



**MET PANEL (METP)
MET OPERATIONS GROUP (MOG)
VOLCANIC ASH (VA)**

SECOND MEETING

Buenos Aires, Argentina, 27 to 28 April 2016

Agenda Item 6: VAAC Management Reports

**VAAC WELLINGTON MANAGEMENT REPORT
DECEMBER 2013 – FEBRUARY 2016**

(Presented by New Zealand)

SUMMARY

Pursuant to Conclusion 1/2 of the IAVWOPSG/1 Meeting, VAAC Provider States were invited to provide a concise IAVW management report to be presented at every IAVWOPSG meeting covering the period elapsed since the previous meeting and addressing the main features of the international airways volcano watch (IAVW) operations, highlighting any recent developments and difficulties and future planned developments. This report covers the operations of the Wellington VAAC for the period of December 2013 to February 2016.

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 The Wellington VAAC works closely with GNS Science (Geological and Nuclear Sciences), who are responsible for volcano monitoring in New Zealand. Wellington VAAC also works closely with the Vanuatu Meteorology and Geo-Hazards Department who are responsible for monitoring volcanoes across the Vanuatu region. The VAAC also communicates with other meteorological and air traffic service organisations across the Pacific region when seeking confirmation of volcanic activity.

2. OPERATIONS OF THE VAAC

2.1 Issuance of Volcanic Ash Advisories in the VAAC Area

2.1.1 During the period 1 December 2013 to 29 February 2016, a total of 67 volcanic ash advisories (VAAs) and accompanying volcanic ash graphics (VAGs) were issued. The VAAs were issued for 3 separate volcanoes, all located in the Southwest Pacific Ocean. No VAAs were issued from December 2013 to December 2014, while 57 were issued during 2015. For the 2016 calendar year until the end of February, 10 VAAs have been issued. Of the VAAs issued during the reporting period, 35 (52%) were issued for the Ambrym volcano situated in Vanuatu.

In summary:

Volcano	Country	Date	VAAs/VAGs issued
Hunga Tonga-Hunga Ha'apai	Tonga	6– 13 January 2015	29
Yasur	Vanuatu	19 February 2015	3
Ambrym	Vanuatu	21– 24 February 2015	17
Ambrym	Vanuatu	8 July 2015	3
Ambrym	Vanuatu	22– 23 August 2015	5
Ambrym	Vanuatu	7– 8 February 2016	4
Ambrym	Vanuatu	18– 19 February 2016	6

2.2 Significant eruptions in the VAAC area of responsibility

2.2.1 Volcanic unrest for the Hunga Tonga- Hunga Ha'apai volcano began during December 2014 and continued into January 2015. On the morning of 6 January, the Wellington VAAC received the first reports of an eruption, and issued the first VAA/VAG at 05/2140UTC. A total of 29 VAA/VAGs were issued for this event, which oscillated between ash and steam emissions. All volcanic activity appeared to have subsided by around 24 January 2015. During that period there was frequent communication between Wellington VAAC duty forecasters, Tonga Meteorological Services, Tonga Air Traffic Control, airlines and GNS Science. GNS Science volcanologists were able to travel to the site of the volcano during this period of unrest and provide the Wellington VAAC with improved ash observations for inclusion into volcanic ash forecasts. GNS Science also spent the time on the island educating the pilots and ATC personnel, with the aim of better future observations for the Wellington VAAC.

2.2.2 The Wellington VAAC has remained operational for the reporting period, aside from an outage during October 2014, when there was no volcanic activity in the Wellington VAAC area of responsibility, so no formal handover to the Darwin VAAC was required.

3. OTHER ACTIVITY OF INTEREST

3.1 Wellington VAAC released IBL's Visual Weather software for producing volcanic ash graphics and advisories into operations on 3 June 2015.

3.2 A new volcanic ash modelling system has been implemented, built around the HYSPLIT model driven with NWP from three different models: IFS, GFS and WRF. Eruption parameters (duration, plume height and mass eruption rate) are provided from a set of defaults, spanning a range or eruption size, for each volcano. Parameters for NZ volcanoes have been provided by GNS Science, while the remainder are taken from the USGS eruption parameter database – until observations of the

eruption become available to specify these. The system is operated through a web interface, which allows simulations to be triggered by forecasters simply and quickly, and also provides graphical output of mass loading. Further visualisation is provided through integration with Visual Weather, which allows easy comparison with satellite observations. This was put into production when the Wellington VAAC released Visual Weather into operations.

3.3 The implementation of Himawari-8 satellite data into Wellington VAAC operations on 26 August 2015 has allowed for enhanced volcanic ash monitoring, with the creation of new RGB volcanic ash monitoring products. Wellington VAAC would like to acknowledge the Darwin VAAC for their assistance in setting up this capability in Visual Weather. Wellington VAAC is using the RGB products to look at ash events both inside and outside the Wellington area of responsibility. This is to grow the experience of the VAAC forecasters and also help to strengthen the backup capability of the Wellington VAAC with the Darwin VAAC.

3.4 Wellington VAAC is now receiving alerts from the NOAA/CIMMS volcanic ash, volcano thermal anomaly and volcanic CB cloud alerts from 23 October 2015. This alert system has proven very useful in heightening forecaster awareness of possible volcanic activity in the Wellington VAAC area of responsibility.

3.5 As agreed at VAAC Best Practice (Anchorage) meeting on 17 October 2015, a “Confidence in T+0 VA Polygon” statement was introduced into Wellington VAAC procedures on 3 December 2015.

4. EXTERNAL RELATIONS

4.1 GNS Science and the Wellington VAAC have continued to foster a close relationship, with significant cooperation between the MetService Forecasting Research group and GNS Science research volcanologists in volcanic ash modelling. Close collaboration also continues between the Wellington VAAC and the Vanuatu Meteorology and Geo-Hazards Department, with regular information sharing regarding activity of the Vanuatu volcano group. The eruption parameters that GNS Science assume for NZ volcanoes have been included as defaults in the Wellington VAAC dispersion modelling system. Also, collaboration is underway on improving the GNS Science ash fall product by using the MetService’s HYSPLIT-based system.

4.2 Meetings between Wellington VAAC forecasting team and Air New Zealand’s Flight Despatch Centre continued during 2015, to ensure that the VAAC forecasters remain aware of the impacts that volcanic ash forecasts have on flight operations.

4.3 MetService attended the Australian Bureau of Meteorology’s annual “Vulcan-Aus” meetings in Brisbane in August 2014 and in Melbourne in August 2015. The purpose of the meeting is to discuss issues relating to the impact that volcanic ash has on aviation. MetService provided presentations on Wellington VAAC activities at both meetings, with a summary of changes to VAAC forecasting operations.

5. WELLINGTON VAAC BACK-UP ARRANGEMENTS

5.1 With the release of Visual Weather into Wellington VAAC operations, the Wellington VAAC gained the capability to provide a backup service to the Darwin VAAC for their area south of 20S. The first test of the back-up operation is planned for April 2016.

6. STATUS OF SMS

6.1 MetService maintains a quality management system (QMS) to the AS/NZS ISO9001:2008 Management System Standard. MetService is now implementing a safety management system (SMS) and is currently in the planning phase.

7. FUTURE DEVELOPMENTS

7.1 The T+24hr volcanic ash graphic production is now in the test phase. It is planned that the Wellington VAAC will operationally implement this by the end of 2016.

8. IAVW PARTICIPATION

8.1 VAAC Wellington attended the Best Practice meeting held in London 4-8 May 2015 and WMO 7th International Workshop on Volcanic Ash 19-23 October 2015.

8.2 VAAC Wellington acted as an observer during the VOLPHIN16/01 volcanic ash exercise and expects to participate in a VOLPHIN exercise in August 2017.

9. ACTION BY THE METP-WG/MOG

9.1 The METP-WG/MOG is invited to:

- a) Note the information contained in this Report.

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