvement for

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VONA issuance when Hunga Tonga – Hunga Ha’apai began erupting in late December 2021. During the period 20 December 2021 – 15 January 2022 TMS issued around 53 VONA, which included very useful information for the forecasting team.

2.10 VAAC Wellington continue to support VAAC Darwin and the Solomon Islands Meteorological Service (SIMS) in helping SIMS address long-standing ICAO SIGMET deficiencies. This included holding a weeklong ‘offline’ pre-test, followed by a ‘live’ exercise 30 September 2021. A second exercise was conducted 20 April 2022, followed by an online debrief workshop on 24 May 2022. Further assistance will continue throughout 2022, and updates will be provided at subsequent meetings.

2.11 VAAC Wellington and the New Zealand State volcano observatory, GNS Science, continue to work closely together with regularly scheduled meetings three times per week. The close relationship was proven valuable during the Hunga Tonga – Hunga Ha’apai eruptions in December 2021/January 2022, with the organisations sharing information and expertise during the event. Both agencies also collaborate on volcanic ash modelling, with a focus on ashfall for GNS Science.

2.12 VAACs Wellington and Darwin continue to communicate regularly using Microsoft Teams Chat. The Chat is used operationally to share information and knowledge about eruptions, pass along information around VAA issuance, as well as request backup services if required. We have encountered some issues trying to share files or video through Teams Chat and are working along VAAC Darwin to trial a slightly different approach within Microsoft Teams to share these more easily.

2.13 VAAC Wellington, with the VAAC Wellington Manager being a member of the ICAO Meteorology Panel Working Group Meteorological Operations Group (METP WG-MOG) workstream on the International Airline Volcano Watch (IAVW), continues collaborating on activities such as key performance indicators to enhance consistency and accuracy of forecasts; elevation of the Volcano Observatory Notice for Aviation (VONA) status into ICAO Annex 3; as well as progression of the Roadmap and ConOps documentation.

3. ACTION BY THE MEETING

3.1 Note the information contained in this paper.

APPENDIX A

The number of advisories per volcano or backup/exercise issued by VAAC Wellington during the period 1 July 2021 – 30 June 2022.

Volcano	Date	VAAs/VAGs issued
Whakaari/White Island	2-3 September 2021	5
	14 October 2021	3
Hunga Tonga – Hunga Ha’apai	20 December 2021 – 3 January 2022	53
	14 – 18 January 2022	26 (incl. rebroadcast)
Yasur	22 October 2021	11
	27 November 2021	6
	27 December 2021	7
	15, 17 and 18 January 2022	7
	12, 17 and 19 February 2022	16
	9 and 11 April 2022	9
Ambrym	25 January 2022	2
Ambae	12 and 17 Feb 2022	10
Gaua	3 May 2022	2
VAAC backup notices	3 September, 8 December 2021, 10 March 2022	3
Exercise notices	17 August 2021	1 (Pacific MWO Test)
	30 September 2021	4 (2 Simba, 2 Tinakula)
	20 April 2022	4 (2 Simba, 2 Tinakula)
ICAO APAC SIGMET test	15 December 2021	1
Darwin VAAC Backup Test	1 December 2021	1
	16 June 2022	1