



International Civil Aviation Organization

WORKING PAPER

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(Information paper)

English only

ASSEMBLY — 39TH SESSION

TECHNICAL COMMISSION

Agenda Item 37: Other issues to be considered by the Technical Commission

VOLCANIC ASH IMPACTS ON AVIATION OPERATION

(Presented by Indonesia)

EXECUTIVE SUMMARY

This paper presents a volcanic ash procedures exercise and contingency ATS Route involving the relevant service providers and airspace users in Indonesia region.

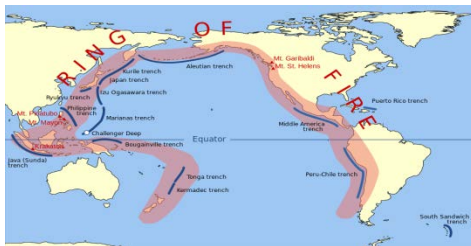
<i>Strategic Objectives:</i>	This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
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<i>Financial implications:</i>	
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<i>References:</i>	Annex 3 — <i>Meteorological Service for International Air Navigation</i> Doc 9766, <i>Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List</i> Indonesia Civil Aviation Safety Regulation (CASR) Part 174, Aeronautical Meteorological Information Services item 174.65 (http://hubud.dephub.go.id/?id/kepmen/download/884)
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1. INTRODUCTION

1.1 Indonesia is the country that contains the most active volcanoes of all countries in the world. Located in The Eurasian Plate, Pacific Plate and Indo-Australian Plate are three active tectonic plates that cause the subduction zones that form these volcanoes. Indonesia is estimated to have 129 volcanoes, all carefully observed by the Centre of Volcanology and Geological Hazard Mitigation (Pusat Vulkanologi dan Mitigasi Bencana Geologi), because a number of Indonesian volcanoes show continuous activity.



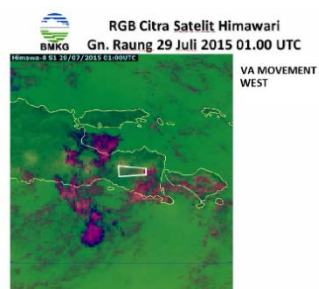
1.2 Guidance material for conducting volcanic ash procedures and exercises in ICAO Regions was included in 2010 in the *Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List* (Doc 9766) (para 4.11 and Appendix F refer), stating that " an exercise directive should be published prior to the exercise which clearly describes the exercise scenario, participating agencies and any special instruction".

1.3 In accordance with Indonesia Civil Aviation Safety Regulation (CASR) Part 174 concerning Aeronautical Meteorological Information Services item 174.65 - the process for handling the impact of volcanic ash is described below.

2. DISCUSSION

2.1 The information regarding pre-eruption phase, start of eruption phase, ongoing eruption phase and recovery phase before an issuance of SIGMET has delivered to stakeholders in the form of Modelled Ash Concentration charts and to deliver its updates every 6 hours or as needed. The charts are an estimation of the spread of volcanic ash clouds in low, medium and high contamination areas.

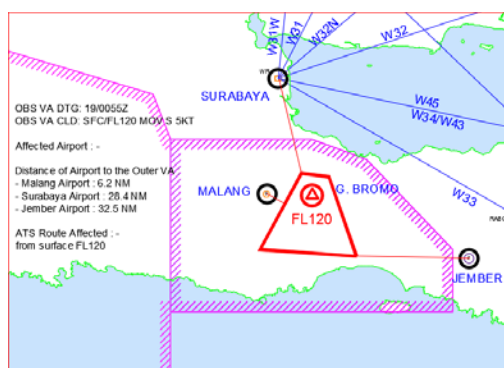
2.2 The following is an example of Modelled Ash Concentration charts of Mt. Sinabung by Himawari Satellite imagery:



2.3 In case of disruption in the operation of volcanic ash advisory centre (VAAC) , then its function can be performed by local meteorological watch office (MWO) authority over the affected territory.

2.4 The air navigation provider has created a forecasts map of airspace which is affected by volcanic ash based on initial information from VAAC Darwin and the local met station/MWO and provide alternate contingency ATS route which is published via NOTAM.

2.5 The following is example of a forecast map of airspace that is affected by Volcanic Ash :



2.6 The first volcanic ash exercise was held in Denpasar, Bali under the cooperation and coordination (umbrella) of the International Civil Aviation Organization (ICAO) that involved the air navigation services provider (ANSP) from Malaysia, Philippines and Australia and it was conducted from 15 -18 February 2016.

2.7 Volcanic activity that affects civil aviation at approximately 30 airports lies within 100 km of volcanoes located in Indonesia. Some notable volcano eruptions in Indonesia that impacted aviation safety are listed below:

	Volcano name	FIR Affected	Number of issued ASHTAM
1	Raung	WAAF	197
2	Dukono	WAAF	1138
3	Tengger caldera	WAAF	368
4	Soputan	WAAF	39
5	Batu tara	WAAF	43
6	Rinjani	WAAF	189
7	lokou	WAAF	3
8	Sangeang Api	WAAF	3
9	Gamalama	WAAF	24
10	Semeru	WAAF	13
11	Sirung	WAAF	4
12	Api Siau	WAAF	38
13	Sinabung	WIIF	296
14	Kerinci	WIIF	33

2.8 NOTAMs related to volcanic activity, are listed below :

a) NOTAM of Aerodrome closed : 214 NOTAMs

List of the Aerodrome :

- Bali
- Lombok
- Ternate
- Sumenep
- Lasikin
- Tapak Tuan
- Surabaya
- Banyuwangi
- Kuabang
- Galela
- Kutacane
- Selaparang

b) NOTAM of establishment temporary danger area : 9 NOTAMs

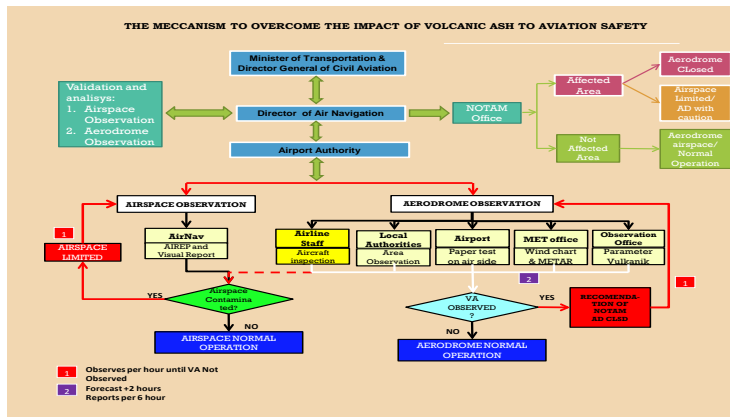
Establishment of temporary danger area as impact Sinabung volcano and Gamalama volcano.

c) NOTAM of closure portion of route and contingency route : 53 NOTAMs

List of affected route :

- W32
- W31
- W34
- W44
- W32N
- W33
- W41
- W45

2.9 The mechanism of overcome the impact of volcanic ash are listed below.



- a. In Exercise Ash Volcanic activity, notification to the volcanic activity through ASHTAM published by the Jakarta International NOTAM Office (NOF) as the provisions in Annex 15 - Aeronautical Information Service (AIS) and ICAO Document 8126 - Manual AIS and which has been adopted in the Civil Aviation Safety Regulations (CASR) Part 175 of the Aeronautical Information Services, not through NOTAM as on the implementation of the Volcanic Ash Exercise which held in the Philippines (VOLPHIN 15/01);
- b. The information regarding movement of volcanic ash delivered by the the Minister of Transportation, through the Director of Air Navigation then delivered to the NOTAM Office for the publication of the affected areas and not affected area by Volcanic Ash.
- c. Information submitted by NOTAM Office will affect the decision of Aerodrome Closed, Airspace Limited/Aerodrome with Caution or Aerodrome / Airspace operating normally.
- d. Directorate of Air Navigation convey to the Airport Authority to conduct observation airspace and aerodrome observation.
- e. The information concerning the aerodrome observation and airspace observation serve as a basic data by Directorate of Air Navigation to validate and analyse a decision on opening or closing of aerodrome then submit the final results to the Minister of Transportation.