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Agenda Item 14: Regional preparations for the MET Divisional Meeting (2002)

VOLCANIC ASH WARNINGS IN NEW ZEALAND

(Presented by New Zealand)

SUMMARY

This paper provides information about the provision of volcanic ash advisories and warnings in New Zealand.

1. Introduction

1.1 There are a number of active volcanoes in and near New Zealand. Two of these - Mt Ruapehu and White Island - have erupted on several occasions during the past few years, affecting aircraft operations.

1.2 Mt Ruapehu, located in the centre of New Zealand's North Island, is 2,979 metres high, while White Island, located approximately 50 kilometres offshore to the northeast of the North Island, is only 371 metres high. A map showing the location of these volcanoes is provided in the attachment.

1.3 During 1995 and 1996, Mt Ruapehu was particularly active with several eruptive events which resulted in volcanic ash being sent up to a height of 12 kilometres. White Island has also erupted on several occasions over the past year or so, but these eruptions have been smaller and of shorter duration with some volcanic ash reaching heights of 2 to 3 kilometres.

1.4 The eruptions of Mt Ruapehu in 1995 and 1996 resulted in many flights being cancelled, diverted or re-routed, and one or two aircraft sustained damage to windscreens and engines after penetrating ash cloud. International civil aviation procedures and information systems were available to cover these volcanic events. However, a number of issues arose during the 1995 and 1996 eruptive episodes that highlighted a need to develop a more effective monitoring and volcanic ash warning system for New Zealand. The New Zealand Civil Aviation Authority (CAA) initiated action in 1996 that resulted in the development of the New Zealand Volcanic Ash Advisory System (NZVAAS), which was implemented in 1999. The general outline of the NZVAAS is given below.

2. NZVAAS

2.1 There are currently nine Volcanic Ash Advisory Centres (VAACs) around the world, including the Wellington VAAC in New Zealand. The VAACs provide volcanic ash advisories in accordance with the procedures detailed in Chapter 3 of Annex 3. The Wellington VAAC was implemented in 1995 and is operated by Meteorological Service of New Zealand Ltd (MetService) under a formal agreement with the CAA, which is also New Zealand's ICAO designated meteorological authority.

2.2 The NZVAAS is an enhancement of the Wellington VAAC. The NZVAAS involves the co-ordinated interaction of aircraft operators and four organisations including the CAA, MetService, Airways Corporation of New Zealand Ltd (ACNZ), which is the Air Traffic Services provider in New Zealand, and the Institute of Geological and Nuclear Sciences (IGNS), New Zealand's volcanological authority. There are formal agreements between these organisations in relation to the NZVAAS, and the role and responsibilities of each organisation, and the aircraft operators, are clearly defined.

2.3 The NZVAAS provides information on volcanic ash to aircraft operators to allow them to plan and manage their flights in proximity to volcanic ash. The information provided includes volcanic ash advisories in the format prescribed in Annex 3, NOTAMs, satellite imagery, ash trajectory information, vertical wind profiles and graphical information.

2.4 The NZVAAS has proven to be a very effective system for New Zealand and this can be attributed largely to the formal arrangements involving the organisations referred to in 2.2 above. It has also highlighted the importance of having an appropriate and co-operative arrangement between the meteorological service provider and the local volcanological organisation. In New Zealand, IGNS provides MetService with advice on possible future eruptions as well as detailed information on volcanic activity during all volcanic events. Similarly, MetService provides selected information to IGNS to support their ash detection, monitoring and ash modelling activities.

2.5 Further information about the NZVAAS is provided in IP/30.

3. Issues

3.1 Volcanic Ash Advisories

3.1.1 Experience with the issue of volcanic ash advisories (VAAs) in New Zealand has highlighted the difficulty on occasions of providing detailed information about volcanic ash in both textual and graphical formats. This can be a significant issue when eruptions from a particular volcano are continuous or quasi-continuous over a period of time, and when wind direction varies with height causing ash to move in different directions with height. Depicting this information graphically (for VAAs and SIGMETs) has proven to be almost impossible on occasions, and describing the information in textual messages has often resulted in lengthy and very complex messages.

3.1.2 A revised ICAO format for providing VAAs was implemented on 1 November 2001, coinciding with the effective date of Amendment 72 and the Fourteenth Edition of Annex 3. The new format is more codified than previously in order to cater for the transmission of VAAs over Datalink. It is now also a requirement to include forecast ash cloud information for + 6, 12 and 18 hours in the VAAs. However, this has proven to be difficult to cope with operationally in New Zealand, especially in situations like those referred to in 3.1.1. Because of this difficulty, New Zealand currently issues forecast ash cloud information for + 12 hours only.

3.2 Volcanic Ash SIGMETs

3.2.1 VAACs issue volcanic ash advisories to designated Meteorological Watch Offices (MWOs) to assist them with the preparation of the 12-hour outlooks included in volcanic ash (VA) SIGMETs. However, some MWOs do not always include the relevant VAA information in the VA SIGMETs they issue. This problem has been recognised in the ICAO Asia and Pacific Regions, and Conclusion 11/33 of APANPIRG outlines the need for a SIGMET Special Implementation Project to consider this matter further and to seek possible solutions.

3.2.2 When the VAAs were first introduced it was the intention that these should be distributed primarily to MWOs. However, over time the required distribution of VAAs has been

extended to include area control and flight information centres, other VAACs, WAFCs, international OPMET data banks, international NOTAM offices and airlines. The distribution of VAAs directly to airlines has resulted in a number of airlines operating in New Zealand airspace questioning whether there is a need for both a VAA and a VA SIGMET. Although the VAAs are intended to provide preliminary advice about volcanic ash pending the issue of a VA SIGMET, several airlines have indicated that their needs for information about volcanic ash could be met by receiving VAAs only. This poses the question of whether the relationship between a VAA and a VA SIGMET should be reviewed, and indeed whether the issue of VAAs and VA SIGMETs results in an unnecessary duplication of information.

4. **Action by the Meeting**

4.1 The meeting is invited to

(a) Note the information provided in this paper; and

(b) Exchange views on the issues outlined in the paper.

This map shows the location of the Mt Ruapehu and White Is volcanoes in New Zealand. The location of another active volcano, Mt Ngauruhoe, is also shown.