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(MET/ATM) SEMINAR**

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Agenda Item 2: Impact of MET on Air Traffic Flow Management (ATFM)

**UTILIZATION OF VOLCANIC ASH ADVISORIES FOR SAFE AIR TRAFFIC
MANAGEMENT**

(Presented by Japan)

SUMMARY

This paper presents the outline of various advisories provided by the Volcanic Ash Advisory Centre Tokyo (VAAC Tokyo) and their utilization for air traffic management, sharing the real experience at the event of Mt. Ontake eruption in 2014 during which rerouting as well as airspace capacity reduction was conducted. This paper additionally introduces a Volcanic Ash Exercise in the Asia/Pacific Region as an example of one of the recent ongoing efforts on air traffic management against volcanic ash.

1. Introduction

1.1 Volcanic ash contains fine particles of glass and pulverized rock that can seriously affect air services by causing engine failure, poor visibility due to ash scratching windshields, as well as take-off/landing delays due to ash accumulation at airports.

1.2 In order to avoid aviation disasters caused by volcanic ash, nine Volcanic Ash Advisory Centres (VAACs) are tasked with monitoring volcanic eruptions and providing information on the extent and movement of volcanic ash clouds as well as outlooks for their regions of responsibility.

1.3 VAAC Tokyo is one of the nine centres and has been in charge of the East Asia and the Northwest Pacific region since March 1997. It provides Volcanic Ash Advisories in text format (VAAs) as well as in graphical format (VAGs), and following the advisories, Meteorological Watch Offices (WMOs) issue SIGMETs and Aeronautical Information Service Centres (AISCs) disseminate NOTAMs.

1.4 In addition to VAA/VAGs, VAAC Tokyo also provides following original advisories for users convenience:

- Volcanic Ash Graphic for Initial Distribution (VAGI) information on the latest extent of volcanic ash to help clarify its current impact on air routes;
- Volcanic Ash Graphic Forecast for Narrow Area (VAGFN) information on hourly volcanic ash trajectory forecast distributions for domestic volcanoes up to six hours ahead by height to assess the future impact of ash on domestic air routes in detail;
- Volcanic Ash Graphic Forecast for Narrow Area of Hypothetical Routine Eruption (VAGFNR) information on hourly volcanic ash trajectory hypothetical forecast distributions for domestic volcanoes thought to be at high risk of eruption, with the assumption of a continuous eruption up to six hours ahead by height, to assess the future impact of ash on domestic air routes in the event of an eruption; and
- Volcanic Ash Graphic Forecast for Narrow Area of Hypothetical Routine Eruption and Ash Fall (VAGFNR-AF) information on hourly volcanic ash trajectory and ash fall hypothetical forecast distributions for domestic volcanoes thought to be at high risk of eruption, with the assumption of a continuous eruption up to three hours ahead by height, to assess the future impact of ash on domestic air routes as well as at domestic airports in the event of an eruption.

2. Recent experience and necessary efforts

2.1 On 27 September 2014, Mt. Ontake in the middle of Japan erupted. The initial ash plume height was reported to be FL370. The ash was estimated to move eastward extending over Haneda and Narita International Airports due to a west wind.

2.2 Based on the estimation provided in the advisories from VAAC Tokyo, many flights especially those heading to Haneda and Narita International Airports from Hokkaido and/or Tohoku District in Japan took a detour and approached the airports from south via Nagoya or Komatsu. In addition, two flights from Australia diverted to Kansai International Airport instead of Narita International Airport.

2.3 As the number of flights heading to Haneda and Narita International Airports from south increased and the traffic became heavier, air traffic flow management initiatives were conducted in order to cope with the situation and the airspace capacity was reduced as well. After the sunset, more flights began to take a big detour because the ash was not visible, while flights during the day mainly requested for a radar control for avoiding ash.

2.4 During the event, information providing organizations such as VAAC Tokyo and the Japan Civil Aviation Bureau (JCAB) received inquiries from airlines as for the expected ash extent, present airport condition, restriction on air traffic control and rerouting. Also, special consideration was made around the volcano at that time in NOTAM to call airlines' attention to rescue helicopters deployed there.

2.5 In this way, once a volcano erupts, its impact onto the air traffic is significant. Information providers issue advisories quickly and users such as airlines will take an immediate action to avoid volcanic ash based on the advisories. To enable the whole procedures without delay, all the relevant organizations need to be ready for the case.

2.6 In order to build a proper scheme against volcanic ash and complete necessary procedures smoothly among related organizations, Volcanic Ash Exercises are taken in some regions under the framework of ICAO. In the exercise, an eruption is assumed and participants test the existing scheme or new challenges aiming at better communication and coordination based on the scenario.

2.7 Around Japan, an exercise called VOLKAM has been taken in Kamchatka region since 2013 and making remarkable progress in both national and international coordination procedures. Additionally, another exercise in the Asia/Pacific region has been newly established and the first planning meeting was held late in May in Manila, Philippines. The first exercise is planned to be conducted this year.

3. Conclusions

3.1 For aviation safety, it is essential to avoid volcanic ash. As a prompt response is required once a volcano erupts, relevant organizations are supposed to be ready in obtaining/using information, re-routing and conducting smooth communication and coordination both nationally and internationally. In this regard, all participants to this seminar are invited to reconfirm various existing advisories related to volcanic ash and examine how to use them.

3.2 The newly established Volcanic Ash Exercise in the Asia/Pacific region is highly meaningful and closer coordination is expected to be achieved through the exercise.
