International Civil Aviation Organization

INFORMATION PAPER

Asia and Pacific (APAC)
Twelfth Meeting of the Meteorological Services Working Group (MET/S WG/12)

Web-conference, 30 March to 1 April 2022

Agenda Item 6: Guidance and education related to the provision of meteorological services

VAAC WELLINGTON MANAGEMENT REPORT

(Presented by New Zealand)

SUMMARY

This paper presents an International Airways Volcano Watch (IAVW) focused management report describing activities for the Volcanic Ash Advisory Centre (VAAC) Wellington, covering the period 1 July 2021 to 31 January 2022.

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 31 January 2022. Further information can be requested of the VAAC separately.

2. DISCUSSION

2.1 VAAC Wellington has between 30 and 35 VAAC competent staff available, which includes meteorologists from across the forecast operations team. The team mostly operate out of our main offices in Auckland and Wellington. We have also been increasing our capacity for forecasters to 'work from home'.

2.2 VAAC Wellington finalised 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.

2.3 A total of 129 Volcanic Ash Advisories (VAA) and accompanying Volcanic Ash Graphics (VAG) were issued for the Wellington area over the period of this report (Table 1). 95% of VAA/VAG issued were operational, relating to actual VA events or VAAC backup notices (Figure 1.)

Table 1 All

Volcano	Date	VAAs/VAGs issued
Whakaari/White Island	2-3 September 2021 14 October 2021	5 3
Yasur	22 October 2021 27 November 2021 27 December 2021 15, 17 and 18 January 2022	11 6 7 7
Ambrym	25 January 2022	2
Hunga Tonga – Hunga Ha'apai	20 December 2021 – 3 January 2022 14 – 18 January 2022	53 26 (inc rebroadcast)
VAAC backup notices	3 September, 8 December 2021	2
Exercise notices	17 August 2021 30 September 2021	1 (Pacific MWO Test) 4 (2 Simba, 2 Tinakula)
ICAO APAC SIGMET test	15 December 2021	1
Darwin VAAC Backup Test	1 December 2021	1

VAA/VAG issued by VAAC Wellington for 1 July 2021 – 31 January 2022

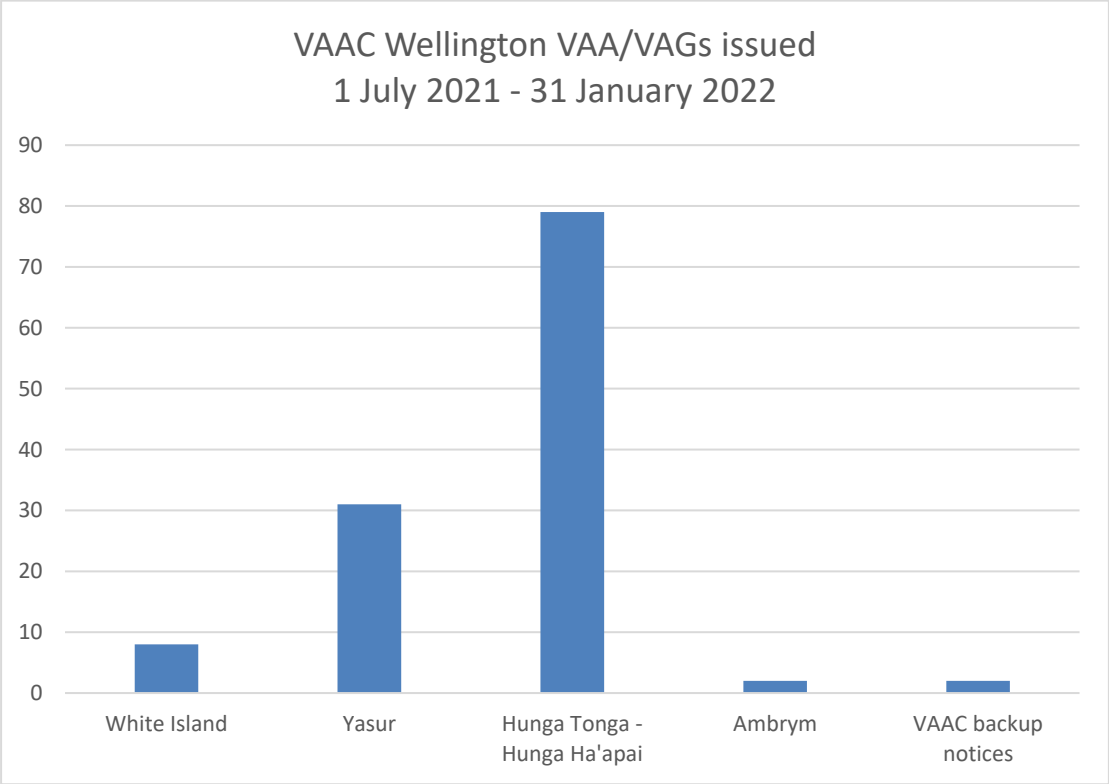

Figure 1 Operational VAA/VAG issued by VAAC Wellington for 1 July 2021 – 31 January 2022

2.4 After nearly a 6-year period of inactivity, Hunga Tonga-Hunga Ha'apai erupted on 20th December 2021 to approximately FL200. For the next two weeks, Hunga Tonga-Hunga Ha'apai continued to erupt intermittently between FL100 through to FL400. A total of 53 VAA were issued during this period.

2.5 On 14th January 2022 Hunga Tonga-Hunga Ha'apai erupted to FL500-550. A total of 9 VAA were issued for this event.

2.6 On 15th January 2022, at 0410 UTC Hunga Tonga-Hunga Ha'apai erupted into the stratosphere, possibly even higher based on post event reviews. This significant eruption resulted in a multi-polygon VAA affecting multiple VAACs. 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. A total of 17 VAA were issued for this event by VAAC Wellington, including 4 rebroadcasts of VAAC Darwin VAA that affected the VAAC Wellington area of responsibility.

2.7 Below is an imagery of the Hunga Tonga – Hunga Ha'apai eruption on 15 January (Figure 2).

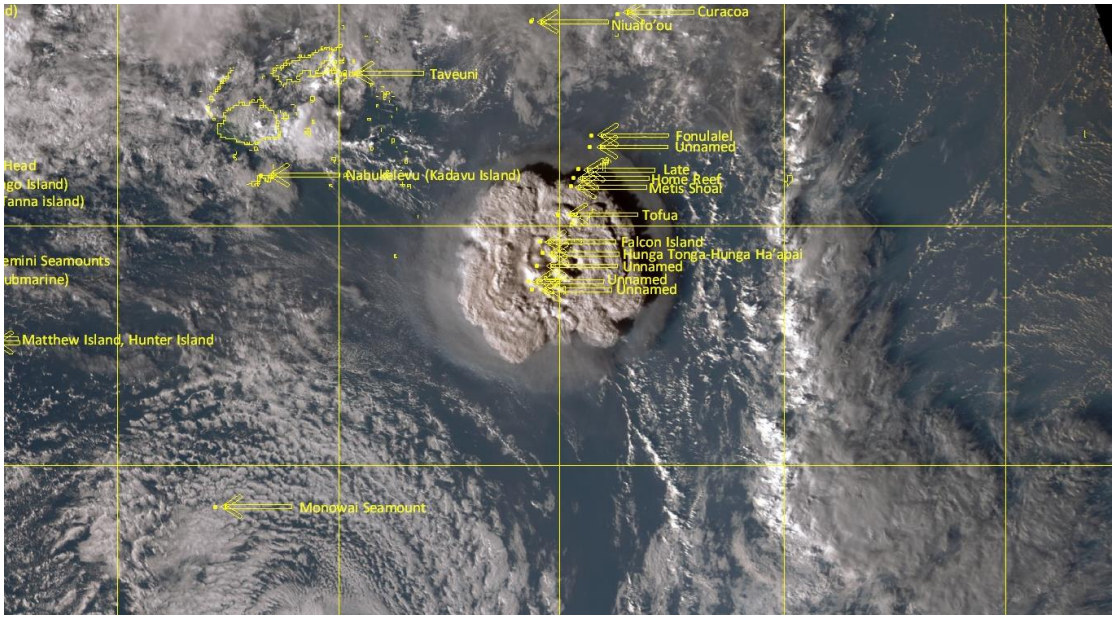

Figure 2 Himarwi-8 True Colour satellite imagery, 15/0510Z – 1hr after the massive eruption

2.8 A review of the Whakaari-White Island eruption event in September 2021 led to a change in process of the formatting of the 'Initial SIGMET' in the NZZC. The Initial SIGMET is a point observation SIGMET alerting users to the volcanic eruption observation, issued while the VAAC dispersion model is running, intended to provide an early heads-up to users who may not receive the initial VAA. The new SIGMET format is in line with recommendations from VOLCEX 19/01 and removes the plain text section ("more information to follow") which is not ICAO Annex 3 compliant and hence not possible to disseminate in IWXXM format.

2.9 A post event review of the Hunga Tonga – Hunga Ha'apai eruption is being conducted across multiple aviation agencies in New Zealand. Part of this review will discuss whether the practice of a point observation SIGMET should be adopted for eruption within MWO Wellington's NZZO FIR as well.

2.10 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.

2.11 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.

2.12 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 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.

2.13 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 debrief for the exercise was going to be hosted online but was cancelled due to unavoidable circumstances. Further assistance will continue into 2022, and update provided at subsequent meetings.

2.14 VAAC Wellington and the New Zealand SVO, GNS Science, continue to work closely together with regularly scheduled meetings three times per week, especially sharing information and expertise during the unprecedent Hunga Tonga – Hunga Ha'apai eruptions in December 2021/January 2022. Both agencies also collaborate on volcanic ash modelling, with a focus on ashfall for GNS Science.

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

2.16 On 1 December 2021, VAACs Wellington and Darwin completed their annual backup test as described in the separate paper supplied to the MET/S WG/12.

2.17 VAAC Wellington, with the VAAC Wellington Manager being a member of the ICAO Meteorology Panel Working Group Meteorological Operations Group (METP WG-MOG) work stream 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.

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