

Twentieth Meeting of the Cross Polar Trans East Air Traffic Management Providers' Work Group (CPWG/20)

(Anchorage, Alaska 26-29 October 2015)

Agenda Item 5: Update on Action Items

Volcanic Ash and PACOTS Generation Procedures

Presented by Federal Aviation Administration

SUMMARY

This paper provides discusses procedures for PACOTS Track Generation when volcanic activity is present

1 Introduction

1.1 The FAA and JCAB have discussed Volcanic Ash and PACOTS generation at the IPACG Plenary and Providers Meetings. Both JCAB and FAA have encountered situations where Volcanic Ash had created a need for action with the PACOTS Track Generation. Oakland Center's goal was to develop procedures that would be used with Volcanic Ash events that affected PACOTS generation. Both JCAB and FAA realized it was important to gain the Operators and IATAs input before the procedures were completed.

1.2 ICAO Provides the following Guidance on Volcanic Ash:

ICAO Doc 9974 Chapter 2 states:

THE AIRCRAFT OPERATOR

2.3 *ICAO's generic safety risk assessment process is described in the Safety be equally appropriate. The material in this document is designed to provide States with information to support operators in developing the safety risk assessment, within their SMS, covering the volcanic cloud hazard.*

2.4 ***Responsibilities***

- a) *The operator is responsible for the safety of its operations.*
- b) *In order to decide whether or not to operate into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash, the operator should have in place an identifiable safety risk assessment within its SMS.*

Note.— Guidance on the production of a safety risk assessment is provided in Appendices 1 (Guidelines for completing a safety risk assessment), 2 (Procedures to be considered when conducting a safety risk assessment) and 3 (Hazards and risks to be considered by aircraft operators). Each operator should develop its own list of procedures and hazards

since these have to be relevant to the specific equipment, experience and knowledge of the operator, and to the routes to be flown.

THE CIVIL AVIATION AUTHORITY

1.3 ICAO's safety risk assessment process is described in the Safety Management Manual (SMM) (Doc 9859). An approach, aligned with an organization's SMS, would be equally appropriate.

2.10 The State is advised that the CAA exercising oversight of an operator that intends to undertake operations into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash should establish a methodology for evaluating the safety risk assessment process of the operator's SMS particular to volcanic ash. The operator should not be prevented from operating through, under or over, airspace forecast to be affected by a VAA, VAG or SIGMET provided it has demonstrated in its SMS the capability to do so safely. The guidance set out in Appendix 6 indicates a process that the CAA can use to achieve this outcome.

1.4 The Air Traffic Controller responsibilities in the event of an ash cloud are covered in ICAO Doc 4444 paragraph 15.8:

15.8 PROCEDURES FOR AN ATC UNIT WHEN A VOLCANIC ASH CLOUD IS REPORTED OR FORECAST

15.8.1 If a volcanic ash cloud is reported or forecast in the FIR for which the ACC is responsible, the controller should:

- a) relay all information available immediately to pilots whose aircraft could be affected to ensure that they are aware of the ash cloud's position and the flight levels affected;
- b) suggest appropriate re-routing to the flight crew to avoid an area of known or forecast ash clouds;
- c) inform pilots that volcanic ash clouds are not detected by relevant ATS surveillance systems;
- d) if the ACC has been advised by an aircraft that it has entered a volcanic ash cloud the controller should:
 - 1) consider the aircraft to be in an emergency situation;
 - 2) not initiate any climb clearances to turbine-powered aircraft until the aircraft has exited the ash cloud; and
 - 3) not initiate vectoring without pilot concurrence.

Note. — Experience has shown that the recommended escape manoeuvre for an aircraft which has encountered an ash cloud is to reverse its course and begin a descent if terrain permits. The final responsibility for this decision, however, rests with the pilot.

1.5 Following the ICAO Guidance, it is clear that the operator is responsible for the safety of their operations. As long as the operator has completed a safety risk assessment within their SMS, it is their decision to operate in airspace forecast to possibly be contaminated with volcanic ash. When the PACOTS are generated around forecast ash plume, this typically

drives the PACOTS Tracks further south than the optimum placement of the tracks. This creates inefficiency in the PACOTS Tracks and causes extra fuel burn but maintains a safe location for the PACOTS Track. If an operator has completed their safety risk assessment, and determined that it is safe for them to fly a UPR north of the ash plume influenced PACOTS, the IPACG ANSPs could allow it.

1.6 Collaborative Decision Making (CDM) has been used with good success during the VOLKAM exercises and real VA events. CDM is critical to making the best decision on how to handle a VA situation. If time permits, a CDM telecom should be arranged to discuss the Volcanic Ash Event. When possible allow at least 1 hour lead time to allow the proper personnel to participate on the telecom. Of course there may be events that timing does not allow for CDM, but CDM should be used where ever possible.

1.7 At the IPACG meeting it has been agreed to create a Critical Events Contact List (CECL). The CECL email list would be used to notify operators of an CDM telecom to discuss Critical Events such as a Volcanic Ash Event.

2 Discussion

2.1. Oakland ARTCC has developed a draft procedure for their Traffic Management Unit to use in the event of a volcanic ash plume. The draft procedure is included in Attachment 1 of this paper. This PACOTS VA draft guidance was discussed the IPACG41 meeting. IATA took an action Item to discuss the PACOTS Volcanic Ash guidance at their RCG meeting in November and provide feedback on the proposed document.

3 Recommendation

3.1 The meeting should discuss volcanic ash events and aircraft operations when these events occur, and:

3.2 Provide your contact information to Dennis Addison if you wish to have your name added to the CECL list, and:

3.3 Provide comments on the Oakland ARTCC TMU draft guidance for PACOTS generation with volcanic ash.

Oakland Air Route Traffic Control Center
Fremont, California**SUBJ:** OAKLAND ARTC CENTER VOLCANIC ASH AND TRAFFIC MANAGEMENT UNIT
PACOTS TRACK GENERATION PROCEDURES

1. **PURPOSE.** This order establishes procedures for Volcanic Ash Information dissemination, handling airborne aircraft and generating the PACOTS Tracks when Volcanic Ash is present.
2. **DISTRIBUTION.** This order is distributed to Flight Data, Traffic Management and Oceanic personnel at Oakland Center as well as selected offices in the Western-Pacific Regional Office.
4. **BACKGROUND.** Volcanic Ash (VA) has caused engine failure on airborne aircraft and poses a serious risk to aircraft. This Order establishes procedures to be used when Volcanic Activity affects or will have an impact on Oakland ARTCC.
6. **PROCEDURES.**
 - a. When Flight Data receives Volcanic Ash Advisories (VAA) or other volcanic information, it shall immediately be distributed to the Operational Manager In Charge (OMIC).
 - b. The OMIC, as a top priority, shall determine the affected airspace and distribute the information to TMU and the affected Areas.
 - c. Volcanic Activity Contact and Information Websites are listed in Appendix 2.
 - d. If Volcanic Ash is present that indicates the current PACOTS Tracks may be affected, TMU must take the following actions:
 - (1) Plot the current affected area to determine the affected area and altitudes. Consider how the forecasted ash cloud drift (6, 12 and 18 hour forecasts) will affect traffic.
 - (2) Volcanic Ash plumes at F240 and below are not a factor for PACOTS Tracks.
 - (3) Issue a NOTAM advising of the potential risk if a PACOTS track is affected by Volcanic Ash (VA). A sample NOTAM is included in Attachment 1.
 - (4) Determine if published PACOTS tracks are affected by the VA.
 - (a) If the published PACOTS are affected consult with the Oceanic FLM.
 - (b) If aircraft for the affected PACOTS are airborne it will be necessary for the controller to issue advisories of the Ash Plume to the aircraft. This will likely cause aircraft to request re-routes away from the VA.
 - (c) If time permits, have the ATCSCC schedule a teleconference with the International Operators, Japan ATMC and Anchorage ARTCC. The telecon would ideally be at least 1 hour from the current time to allow the operators to get the correct personnel on the telecon, however timing may not permit advance notification to the operators.
 - (d) When conducting a Volcanic Ash Telecom send a High Priority email to the Oceanic Critical Event Contact List advising of the telecom details.
 - (e) On the telecom discuss the VA plume and options for managing the traffic. Get operator feedback and develop a plan.

Note: ICAO Documents require Operators to have an SMS process in place to determine if it is safe to fly through airspace contaminated by VA.

- (i) How will airborne aircraft be managed?
 - (ii) Do the published PACOTS need to be republished in a different location.
 - (iii) Instead of moving PACOTS Tracks an alternative is to publish an additional avoidance Track(s) and issue a NOTAM that states that certain Tracks may be affected by VA. A sample NOTAM is included in Appendix 1.
- (5) Determine if future PACOTS tracks will be affected by the VA.
- (a) Volcanic Ash plumes at F240 and below are not a factor for PACOTS Tracks.
 - (b) Determine the PACOTS Track effective times and ensure the VAA ash plume forecast covers all of the effective times of the PACOTS Track. If necessary, delay PACOTS generation until the VAA forecast covers the entire effective times of the PACOTS Tracks being generated.
 - (c) Plot the VAA to determine the affected area and altitudes.
 - (d) Determine if PACOTS to be generated are affected by the VA.
 - (f) If the PACOTS will be affected by the VA:
 - a. consult with the Oceanic FLM, and:
 - b. TMU will coordinate with the ATCSCC to schedule a telecom with the International Operators, Japan ATMC, the (VAC) and Anchorage ARTCC. The telecom would ideally be at least 1 hour from the current time to allow the operators to get the correct personnel on the telecom.
 - c. When conducting a Volcanic Ash Telecom TMU will send a High Priority email to the Oceanic Critical Event Contact List advising of the telecom details.
 - (g) On the telecom discuss the VA plume and options for managing the traffic. If the determination is made that the PACOTS Tracks will be affected, suggest on the telecom that Oakland will generate the PACOTS Tracks 25 nm clear of the VAA forecast. Get operator feedback on the proposed plan and attempt to develop a consensus plan.

Note: ICAO Documents require Operators to have an SMS process in place to determine if it is safe to fly through airspace contaminated by VA.

Appendix 1

ATTN AIRCRAFT OPERATORS AND FLIGHT DISPATCHERS. DUE TO SHEVELUCH VOLCANIC ACTIVITY AIRCRAFT TRANSITING BETWEEN NORTH AMERICA AND JAPAN/ASIA SHOULD USE SMS PROCESS TO DETERMINE WHETHER TO USE PUBLISHED PACOTS TRACKS C, E, F OR M FOR PACIFIC OCEAN CROSSING. AN ALTERNATE TRACK G HAS BEEN PUBLISHED WHICH AVOIDS CURRENT FORECAST FOR ASH CLOUD MOVEMENT. OPERATORS MAY ALSO ELECT TO FLY A USER PREFERRED ROUTE IN PLACE OF A PACOTS TRACK. QUESTIONS REGARDING FLIGHT PLANNED ROUTES CAN BE DIRECTED TO THE OAKLAND OCEANIC SUPERVISOR AT (510) 745-3342

VOLCANIC POINTS OF CONTACT AND WEB ADDRESSES

AVO PHONE NUMBERS:

24 Hour Access: 907-786-7497

AVO Duty Scientist: 907-632-2275

AVO Scientist-In-Charge 907-786-7488

VOLCANO INFORMATION WEBSITES:

SIGMET/AIRMET Information: <http://aawu.arh.noaa.gov/>

NOTAM Information: <https://www.notams.faa.gov/>

PIREP Information: <http://aawu.arh.noaa.gov/index.php?tab=4&hour=3>

Anchorage VAAC: <http://vaac.arh.noaa.gov/>

Alaska Volcano Observatory: <http://www.avo.alaska.edu/>

Ash Fall and Marine Advisories: <http://cwsu.arh.noaa.gov/>

HYSPLIT Trajectories: http://ready.arl.noaa.gov/READY_traj_alaska.php
(Alaska Volcanoes)

Temporary Flight Restrictions: <http://tfr.faa.gov/tfr2/list.jsp>

PUFF Model: <http://avo-volcview.wr.usgs.gov/puff/main.pl>

KVERT (Current Volcanic Activity): http://www.kscnet.ru/ivs/kvert/index_eng.php

NOAA Satellite & Information Service: <http://www.ssd.noaa.gov/VAAC/kamchatka.html>
(Split Window Loops/Kamchatka)

NOAA Satellite & Information Service: <http://www.ssd.noaa.gov/VAAC/ALEUT/SPLIT/splitloop.html>
(Split Window Loops/Aleutians)

NOAA Satellite & Information Service: <http://www.ssd.noaa.gov/VAAC/aleut.html>
(Aleutian Islands Volcano Watch)

NOAA Satellite & Information Service: <http://www.ssd.noaa.gov/VAAC/kamchatka.html>
(Kamchatka Volcano Watch)

Volcanic Ash Transport & Dispersion: <http://www.arl.noaa.gov/ready/ash.html>
(VAFTAD)

Tokyo VAAC: <http://ds.data.jma.go.jp/svd/vaac/data/index.html>

Washington VAAC: <http://www.ssd.noaa.gov/VAAC/washington.html>