



International Civil Aviation Organization

**SEVENTEENTH MEETING OF THE METEOROLOGY  
SUB-GROUP (MET SG/17) OF APANPIRG**

Bangkok, Thailand, 13 – 16 May 2013

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**Agenda Item 5: Regional Implementation of International Airways Volcano Watch (IAVW)**

**WELLINGTON VOLCANIC ASH ADVISORY CENTRE –  
INDUSTRY FUNDED ENHANCEMENTS**

(Presented by New Zealand)

**SUMMARY**

This paper presents an overview of the recently agreed to Industry funded enhancements to the Wellington Volcanic Ash Advisory Centre.

**1. Introduction**

1.1 On behalf of the New Zealand Civil Aviation Authority (CAA), Meteorological Service of New Zealand (MetService) operates the ICAO-designated Wellington Volcanic Ash Advisory Centre (VAAC). The Wellington VAAC is one of nine centres providing global coverage for the production and dissemination of advisory information regarding volcanic ash in the atmosphere. The Wellington VAAC is provided as part of a contract with the CAA covering the provision of services to international aviation to meet New Zealand's meteorological obligations under the Convention.

1.2 The management and technical challenges facing the Wellington VAAC in 2012/2013 were different from those it faced in December 2010 when the cost of services, previously funded by the CAA, was transferred to Airline operators through their individual contracts with MetService.

1.3 Given the three key components of a robust VAAC programme are observations, numerical models and skilled meteorologists, the Wellington VAAC was at risk of being unable to effectively meet its commitments without additional investment.

1.4 In late 2012, working closely with Industry representatives and the New Zealand CAA, MetService reviewed its resource requirements for the Wellington VAAC. It presented a case to the New Zealand aviation community, proposing a change of approach coupled with a sustainable funding model, designed to ensure full capability and delivery of VAAC service aligned with current best practice and likely future requirements. The case for change was supported.

1.5 Given the challenging nature of the prevailing commercial environment, aviation community support for the changes was a significant achievement. It highlights a very good level of co-operation and collaboration between the regulator (CAA), the aviation community and the service provider (MetService), based on a clear understanding of the critical significance of VAAC services and the benefits of adequate resourcing.

## 2. Discussion

2.1 Key areas requiring improvement, identified from the VAAC Best Practices Workshop February 2012, included:

- (a) Satellite applications are a critical, and rapidly changing, aspect of VAAC operations, and the challenge to stay at the cutting edge with respect to data access and application of ash detection algorithms.
- (b) During complex events, such as Cordon-Caulle or the Icelandic events, co-ordination between the VAACs to ensure consistency across boundaries requires significant effort, and would benefit from a more formalised approach to data exchange.
- (c) Most VAACs are staffed by meteorologists who have other operational duties. Recent challenging events (Iceland events, Cordon-Caulle) seriously stretched VAAC resources, suggesting that the typical operational model was no longer appropriate.
- (d) The sophistication of ash dispersion and trajectory modelling is advancing rapidly with access to large modelling centres. Excellent, low-cost, options are available to VAACs, but these still require a significant resource commitment to remain current.
- (e) Availability of suitable backup arrangements (regional) and preparedness to deploy those backups were areas of weakness for most VAACs.

2.2 The nature of the agreed resourcing and support based on agreed aviation community funding and effective from 1 July 2013 includes.

- (a) Implementation of dedicated full time Meteorologist support, applied to VAAC professional development activities such as:
  - development of forecasting techniques,
  - backup testing, liaison with stakeholders including operators and other VAACs, staff training; and
  - engagement in IAVWOPSG ad hoc working groups<sup>1</sup>.

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<sup>1</sup> It is accepted by the aviation community that during major events additional staff need to be drawn from other parts of MetService's forecasting operation; however, on past experience MetService expects such events to be of short enough duration, and sufficiently infrequent, to accept this limitation.

- (b) Implementation of modelling support allocation from MetService's Forecasting Research team, for the purpose of ongoing development of ash dispersion and trajectory modelling, as well as providing enhanced operational modelling support during active volcanic periods. This includes a fixed annual charge to cover the cost of appropriate computing hardware for testing and operational modelling
- (c) Formalisation of observing support through the clear allocation to the VAAC of one third of the cost of MetService implementing and maintaining reception and processing equipment for polar-orbiting satellite data, to enable access to current and future high-resolution data and ash detection algorithms.
- (d) Formalisation of management support through the allocation of fixed annual costs to cover attendance at relevant international forums the cost of staff time for meeting preparation and appropriate participation in relevant ad hoc or working groups (excluding participation of dedicated full time meteorologists).
- (e) Clear specification of IT and infrastructure support through the allocation of a fixed annual cost. This cost covers the expected average annual investment in IT for VAAC development and support based on historical costs and anticipated changes to ICAO requirements, along with internal development to improve VAAC capability. This also includes an agreed allocation of overhead costs associated with maintenance and support of MetService's core data management infrastructure.
- (f) Implementation of a full back-up arrangement with the Australian Bureau of Meteorology (Darwin VAAC).

2.3 New Zealand has agreed to provide a reciprocal backup for that portion of the Darwin area of responsibility that lies south of latitude 20S, subject to arranging sufficient resources to be able to do this. This will also incorporate an obligation for both parties to provide appropriate training and data to support the arrangement, and to engage in routine testing to ensure its effectiveness.

2.4 With CAA support, MetService has decided to implement a solution from a commercial Software Engineering company for delivering the VAAC backup capability. Once installed, MetService will work closely with the Australian Bureau of Meteorology in drafting appropriate backup procedures. This will involve a number of formal tests within an operational forecasting environment and a thorough review of procedural documentation by both the Wellington and Darwin VAACs.

2.5 MetService's Forecasting Research team will be tasked with developing an ash dispersion and trajectory solution covering the Darwin VAAC area. This will form part of the wider programme of work around modelling support mentioned above.

### **3. The Charging Methodology**

3.1 Suitable methodologies for the allocation of charges to cover the enhanced VAAC and associated costs were widely discussed with the aviation community.

3.2 An initial proposal was to utilise a levy-based approach, incorporating charges in the existing Air Navigation Service Provider (ANSP) en-route charging mechanisms. The en-route charge covers all New Zealand based international and domestic traffic as well as all international traffic transiting through the New Zealand domestic and Auckland Oceanic FIRs.

3.3 While a conceptually straight-forward methodology, the above approach could not cover aircraft operations across all of the Wellington VAAC area. That area is much larger than the New Zealand FIRs and, as with other VAAC regions, it covers many FIR's of neighbouring States.

3.4 Ultimately the aviation community representatives decided that a charging methodology based on flight activity and aircraft type for flights originating or terminating within the New Zealand FIRs, regardless of flight duration, was least administratively burdensome and their favoured option.

3.5 However, it was noted and accepted by the aviation community that this methodology was still not entirely equitable with flight's transiting the Wellington VAAC region and the New Zealand FIRs would continue to receive VAAC services without a direct charge<sup>2</sup>.

#### **4. Action by the Meeting**

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

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<sup>2</sup> The CAA notes that the issue of equitably charging for meteorological services covering regions or the globe will become acute over time.