

## EXERCISE DIRECTIVE FOR VOLCANIC ASH EXERCISE IN KAMCHATKA IN 2019 (VOLKAM19) – updated 18 April 2019

### 1. INTRODUCTION

A simulated eruption of **Opala** volcano in Kamchatka will produce volcanic ash with one plume with height to **FL450 moving SE at 400 km/hr** that will impact trans-east, Northern Pacific (NOPAC) and Pacific Organized Track System (PACOTS) routes. The plume will also move under the area of VAAC responsibility **Tokyo**, then **Anchorage**, and then **Washington** to test handover of each pair. In addition, another eruption of **Ushkovsky** volcano in Kamchatka will produce volcanic ash with one plume with height to **FL250 moving NW at 400 km/hr** to impact trans-east routes. VOLKAM19 will take place from **2200 UTC 18 April 2019 to 0200 UTC 19 April 2019**. The objectives to be tested are provided in section 3 of this report. The Exercise Leader will be Alexey Buevich of ATM Center Moscow. *There will be no operational impact in this exercise (dedicated staff is expected to be available for the test)*. The EUR/NAT Volcanic Ash Contingency Plan should be tested in this exercise, where applicable.

*Note that if one or more participants consider it difficult to continue this exercise due to severe events such as an actual volcanic eruption or significant meteorological event, they may advise the Exercise Leader to cancel the exercise. In response, the Exercise Leader will announce the cancellation where appropriate.*

### 2. PARTICIPATING AGENCIES

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### 3. AIMS AND OBJECTIVES

- demonstrate coordination procedures between all participating parties (ANSPs, ATM Centres, AIS, VO, VAACs, MWO, users);
- demonstrate coordination between Magadan and Fukuoka ACCs using contingency Memorandum of Understanding;
- demonstrate tactical re-routes using available methods including DARP-like test using CPDLC (re-routes to use existing route structure);
  - DARP-like test between Magadan and Anchorage ACCs via AIDC;
  - DARP-like test between Magadan and Khabarovsk ACCs via OLDI;
- demonstrate diversion to Magadan to test emergency procedures;
- demonstrate VAAC Tokyo / VAAC Anchorage / VAAC Washington handover;
- demonstrate transmission of air-reports on volcanic ash in accordance to Annex 3 (aircraft->ACC->MWO->VAAC) using CPDLC, VHF and HF; and
- demonstrate information sharing via teleconferences and website (KVERT website with PUFF and aeronautical information).

*Noting no operational impact expected from test (e.g. dedicated staff is expected to be available for the test)*

### 4. EXERCISE DURATION

2200 UTC 18 Apr 2019 / 0200 UTC 19 Apr 2019

### 5. EXERCISE VOLCANO

**Opala** (300080) N52 33 E157 20 2475m Russian Federation – Kamchatka

**Ushkovsky** (300261) N56 04 E160 28 3943m Russian Federation - Kamchatka

### 6. EXERCISE SCENARIO

Eruption of **Opala** with ash column to **FL450** moving southeast at 400 km/hr to impact trans-east, NOPAC and PACOTS routes. Eruption of **Ushkovsky** with ash column to **FL250** moving northwest at 400 km/hr to impact trans-east routes.

## 7. EXERCISE SCHEDULE

<i>Time (UTC)</i>	<i>Player</i>	<i>Event/Action</i>
<b>11 Mar 2019</b>	Exercise Leader (coordinating with ICAO EUR NAT VOLCEX Secretary)	Final directives to be published on the ICAO EUR/NAT office Volcanic Ash webpage ( <a href="http://www.paris.icao.int/Volc_Ash/index.htm">http://www.paris.icao.int/Volc_Ash/index.htm</a> )
<b>11 Apr 2019</b>	MATMC (Russia)and US ATCSCC	Issue a general NOTAM via their national NOFs to inform the aviation community of the exercise
<b>11 Apr 2019</b>	NOFs	Issue consequential NOTAMs to inform the aviation community of the exercise
<b>11 Apr 2019 at 21:30</b>	All	Practice telecon
<b>11 Apr 2019</b>	All	Email list for VOLKAM19 completed
<b>18 Apr 2019 (UTC TIME)</b>	EXERCISE VOLKAM19	
<b>21:15</b>	All	Practice telecon (5 minutes) (invitation 2045)
<b>21:40</b>	MATMC + Exercise Leader	Start VOLKAM19 through an email message to all exercise players
<b>21:45</b>	<b>Opala</b> (Kamchatka)	<b>EXPLOSIVE ERUPTION STARTS</b>
<b>22:00</b>	Volcano Observatory (KVERT, Institute of Volcanology & Seismology, Far East Branch, Russian Academy of Sciences)	Phone call to Yelizovo MWO providing information available related to the eruption (this call would enable the MWO to begin the process of generating and disseminating SIGMET)  VONA is issued (indicating change in aviation colour code and giving first known data about eruption) and sent via email to MATMC, Petropavlovsk-Kamchatsky ACC, Yelizovo MWO, VAAC Tokyo, VAAC Anchorage, VAAC Washington, VAAC Montréal, VAAC Darwin, AVO and others, and post to KVERT web-site: <a href="http://www.kscnet.ru/ivs/kvert/van/">http://www.kscnet.ru/ivs/kvert/van/</a>  <i>Reference VONA example for 2200 in section 8</i>
<b>Sequentially – preferably no more than 5 min after receipt of VONA</b>	Yelizovo MWO	Issues first SIGMET to provide notification of an eruption ( <b>Opala</b> ) to VAAC Tokyo, MATMC, PK ACC and other players concerned such as other weather providers

<b>Time (UTC)</b>	<b>Player</b>	<b>Event/Action</b>
<b>22:05</b>	VAAC Tokyo	Issues first VAA without observed/forecasted VA ( <b>Opala</b> ). This information is about the eruption only; provides VAA to MATMC and other key players concerned. Follow guidance in Annex 3 on message format.
<b>Sequentially</b>	MATMC	MATMC requests Moscow NOF to issue NOTAM
<b>Sequentially</b>	Moscow NOF	Issues NOTAM in accordance to Annex 15 and indicates colour code RED ( <b>Opala</b> )  <i>Reference example NOTAM for 2205 UTC in section 8</i>
<b>22:15</b>	<b>Ushkovsky</b> (Kamchatka)	<b>EXPLOSIVE ERUPTION STARTS</b>
<b>22:30</b>	Volcano Observatory (KVERT, Institute of Volcanology & Seismology, Far East Branch, Russian Academy of Sciences)	Phone call to Yelizovo MWO providing information available related to the eruption (this call would enable the MWO to begin the process of generating and disseminating SIGMET)  VONA is issued (indicating change in aviation colour code and giving first known data about eruption) and sent via email to MATMC, Petropavlovsk-Kamchatsky ACC, Yelizovo MWO, VAAC Tokyo, VAAC Anchorage, VAAC Washington, VAAC Montréal, VAAC Darwin, AVO and others, and post to KVERT web-site: <a href="http://www.kscnet.ru/ivs/kvert/van/">http://www.kscnet.ru/ivs/kvert/van/</a>  <i>Reference VONA examples for 2230 in section 8</i>
<b>Sequentially</b>	MWO Yelizovo	SIGMET for second ash cloud issued ( <b>Ushkovsky</b> )
<b>22:35</b>	VAAC Tokyo	VAA issued for second ash cloud ( <b>Ushkovsky</b> )
<b>Sequentially</b>	MATMC	MATMC requests Moscow NOF to issue NOTAM
<b>Sequentially</b>	Moscow NOF	Issues NOTAM in accordance to Annex 15 indicates colour code RED for the second volcano ( <b>Ushkovsky</b> )  <i>Reference example NOTAM for 2235 UTC in section 8</i>
<b>22:40</b>	VAAC Tokyo	Issues second VAA/first VAG ( <b>Opala</b> ); provides VAA/VAG to MATMC and other key players concerned.  Coordinate between Tokyo and Anchorage VAACs.  Follow guidance in Annex 3 on message format.
<b>Sequentially</b>	MWOs affected (make	Issue SIGMETs for respective areas ( <b>Opala</b> )

<i>Time (UTC)</i>	<i>Player</i>	<i>Event/Action</i>
	more clear after scenario is known)	
<b>Sequentially</b>	MATMC	MATMC requests Moscow NOF to issue NOTAM
<b>Sequentially</b>	Moscow NOF	Issues NOTAM in accordance to Annex 15 and indicates colour code RED for first ash cloud ( <b>Opala</b> ) and references existing information (e.g. VAA/VAG and SIGMET)  <i>Reference example NOTAM for 2240 UTC in section 8</i>
<b>Sequentially</b>	AO (coordination between dispatch and flight crews)	Take appropriate flight planning actions: e.g. reroute or cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.  Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).  For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.  <i>Reference ATOP area in Anchorage airspace in section 8</i>
<b>23:00</b>	VO	Eruption stops for <b>Opala</b> – VONA with colour change from RED to ORANGE issued  <i>Reference example VONA for 2300 in section 8</i>
<b>Sequentially</b>	MATMC	MATMC requests Moscow NOF to issue NOTAM
<b>Sequentially</b>	NOF Moscow	Issues NOTAM in accordance to Annex 15 and indicates colour code ORANGE for first volcano ( <b>Opala</b> ) and references existing information (e.g. VAA/VAG and SIGMET)  <i>Reference example NOTAM for 2300 in section 8</i>
<b>Sequentially</b>	MATMC	Issues an invitation to teleconference via email (time of teleconference at 2340)
<b>23:00 - 23:15 (approximately –</b>	AO, ACC, MWO, VAAC	Special aircraft report of volcanic ash at lat/lon <b>N50 00 E156 00</b> (to be determined based on ash scenario).



<i>Time (UTC)</i>	<i>Player</i>	<i>Event/Action</i>
as soon as practically possible – depends on aircraft in area of ash cloud – if no traffic in the area, airline will simulate report and send to ACC)	UAL will send AIREPs via aircraft to the extent possible given the locations of aircraft on the actual day of the exercise	Communications of special air-report = aircraft → ACC – > MWO → VAAC Tokyo (also MWO to ROC Vienna, SADIS and WIFS – see example in section 8)  Mode of sending AIREP is via CPDLC  See example on special air-report on volcanic ash.
23:10	VAAC Tokyo	Issues VAA/VAG for second ash cloud ( <i>Ushkovsky</i> )
Sequentially	MWOs affected	Issue SIGMETs for respective areas ( <i>Ushkovsky</i> )
Sequentially	MATMC	MATMC requests Moscow NOF to issue NOTAM
Sequentially	Moscow NOF	Issues NOTAM in accordance to Annex 15 and indicates colour code RED for second ash cloud ( <i>Ushkovsky</i> ) and references existing information (e.g. VAA/VAG and SIGMET)  <i>Reference example NOTAM for 2310 UTC in section 8</i>
Sequentially	AO (coordination between dispatch and flight crews)	Take appropriate flight planning actions: e.g. reroute or cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.  Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).  For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.  <i>Reference ATOP area in Anchorage airspace in section 8</i>
23:30	VAAC Tokyo	Issues VAA/VAG for first ash cloud ( <i>Opala</i> ) and references future handover to VAAC Anchorage
23:30	VO	Eruption stops for <i>Ushkovsky</i> – VONA with colour change from RED to ORANGE issued  <i>Reference example VONA for 2330 in section 8</i>

<i>Time (UTC)</i>	<i>Player</i>	<i>Event/Action</i>
<b>Sequentially</b>	MATMC	MATMC requests Moscow NOF to issue NOTAM
<b>Sequentially</b>	NOF Moscow	Issues NOTAM in accordance to Annex 15 and indicates colour code ORANGE for second volcano ( <b>Ushkovsky</b> ) and references existing information (e.g. VAA/VAG and SIGMET)  <i>Reference example NOTAM for 2330 UTC in section 8</i>
<b>Sequentially</b>	MWOs affected (make more clear after scenario is known)	Issue SIGMETs for respective areas ( <b>Opala</b> )
<b>Sequentially</b>	AO (coordination between dispatch and flight crews)	Take appropriate flight planning actions: e.g. reroute or cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.  Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).  For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.  AA to exercise emergency diversion to Magadan  <i>Reference diversion example in section 8</i> <i>Reference ATOP area in Anchorage airspace in section 8</i>
<b>23:40</b>	All	Operational teleconference to discuss the latest situation; (details of teleconference to be provided)  Sharing information in advance via email is suggested
<b>00:00</b>	VAAC Anchorage	Issues VAA/VAG for first ash cloud ( <b>Opala</b> )  Follow guidance in Annex 3 on message format.
<b>00:00</b>	VAAC Tokyo	Issues VAA/VAG for second ash cloud ( <b>Ushkovsky</b> )
<b>Sequentially</b>	MWOs affected	Issue updated SIGMETs for respective areas ( <b>Opala</b> and <b>Ushkovsky</b> )
<b>Sequentially</b>	AO	Take appropriate flight planning actions: e.g. reroute or

<b>Time (UTC)</b>	<b>Player</b>	<b>Event/Action</b>
	(coordination between dispatch and flight crews)	<p>cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.</p> <p>Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).</p> <p>For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.</p> <p><i>Reference ATOP area in Anchorage airspace in section 8</i></p>
<b>00:15</b>	MATMC	Issues an invitation to teleconference via email (time of teleconference at 0115)
<b>01:00</b>	VAAC Anchorage	Issues VAA/VAG for first ash cloud ( <b>Opala</b> ) and references future handover to VAAC Washington
<b>Sequentially</b>	MWOs affected (make more clear after scenario is known)	Issue SIGMETs for respective areas ( <b>Opala</b> )
<b>Sequentially</b>	AO (coordination between dispatch and flight crews)	<p>Take appropriate flight planning actions: e.g. reroute or cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.</p> <p>Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).</p> <p>For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.</p> <p><i>Reference ATOP area in Anchorage airspace in section 8</i></p>
<b>01:15</b>	All	Operational teleconference to discuss the latest situation; (details of teleconference to be provided)
<b>01:30</b>	VAAC Washington	Issues VAA/VAG for first ash cloud ( <b>Opala</b> )
<b>Sequentially</b>	MWOs affected (make	Issue SIGMETs for respective areas ( <b>Opala</b> )

<i>Time (UTC)</i>	<i>Player</i>	<i>Event/Action</i>
	more clear after scenario is known)	
<b>Sequentially</b>	AO (coordination between dispatch and flight crews)	<p>Take appropriate flight planning actions: e.g. reroute or cancel flights. All requests will be sent to the following email address <a href="mailto:volkam@matfmc.ru">volkam@matfmc.ru</a> (using subject header such as reroutes for clarity; if reroutes – add FIR impacted) and forwarded to the respective centres.</p> <p>Reroute requests should be in the form of FPL using available methods including DARP-like test using CPDLC and coordination should occur via AIDC between Anchorage/Magadan, and Magadan/Khabarovsk (uses OLDI).</p> <p>For deviating around the volcanic ash cloud, operators may consider reroute information published by NOTAM.</p> <p><i>Reference ATOP area in Anchorage airspace in section 8</i></p>
<b>02:00</b>	MATMC + Exercise Leader	End VOLKAM19 announced by cancelling the initial exercise NOTAM and advisory NOTAMs, SIGMETs and VONAs (for those messages whose end period of validity is after 0200).

## 8. EXERCISE SCENARIO MESSAGES

### VONA

(KVERT update) **First VONA (2200 UTC, 18 April 2019)**

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

#### (1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)

- (2) Issued: 20190418/2200Z
- (3) Volcano: **Opala** (CAVW #300080)
- (4) Current Aviation Color Code: **RED**
- (5) Previous Aviation Color Code: green
- (6) Source: KVERT
- (7) Notice Number: 2019-0000
- (8) Volcano Location: N 52 deg 33 min E 157 deg 20 min
- (9) Area: Kamchatka, Russia
- (10) Summit Elevation: 8118 ft (2475 m)
- (11) Volcanic Activity Summary: Very strong explosive eruption of **Opala** volcano began at 21:45 UTC on April 18, 2019. According to satellite data, ash is reaching 45,000 ft (13.8 km) a.s.l. and ash plume is drifting to the southeast of the volcano on the height 45,000 ft (13.8 km) a.s.l. at this time. Ash emission is continuing.

A strong explosive eruption of the volcano continues. Ongoing activity could affect international and low-flying aircraft.

#### (12) Volcanic cloud height:

45,000 ft (13.8 km) a.s.l. Time and method of ash plume/cloud height determination: 20190418/2145Z – NOAA 18 (4m5)

#### (13) Other volcanic cloud information:

Distance of ash plume/cloud of the volcano: 32 mi (50 km)

Direction of drift of ash plume/cloud of the volcano: SE / azimuth 140 deg Time and method of ash plume/cloud determination: 20190418/2145Z – NOAA 18 (4m5)

(14) Remarks: This strong explosive eruption is extremely hazardous for aircraft downwind. There was one known a strong explosive eruption of **Opala** volcano in 1776. **Opala** volcano is not monitored with a seismic station. KVERT uses satellite data and sometimes visual observations by hikers and pilots reports to monitor this volcano.

(15) Contacts: Dr. Olga A. Girina, Head of KVERT, IVS FEB RAS;  
girina@kscnet.ru +74152202044

Duty scientist: +79622825253

(16) Next Notice: A new VONA will be issued if conditions change significantly or the Aviation Color Code changes. VONAs are posted at <http://www.kscnet.ru/ivs/kvert/van/>

In Russia, KVERT, on behalf of the Institute of Volcanology and Seismology (IVS) FED RAS, is responsible for providing information on volcanic activity to international air navigation services for the airspace users.

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

(KVERT update) **Second VONA (2230 UTC, 18 April 2019)**

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

**(1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)**

- (2) Issued: 20190418/2230Z
- (3) Volcano: [Ushkovsky](#) (CAVW #300261)
- (4) Current Aviation Color Code: **RED**
- (5) Previous Aviation Color Code: green
- (6) Source: KVERT
- (7) Notice Number: 2019-0001
- (8) Volcano Location: N 56 deg 04 min E 160 deg 28 min
- (9) Area: Kamchatka, Russia
- (10) Summit Elevation: 12 933 ft (3943 m)
- (11) Volcanic Activity Summary: A strong explosive eruption of [Ushkovsky](#) volcano began at 22:15 UTC on April 18, 2019. According to satellite data, ash is reaching 25,000 ft (7.6 km) a.s.l. and ash plume is drifting to the northwest of the volcano on the height 25,000 ft (7.6 km) a.s.l. at this time. Ash emission is continuing.

A strong explosive eruption of the volcano continues. Ongoing activity could affect international and low-flying aircraft.

25,000 ft (7.6 km) a.s.l. Time and method of ash plume/cloud height determination: 20190418/2215Z – NOAA 18 (4m5)

(13) Other volcanic cloud information:

Distance of ash plume/cloud of the volcano: 19 mi (30 km)  
Direction of drift of ash plume/cloud of the volcano: NW / azimuth 320 deg  
Time and method of ash plume/cloud determination: 20190418/2215Z – NOAA 18 (4m5)

(14) Remarks: This strong explosive eruption is extremely hazardous for aircraft downwind. There was one known a strong explosive eruption of [Ushkovsky](#) volcano in 1890. [Ushkovsky](#) volcano is monitored with a seismic station. KVERT uses satellite data and visual observations by volcanologist of F.Yu. Levinson-Lessing Kamchatkan Volcanological Station (Klyuchi), and hikers and pilots reports to monitor this volcano.

(15) Contacts: Dr. Olga A. Girina, Head of KVERT, IVS FEB  
RAS; girina@kscnet.ru +74152202044  
Duty scientist: +79622825253

(16) Next Notice: A new VONA will be issued if conditions change

significantly or the Aviation Color Code changes. VONAs are posted at <http://www.kscnet.ru/ivs/kvert/van/>

In Russia, KVERT, on behalf of the Institute of Volcanology and Seismology (IVS) FED RAS, is responsible for providing information on volcanic activity to international air navigation services for the airspace users.

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE



(KVERT update) **ThirdVONA (2300 UTC, 18 April 2019)**

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

**(1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)**

- (2) Issued: 20190418/2300Z
- (3) Volcano: **Opala** (CAVW #300080)
- (4) Current Aviation Color Code: **ORANGE**
- (5) Previous Aviation Color Code: red
- (6) Source: KVERT
- (7) Notice Number: 2019-0002
- (8) Volcano Location: N 52 deg 33 min E 157 deg 20 min
- (9) Area: Kamchatka, Russia
- (10) Summit Elevation: 8118 ft (2475 m)
- (11) Volcanic Activity Summary: The strong explosive eruption of **Opala** volcano has finished. According to satellite data, a thermal anomaly is observed over the volcano but no ash is erupting from the volcano at this time.

A moderate gas-steam activity of the volcano continues. Ongoing activity could affect low-flying aircraft.

(12) Volcanic cloud height: NO ASH CLOUD PRODUCED

(13) Other volcanic cloud information: NO ASH CLOUD PRODUCED

(14) Remarks: According to VAAC Tokyo forecast, at 1040 UTC on April 19, the leading edge of the ash cloud is an estimated 1000 miles south-east of the volcano (FL450), and the leading edge of the ash cloud is an estimated 2100 miles south-east of the volcano (FL170). See the VAAC Tokyo VAA/VAG and SIGMETs for current ash cloud information.

(15) Contacts:  
Dr. Olga A. Girina, Head of KVERT, IVS FEB RAS; girina@kscnet.ru +74152202044  
Duty scientist: +79622825253

(16) Next Notice: A new VONA will be issued if conditions change significantly or the Aviation Color Code changes. VONAs are posted at <http://www.kscnet.ru/ivs/kvert/van/>

In Russia, KVERT, on behalf of the Institute of Volcanology and Seismology (IVS) FED RAS, is responsible for providing information on volcanic activity to international air navigation services for the airspace users.

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

(KVERT update) **Fourth VONA (2330 UTC, 18 April 2019)**  
VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

**(1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)**

- (2) Issued: 20190418/2330Z
- (3) Volcano: [Ushkovsky](#) (CAVW #300261)
- (4) Current Aviation Color Code: **ORANGE**
- (5) Previous Aviation Color Code: red
- (6) Source: KVERT
- (7) Notice Number: 2019-0003
- (8) Volcano Location: N 56 deg 04 min E 160 deg 28 min
- (9) Area: Kamchatka, Russia
- (10) Summit Elevation: 12 933 ft (3943 m)
- (11) Volcanic Activity Summary: The strong explosive eruption of [Ushkovsky](#) volcano has finished. According to satellite data, a thermal anomaly is observed over the volcano but no ash is erupting from the volcano at this time.

A moderate gas-steam activity of the volcano continues. Ongoing activity could affect low-flying aircraft.

(12) Volcanic cloud height: NO ASH CLOUD PRODUCED

(13) Other volcanic cloud information: NO ASH CLOUD PRODUCED

(14) Remarks: According to VAAC Tokyo forecast, at 1040 UTC on April 19, the leading edge of the ash cloud is an estimated 2000 miles north-west of the volcano (FL250). See the VAAC Tokyo VAA/VAG and SIGMETs for current ash cloud information.

(15) Contacts: Dr. Olga A. Girina, Head of KVERT, IVS FEB  
RAS; [girina@kscnet.ru](mailto:girina@kscnet.ru) +74152202044  
Duty scientist: +79622825253

(16) Next Notice: A new VONA will be issued if conditions change significantly or the Aviation Color Code changes. VONAs are posted at <http://www.kscnet.ru/ivs/kvert/van/>

In Russia, KVERT, on behalf of the Institute of Volcanology and Seismology (IVS) FED RAS, is responsible for providing information on volcanic activity to international air navigation services for the airspace users.

VOLKAM19 EXERCISE EXERCISE EXERCISE VOLKAM19 EXERCISE EXERCISE

**VAA (VAA-1: Opala from VAAC Tokyo at 0418/2205 – No associated VAG)**

FVFE01 RJTD 182205  
VA ADVISORY  
DTG: 20190418/2205Z  
VAAC: TOKYO  
VOLCANO: OPALA 300080  
PSN: N5233 E15720  
AREA: RUSSIA  
SUMMIT ELEV: 2439M  
ADVISORY NR: 9999/1  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2145Z FL450  
EXTD SE REPORTED  
OBS VA DTG: 18/2150Z  
OBS VA CLD: VA NOT IDENTIFIABLE FM SATELLITE DATA WIND FL450  
130/220KT  
FCST VA CLD +6 HR: NOT AVBL  
FCST VA CLD +12 HR: NOT AVBL  
FCST VA CLD +18 HR: NOT AVBL  
RMK: VA EXERCISE VOLKAM19  
WE WILL ISSUE FURTHER ADVISORY IF VA IS DETECTED IN SATELLITE  
IMAGERY.  
EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO FURTHER ADVISORIES=

(VAA-2: Ushkovsky from VAAC Tokyo at 0418/2235 – No associated VAG)

FVFE01 RJTD 182235  
VA ADVISORY  
DTG: 20190418/2235Z  
VAAC: TOKYO  
VOLCANO: [USHKOVSKY](#) 300261  
PSN: N5607 E16031  
AREA: RUSSIA  
SUMMIT ELEV: 3943M  
ADVISORY NR: 9999/1  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2215Z FL250  
EXTD NW REPORTED  
OBS VA DTG: 18/2220Z  
OBS VA CLD: VA NOT IDENTIFIABLE FM SATELLITE DATA WIND FL250  
310/220KT  
FCST VA CLD +6 HR: NOT AVBL  
FCST VA CLD +12 HR: NOT AVBL  
FCST VA CLD +18 HR: NOT AVBL  
RMK: VA EXERCISE VOLKAM19  
WE WILL ISSUE FURTHER ADVISORY IF VA IS DETECTED IN SATELLITE  
IMAGERY.  
EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO FURTHER ADVISORIES=

(VAA-3: Opala from VAAC Tokyo at 0418/2240)

FVFE01 RJTD 182240  
VA ADVISORY  
DTG: 20190418/2240Z  
VAAC: TOKYO  
VOLCANO: OPALA 300080  
PSN: N5233 E15720  
AREA: RUSSIA  
SUMMIT ELEV: 2439M  
ADVISORY NR: 9999/2  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2145Z FL450  
EXTD SE REPORTED  
OBS VA DTG: 18/2210Z  
OBS VA CLD: SFC/FL450 N5233 E15720 - N5209 E15800 - N5138  
E15801 - N5125 E15742 - N5147 E15708 MOV SE 220KT  
FCST VA CLD +6 HR: 19/0410Z SFC/FL450 N4456 E17155 - N4442  
E16802 - N4810 E16224 - N5155 E15752 - N4948 E16419  
FCST VA CLD +12 HR: 19/1010Z SFC/FL450 N4323 E17408 - N4218  
E16927 - N4554 E16416 - N5211 E15734 - N5100 E16428 - N4717  
E17130  
FCST VA CLD +18 HR: 19/1610Z SFC/FL450 N4908 E17156 - N4329  
E17942 - N3946 E17443 - N4500 E16553 - N5206 E15708  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0000Z=

**(VAA-4: Ushkovsky from VAAC Tokyo at 0418/2310)**

FVFE01 RJTD 182310  
VA ADVISORY  
DTG: 20190418/2310Z  
VAAC: TOKYO  
VOLCANO: **USHKOVSKY** 300261  
PSN: N5607 E16031  
AREA: RUSSIA  
SUMMIT ELEV: 3943M  
ADVISORY NR: 9999/2  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2215Z FL250  
EXTD NW REPORTED  
OBS VA DTG: 18/2240Z  
OBS VA CLD: SFC/FL250 N5608 E16029 - N5619 E15922 - N5720  
E15914 - N5657 E16039 MOV NW 220KT  
FCST VA CLD +6 HR: 19/0440Z SFC/FL250 N5650 E16020 - N5735  
E14538 - N5947 E13639 - N6231 E14138  
FCST VA CLD +12 HR: 19/1040Z SFC/FL250 N5635 E15943 - N5823  
E12444 - N6120 E10914 - N6712 E12355 - N6138 E13613  
FCST VA CLD +18 HR: 19/1640Z SFC/FL250 N5652 E11531 - N5958  
E09949 - N6919 E11603 - N6055 E13116 - N5637 E16003  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0000Z=

(VAA-5: Opala from VAAC Tokyo at 0418/2330)

FVFE01 RJTD 182330  
VA ADVISORY  
DTG: 20190418/2330Z  
VAAC: TOKYO  
VOLCANO: OPALA 300080  
PSN: N5233 E15720  
AREA: RUSSIA  
SUMMIT ELEV: 2439M  
ADVISORY NR: 9999/3  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE VA CONTINUOUSLY OBS ON SATELLITE  
IMAGERY.  
OBS VA DTG: 18/2300Z  
OBS VA CLD: SFC/FL450 N5232 E15723 - N5106 E16108 - N4934  
E16111 - N5000 E15938 MOV SE 220KT  
FCST VA CLD +6 HR: 19/0500Z SFC/FL450 N4542 E17143 - N4421  
E16949 - N4525 E16559 - N4917 E16323 - N4818 E16802  
FCST VA CLD +12 HR: 19/1100Z SFC/FL450 N4140 E17703 - N4057  
E17249 - N4252 E16908 - N4712 E16908 - N4536 E17241  
FCST VA CLD +18 HR: 19/1700Z SFC/FL450 N4144 E17855 - N3728  
E17802 - N3928 E17414 - N4352 E17100 - N4508 E17314  
RMK: VA EXERCISE VOLKAM19  
THE RESPONSIBILITY FOR THIS ASH EVENT IS BEING TRANSFERRED TO  
VAAC ANCHORAGE. THE NEXT ADVISORY WILL BE ISSUED BY VAAC  
ANCHORAGE BY 0100UTC UNDER HEADER FVAK21 PAWU.  
EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO FURTHER ADVISORIES=

(VAA-6: Ushkovsky from VAAC Tokyo at 0419/0000)

FVFE01 RJTD 190000  
VA ADVISORY  
DTG: 20190419/0000Z  
VAAC: TOKYO  
VOLCANO: USHKOVSKY 300261  
PSN: N5607 E16031  
AREA: RUSSIA  
SUMMIT ELEV: 3943M  
ADVISORY NR: 9999/3  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT  
AVIATION COLOUR CODE: NIL  
ERUPTION DETAILS: VA EXERCISE VA CONTINUOUSLY OBS ON SATELLITE  
IMAGERY  
OBS VA DTG: 18/2330  
OBS VA CLD: SFC/FL250 N5608 E16029 - N5641 E15820 - N5840  
E15754 - N5759 E16015 MOV NW 220KT  
FCST VA CLD +6 HR: 19/0530Z SFC/FL250 N5916 E14415 - N6102  
E13703 - N6356 E14325 - N6027 E14844  
FCST VA CLD +12 HR: 19/1130Z SFC/FL250 N6009 E11928 - N6011  
E10716 - N6734 E11753 - N6419 E12506  
FCST VA CLD +18 HR: 19/1730Z SFC/FL250 N6004 E11341 - N5932  
E09847 - N7026 E11314 - N6411 E12035  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0600Z=



**(VAA-1: Opala from VAAC Anchorage at 0419/0000)**

FVAK21 PAWU 190000  
VAAAK1  
VA ADVISORY  
DTG: 20190419/0000Z  
VAAC: ANCHORAGE  
VOLCANO: OPALA 300080  
PSN: N5233 E15720  
AREA: KAMCHATKA PENINSULA  
SUMMIT ELEV: 8120 FT (2475 M)  
ADVISORY NR: 2019/001  
INFO SOURCE: EXERCISE  
AVIATION COLOR CODE: RED  
ERUPTION DETAILS: THIS IS DRILL PORTION OF VOLKAM19  
OBS VA DTG: 19/0000Z  
OBS VA CLD: FL250/FL450 N5103 E15814 - N5209 E16016 - N5017  
E16321 - N4843 E15951 - N5103 E15814 MOV SE 215KT.  
FCST VA CLD +6HR: 19/0600Z FL250/FL450 N5120 E16143 - N4312  
E17258 - N3957 E16529 - N5025 E15843 - N5120 E16143 - N5120  
E16143.  
FCST VA CLD+12HR: 19/1200Z NO VA EXP.  
FCST VA CLD+18HR: 19/1800Z NO VA EXP.  
RMK: VAAC TOKYO HAS TRANSFERRED RESPONSIBILITY OF THIS EVENT  
TO VAAC ANCHORAGE. THIS ADVISORY UPDATES MESSAGE FVFE01 RJTD.  
NXT ADVISORY: WILL BE ISSUED BY 20190419/0600Z  
AAWU APR 2019 AAWU

**(VAA-2: Opala from VAAC Anchorage at 0419/0100)**

FVAK21 PAWU 190100

VAAAK1

VA ADVISORY

DTG: 20190419/0100Z

VAAC: ANCHORAGE

VOLCANO: OPALA 300080

PSN: N5233 E15720

AREA: KAMCHATKA PENINSULA

SUMMIT ELEV: 8120 FT (2475 M)

ADVISORY NR: 2019/002

INFO SOURCE: EXERCISE

AVIATION COLOR CODE: RED

ERUPTION DETAILS: THIS IS DRILL PORTION OF VOLKAM19

OBS VA DTG: 19/0100Z

OBS VA CLD: FL250/FL450 N5103 E15814 - N5209 E16016 - N5017  
E16321 - N4843 E15951 - N5103 E15814 MOV SE 215KT.

FCST VA CLD +6HR: 19/0700Z FL250/FL450 N5120 E16143 - N4312  
E17258 - N3957 E16529 - N5025 E15843 - N5120 E16143 - N5120  
E16143.

FCST VA CLD+12HR: 19/1300Z NO VA EXP.

FCST VA CLD+18HR: 19/1900Z NO VA EXP.

RMK: THE RESPONSIBILITY FOR THIS EVENT IS BEING TRANSFERRED  
TO VAAC WASHINGTON. THE NEXT ADVISORY WILL BE ISSUED BY  
VAAC WASHINGTON BY 0130 UTC UNDER HEADER FVXX2[012345]KNES.

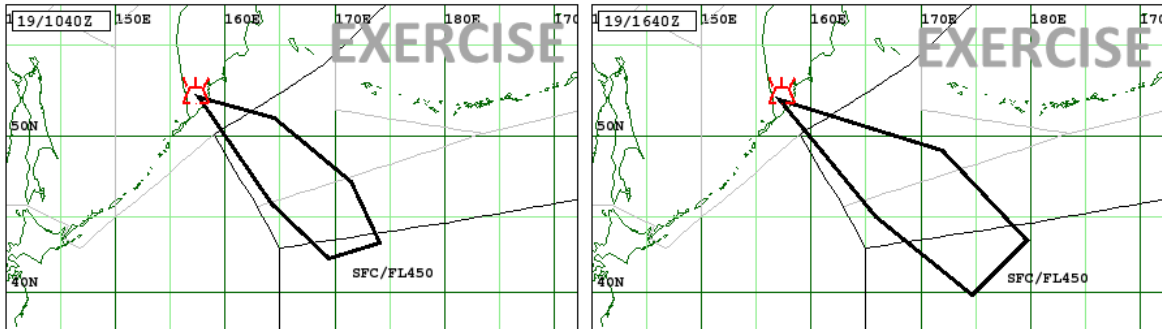
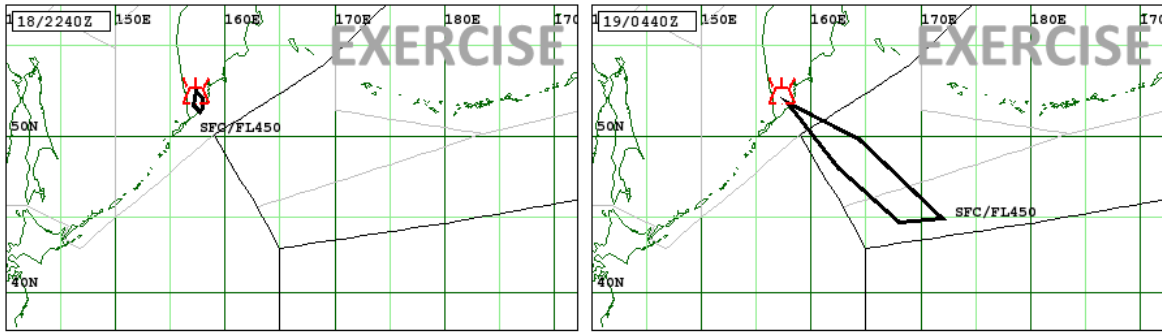
NXT ADVISORY: NO FURTHER ADVISORIES

AAWU APR 2019 AAWU

(VAA-1: Opala from VAAC Washington at 0419/0130)

FVXX27 KNES 190130  
VA ADVISORY  
DTG: 20190419/0130Z  
VAAC: WASHINGTON  
VOLCANO: OPALA 300080  
PSN: N5233 E15720  
AREA: KAMCHATKA  
SUMMIT ELEV: 8002 FT (2439 M)  
ADVISORY NR: 2019/001  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI. KVERT.  
ERUPTION DETAILS: VA EXERCISE VA CONTINUOUSLY OBS  
IN STLT IMAGERY  
OBS VA DTG: 19/0130Z  
OBS VA CLD: SFC/FL450 N4441 E16746 - N4251 E16924  
- N4116 E16559 - N4335 E16453 - N4441 E16746 MOV  
SE 220KT  
FCST VA CLD +6HR: 19/0730Z SFC/FL450 N4035 E17456  
- N3936 W17946 - N3708 E17844 - N3739 E17432 -  
N4035 E17456  
FCST VA CLD +12HR: 19/1330Z SFC/FL450 N4024  
W16747 - N3725 W16831 - N3708 W17205 - N3950  
W17151 - N4024 W16747  
FCST VA CLD +18HR: 19/1930Z SFC/FL450 N4059  
W15843 - N3735 W15846 - N3722 W16145 - N4028  
W16149 - N4059 W15843  
RMK: VA EXERCISE VOLKAM19. THE RESPONSIBILITY  
FOR THIS VA EVENT HAS BEEN TRANSERRED TO VAAC  
WASHINGTON FROM THE VAAC ANCHORAGE. ...KIBLER  
NXT ADVISORY: NO FURTHER ADVISORIES

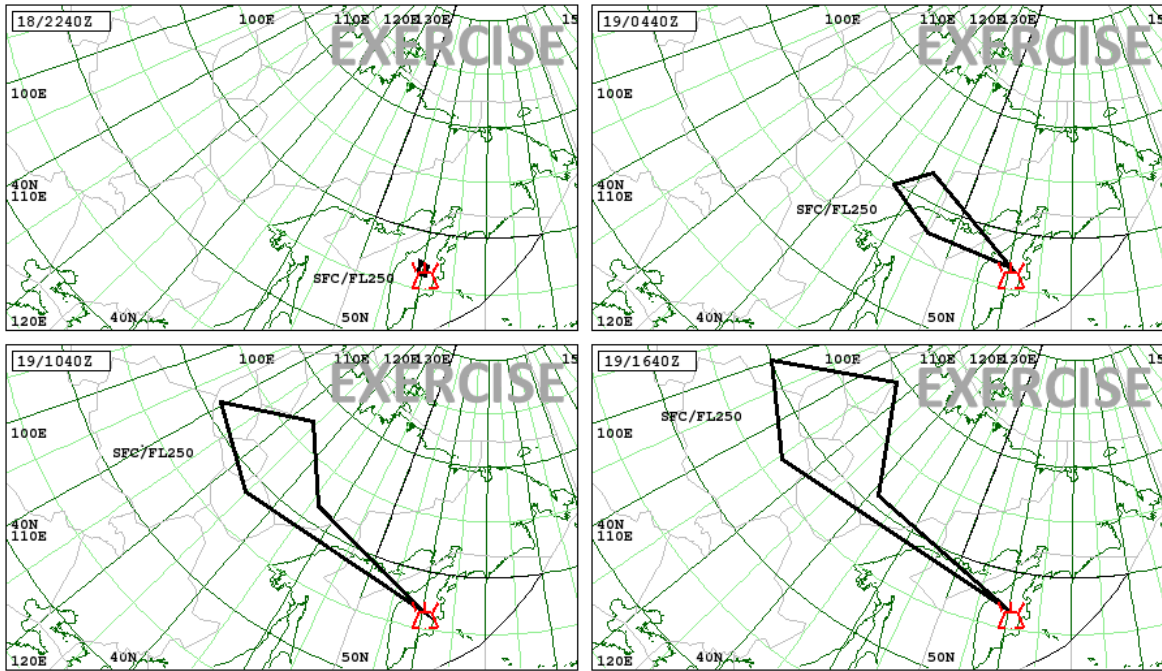
(VAG-1: Opala from VAAC Tokyo at 0418/2240)



VA ADVISORY  
DTG: 20190418/2240Z  
VAAC: TOKYO  
VOLCANO: OPALA 300080  
AREA: RUSSIA  
SUMIT ELEV: 2439M  
ADVISORY NR: 9999/2  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL

ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2145Z FL450  
EXTD SE REPORTED  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0000Z

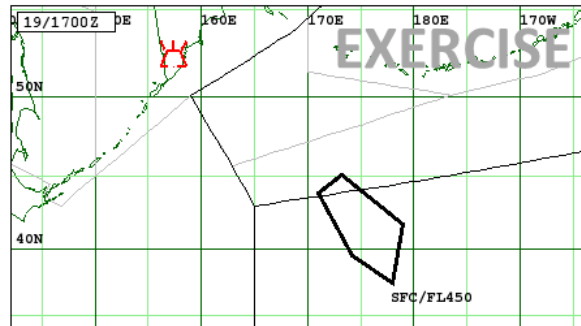
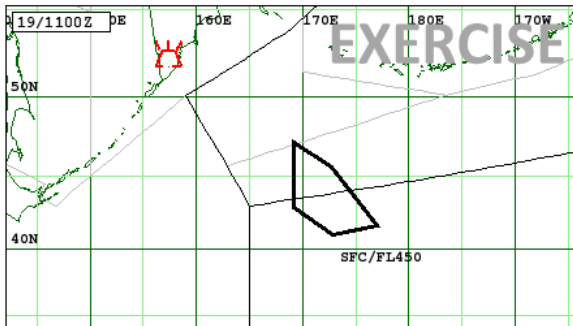
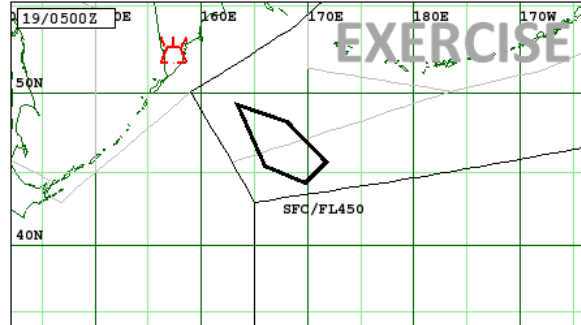
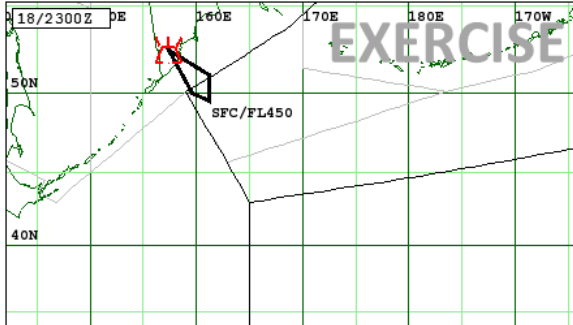
(VAG-2: Ushkovsky from VAAC Tokyo at 0418/2310)



VA ADVISORY  
DTG: 20190418/2310Z  
VAAC: TOKYO  
VOLCANO: USHKOVSKY 300261  
AREA: RUSSIA  
SUMIT ELEV: 3943M  
ADVISORY NR: 9999/2  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT UHPP  
AVIATION COLOUR CODE: NIL

ERUPTION DETAILS: VA EXERCISE ERUPTION AT 20190418/2215Z FL250  
EXTD NW REPORTED  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0000Z

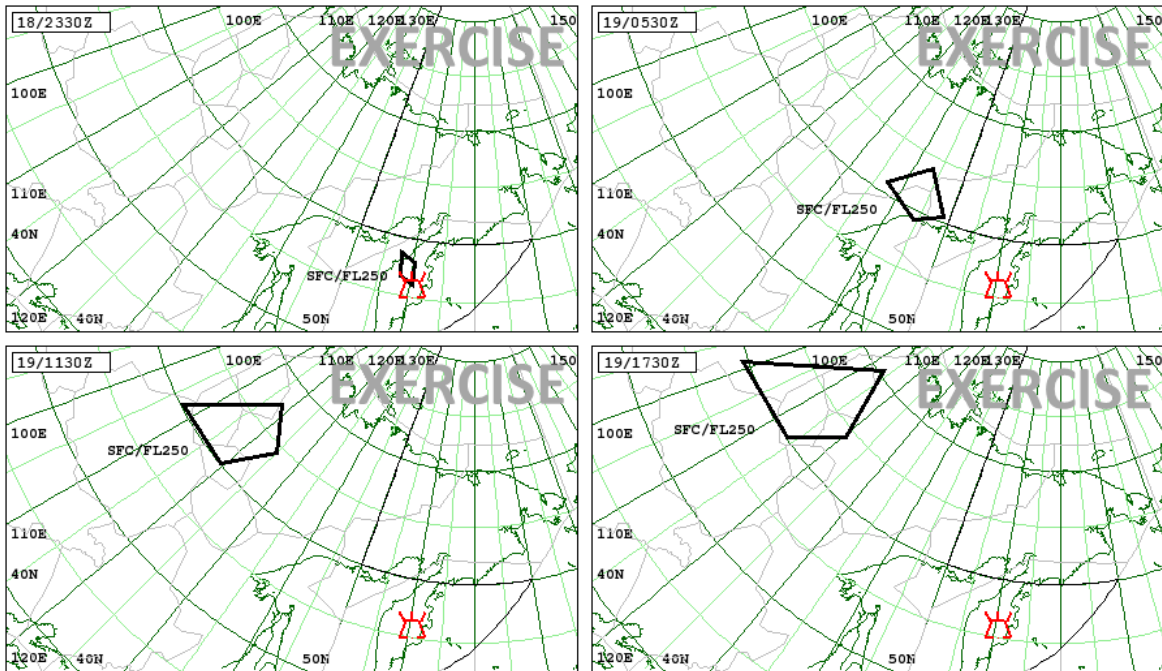
(VAG-3: Opala from VAAC Tokyo at 0418/2330)



VA ADVISORY  
DTG: 20190418/2330Z  
VAAC: TOKYO  
VOLCANO: OPALA 300080  
AREA: RUSSIA  
SUMIT ELEV: 2439M  
ADVISORY NR: 9999/3  
INFO SOURCE: VA EXERCISE VOLKAM18 HIMAWARI-8 KVERT  
AVIATION COLOUR CODE: NIL

ERUPTION DETAILS: VA EXERCISE VA CONTINUOUSLY OBS ON SATELLITE  
IMAGERY  
RMK: VA EXERCISE VOLKAM19  
THE RESPONSIBILITY FOR THIS ASH EVENT IS BEING TRANSFERRED TO  
VAAC ANCHORAGE. THE NEXT ADVISORY WILL BE ISSUED BY VAAC  
ANCHORAGE BY 0100UTC UNDER HEADER FVAK21 PAWU.  
EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO FURTHER ADVISORIES

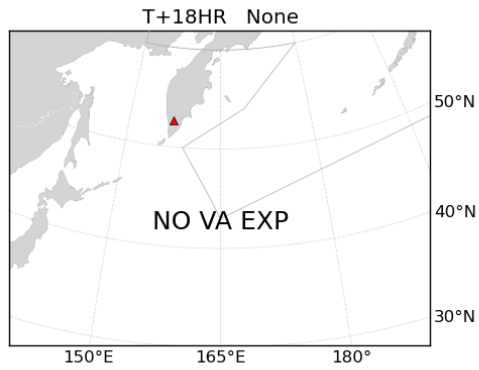
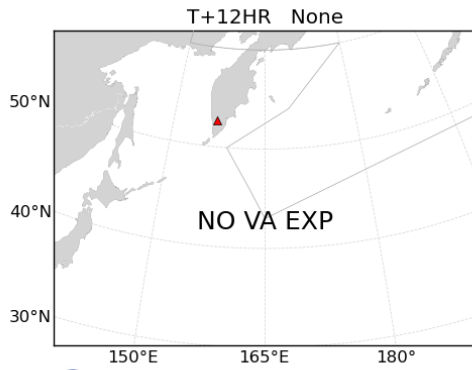
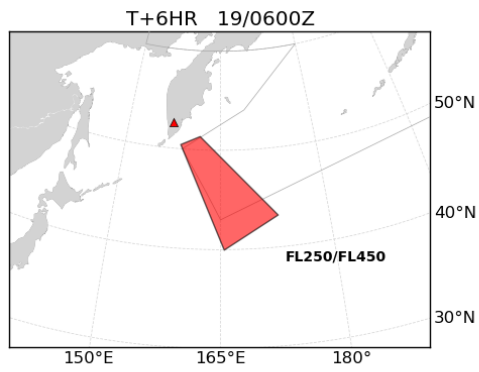
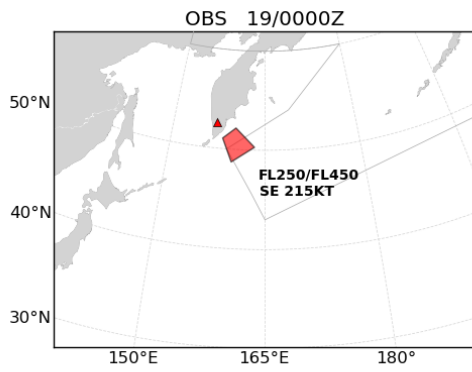
(VAG-4: Ushkovsky from VAAC Tokyo at 0419/0000)



VA ADVISORY  
DTG: 20190419/0000Z  
VAAC: TOKYO  
VOLCANO: USHKOVSKY 300261  
AREA: RUSSIA  
SUMMIT ELEV: 3943M  
ADVISORY NR: 9999/3  
INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI-8 KVERT  
AVIATION COLOUR CODE: NIL

ERUPTION DETAILS: VA CONTINUOUSLY OBS ON SATELLITE  
IMAGERY  
RMK: VA EXERCISE VOLKAM19 NIL EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: 20190419/0600Z

**(VAG-1: Opala from VAAC Anchorage at 0419/0000)**

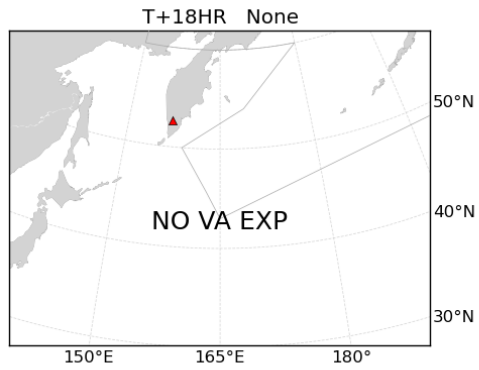
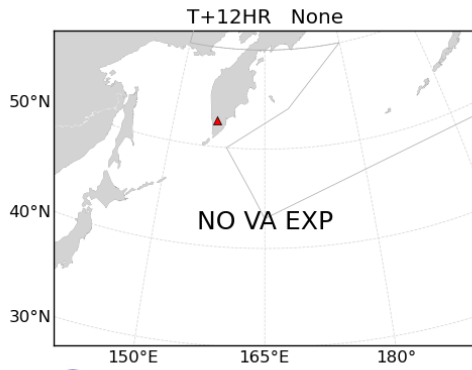
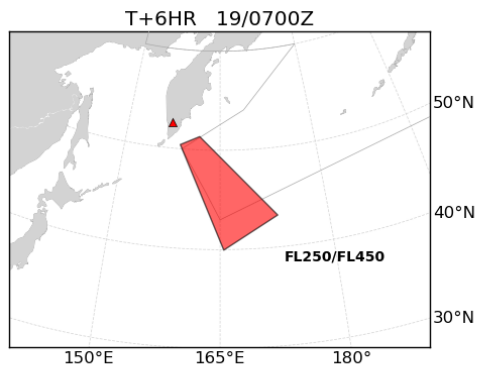
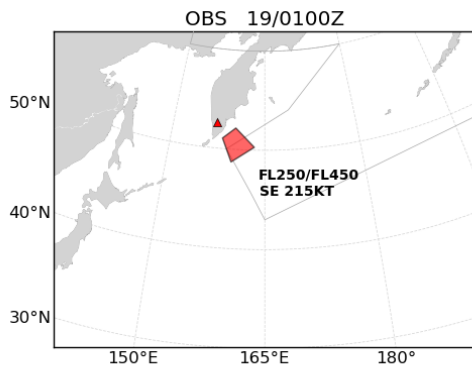


VOLCANIC ASH ADVISORY  
DTG: 20190419/0000Z  
VAAC: ANCHORAGE  
VOLCANO: OPALA 300080  
AREA: KAMCHATKA PENINSULA  
SUMMIT ELEV: 8120 FT (2475 M)  
ADVISORY NUM: 2019/001

INFO SOURCE: EXERCISE  
ERUPTION DETAILS: THIS IS DRILL PORTION OF VOLKAM19  
REMARKS: VAAC TOKYO HAS TRANSFERRED RESPONSIBILITY  
OF THIS EVENT TO VAAC ANCHORAGE. THIS ADVISORY  
UPDATES MESSAGE FVFE01 RJTD.  
NEXT ADVISORY: WILL BE ISSUED BY 20190419/0600Z



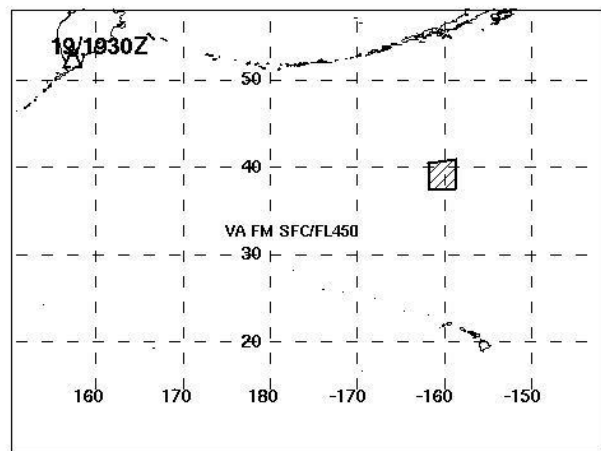
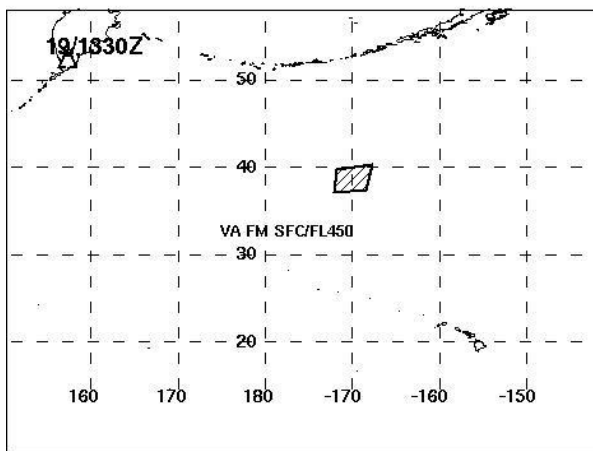
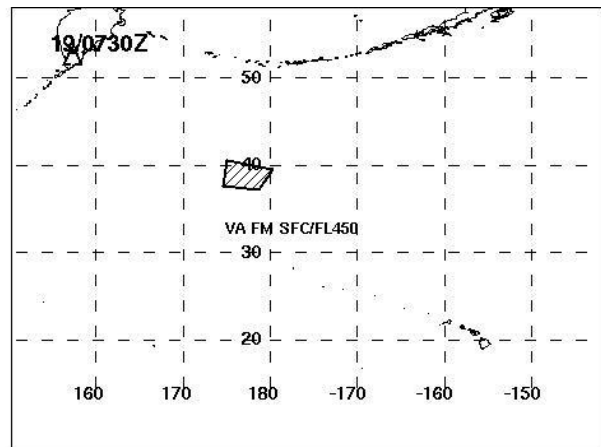
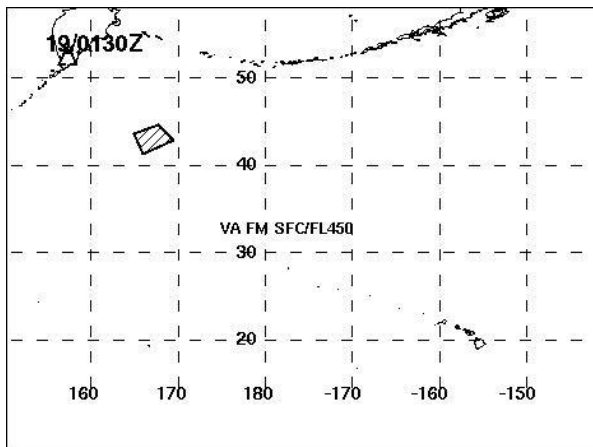
**(VAG-2: Opala from VAAC Anchorage at 0419/0100)**



VOLCANIC ASH ADVISORY  
DTG: 20190419/0100Z  
VAAC: ANCHORAGE  
VOLCANO: OPALA 300080  
AREA: KAMCHATKA PENINSULA  
SUMMIT ELEV: 8120 FT (2475 M)  
ADVISORY NUM: 2019/002

INFO SOURCE: EXERCISE PART OF VOLKAM19  
ERUPTION DETAILS: DRILL  
REMARKS: THE RESPONSIBILITY FOR THIS EVENT IS BEING  
TRANSFERRED TO VAAC WASHINGTON. THE NEXT ADVISORY  
WILL BE ISSUED BY VAAC WASHINGTON BY {HHMM} UTC  
UNDER HEADER FVXX2[012345] KNES.  
NEXT ADVISORY: NO FURTHER ADVISORIES

**(VAG-1: Opala from VAAC Washington at 0419/0130)**



VOLCANIC ASH ADVISORY  
 DTG: 20190419/0130Z  
 VAAC: WASHINGTON  
 VOLCANO: OPALA 300080  
 AREA: KAMCHATKA  
 SUMMIT ELEV: 8002 FT (2439 M)  
 ADVISORY NR: 2019/001

INFO SOURCE: VA EXERCISE VOLKAM19 HIMAWARI. KVERT.  
 ERUPTION DETAILS: VA EXERCISE VA CONTINUOUSLY OBS IN STL  
 IMAGERY  
 RMK: VA EXERCISE VOLKAM19. THE RESPONSIBILITY FOR THIS VA  
 EVENT HAS BEEN TRANSFERRED TO VAAC WASHINGTON FROM THE VAAC  
 ANCHORAGE. ...KIBLER  
 NXT ADVISORY: NO FURTHER ADVISORIES

**Routing of VAA:**

VAA is sent to

- Appropriate Regional OPMET exchange hub (e.g. for VAAC Tokyo to Regional OPMET Data Bank Tokyo at AFTN RJTDYZYX which then through the APAC ROBEX scheme should be available at Inter-regional OPMET Gateway (IROG) Singapore which provides data to EUR via IROG London – also note that IROG Tokyo provides data to NAM via IROG Washington)
- SADIS at AFTN address **EGZZWPXX**
- WIFS at AFTN address **KWBCYMYX**
- MATMC at AFTN address **UUUWZDZX**

Template for **SIGMET** messages from MWO Yelizovo/PK based on VAA from VAAC Tokyo

WVRA31 RUPK 182205  
UHPP SIGMET Z1 VALID 182205/182305 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT OPALA PSN N5233 E15720 VA CLD OBS AT 2145Z FL080/450 MOV SE 400KMH INTSF  
EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 182235  
UHPP SIGMET Z2 VALID 182235/182335 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT USHKOVSKY PSN N5604 E16028 VA CLD OBS AT 2215Z FL130/250 MOV NW 400KMH  
INTSF EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 182245  
UHPP SIGMET Z3 VALID 182245/190410 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT OPALA PSN N5233 E15720 VA CLD OBS AT 2210Z WI N5233 E15720 - N5209 E15800 -  
N5138 E15801 - N5125 E15742 - N5147 E15708 - N5233 E15720 SFC/FL450 NC FCST AT 0410Z  
WI N5022 E15944 - N5155 E15752 - N5052 E16102 - N5022 E15944 EXERCISE EXERCISE  
EXERCISE =

WVRA31 RUPK 182247  
UHPP SIGMET Z4 VALID 182247/182305 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z1  
182205/182305 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 182315  
UHPP SIGMET Z5 VALID 182315/190440 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT USHKOVSKY PSN N5604 E16028 VA CLD OBS AT 2240Z WI N5608 E16029 - N5619  
E15922 - N5720 E15914 - N5657 E16039 - N5608 E16029 SFC/FL250 NC FCST AT 0440Z WI  
N5827 E15459 - N5650 E16020 - N5714 E15226 - N5800 E15358 - N5827 E15459 EXERCISE  
EXERCISE EXERCISE =

WVRA31 RUPK 182317  
UHPP SIGMET Z6 VALID 182317/182335 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z2  
182235/182335 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 182335  
UHPP SIGMET Z7 VALID 182335/190500 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT OPALA PSN N5233 E15720 VA CLD OBS AT 2300Z WI N5014 E15925 - N5232 E15723 -  
N5106 E16108 - N5055 E16108 - N5014 E15925 SFC/FL450 MOV SE 410KMH NC FCST AT  
0500Z NO VA EXP EXERCISE EXERCISE EXERCISE =

WVRA31 RUPK 182337  
UHPP SIGMET Z8 VALID 182337/190410 UHPP-  
UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z3  
182245/190410 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190002

UHPP SIGMET Z1 VALID 190002/190530 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 VA ERUPTION  
MT USHKOVSKY PSN N5604 E16028 VA CLD OBS AT 2330Z WI N5608 E16029 - N5641  
E15820 - N5840 E15754 - N5759 E16015 - N5608 E16029 SFC/FL250 MOV NW 410KMH NC  
FCST AT 0530Z NO VA EXP EXERCISE EXERCISE EXERCISE =

WVRA31 RUPK 190003

UHPP SIGMET Z2 VALID 190003/190440 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z5  
182315/190440 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190005

UHPP SIGMET Z3 VALID 190005/190500 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR VA ERUPTION MT OPALA PSN N5233  
E15720 VA CLD OBS AT 0000Z WI N5002 E15855 - N5103 E15814 - N5209 E16016 - N5111  
E16150 - N5004 E15900 - N5002 E15855 FL250/450 WKN FCST 0500Z FL250/450 WI N5003  
E15857 - N5025 E15843 - N5120 E16143 - N5112 E16153 - N5004 E15900 - N5003 E15857  
EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190007

UHPP SIGMET Z4 VALID 190007/190500 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z7  
182335/190500 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190107

UHPP SIGMET Z5 VALID 190107/190700 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR VA ERUPTION MT OPALA PSN N5233  
E15720 VA CLD OBS AT 0100Z WI N5002 E15855 - N5103 E15814 - N5209 E16016 - N5111  
E16150 - N5004 E15900 - N5002 E15855 FL250/450 WKN FCST 0700Z WI N5003 E15857 - N5025  
E15843 - N5120 E16143 - N5112 E16153 - N5004 E15900 - N5003 E15857 EXERCISE EXERCISE  
EXERCISE=

WVRA31 RUPK 190110

UHPP SIGMET Z6 VALID 190110/190500 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z3  
190005/190500 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190200

UHPP SIGMET Z7 VALID 190200/190530 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z1  
190002/190530 EXERCISE EXERCISE EXERCISE=

WVRA31 RUPK 190202

UHPP SIGMET Z8 VALID 190202/190700 UHPP-

UHPP PETROPAVLOVSK-KAMCHATSKY FIR/UIR EXERCISE VOLKAM19 CNL SIGMET Z5  
190107/190700 EXERCISE EXERCISE EXERCISE=

**Template for SIGMET messages from MWO Magadan based on VAA from VAAC Tokyo**

WVRA31 RUMG 182320

UHMM SIGMET Z1 VALID 190440/191040 UHMM-  
UHMM MAGADAN FIR EXERCISE VOLKAM19 VA ERUPTION MT USHKOVSKY  
PSN N5604 E16028 VA CLD FCST WI N6148 E14513 - N5846 E15539 - N5728 E15250 -  
N5735 E14538 - N5741 E14516 - N5800 E14545 - N6100 E14600 - N6148 E14513  
SFC/FL250 FCST AT 1040Z WI N6019 E14557 - N5817 E15434 - N5747 E15329 - N5842  
E14548 - N6019 E14557 EXERCISE EXERCISE EXERCISE=

WVRA31 RUMG 190010

UHMM SIGMET Z1 VALID 190530/191130 UHMM-  
UHMM MAGADAN FIR EXERCISE VOLKAM19 VA ERUPTION MT USHKOVSKY  
PSN N5604 E16028 VA CLD FCST WI N6250 E14515 - N6027 E14844 - N5944 E14553 -  
N6100 E14600 - N6200 E14500 - N6250 E14515 SFC/FL250 MOV NW 410KMH  
EXERCISE EXERCISE EXERCISE=

WVRA31 RUMG 190015

UHMM SIGMET Z2 VALID 190440/191040 UHMM-  
UHMM MAGADAN FIR EXERCISE VOLKAM19 CNL SIGMET Z1 190440/191040  
EXERCISE EXERCISE EXERCISE=

WVRA31 RUMG 190200

UHMM SIGMET Z3 VALID 190530/191130 UHMM-  
UHMM MAGADAN FIR EXERCISE VOLKAM19 CNL SIGMET Z1 190530/191130  
EXERCISE EXERCISE EXERCISE=

**Template for SIGMET messages in exercise – MWO Anchorage**

WVAK01 PAWU 190000

WSVAK1

ANCI WS 190000

PAZA SIGMET INDIA 1 VALID 190000/190600 PANC-

ANCHORAGE OCEANIC FIR VA ERUPTION OPALA VOLCANO PSN N5233 E15720

VA CLDS OBS AT 2355Z WI N5103 E15814 – N5209 E16016 – N5017

E16321 – N4843 E15951 – N5103 E15814. FL250-FL450. MOV SE 215KT.

NC.

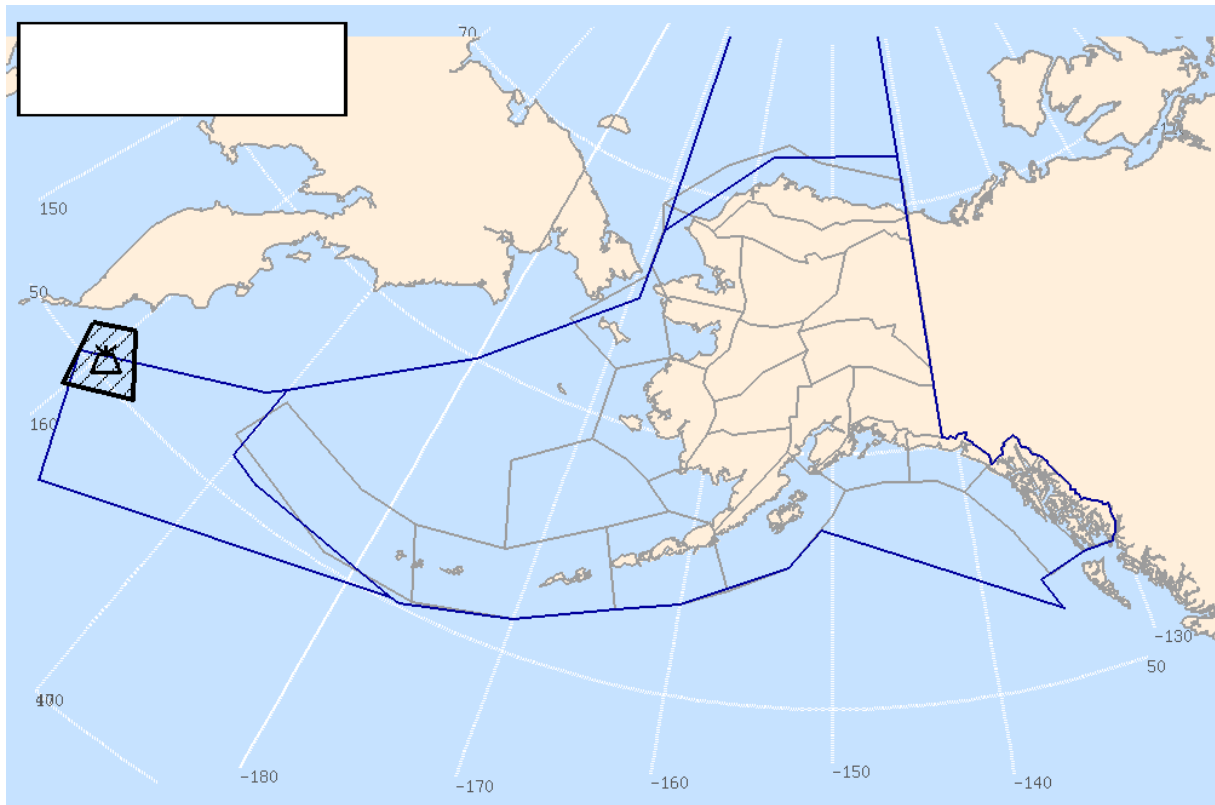
FCST 0600Z VA CLD WI N5120 E16143 – N4312 E17258 – N3957 E16529 –

N5025 E15843 – N5120 E16143 – N5120 E 16143. FL250/FL450.

THIS IS AN EXERCISE PORTION OF VOLKAM19

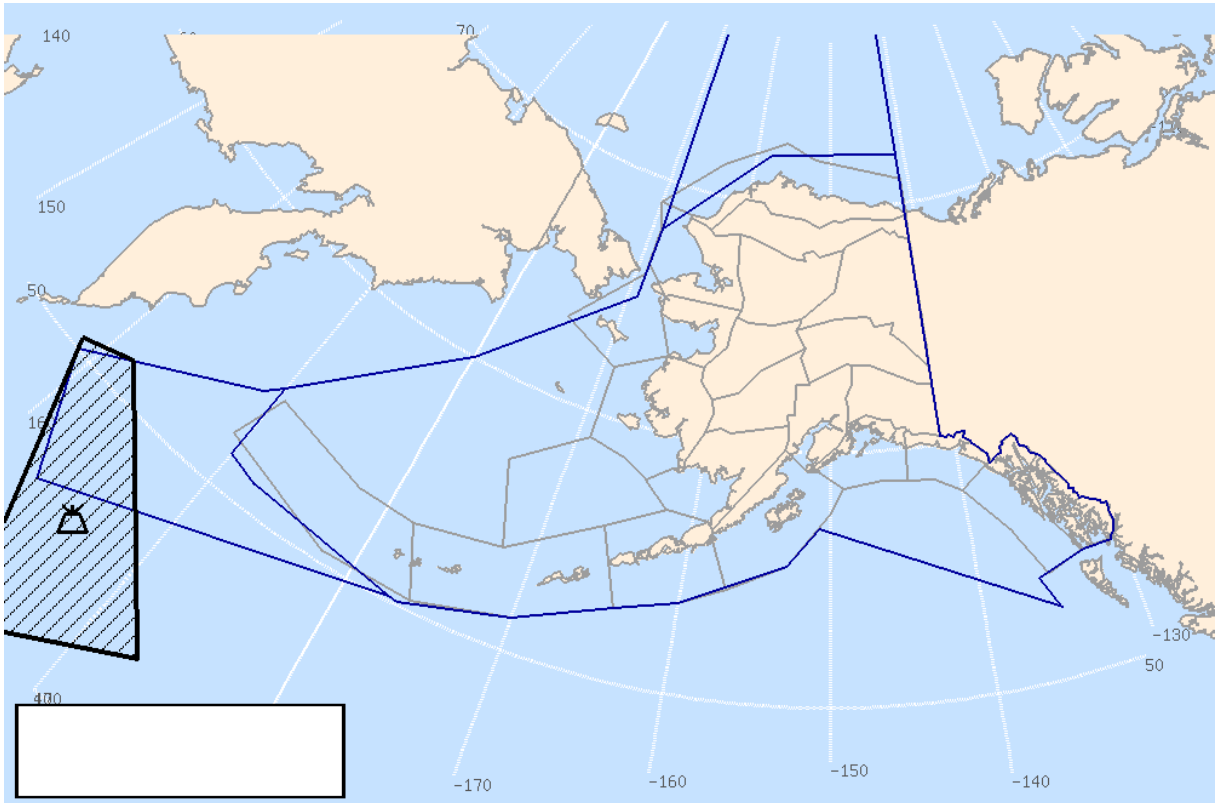
AAWU APR2019 AAWU

And in graphic form



Graphic created Feb 01 23:56 UTC





Graphic created Feb 01 23:56 UTC



**Coordination with adjacent FIRs**

Coordination on issuance of SIGMET between Yelizovo MWO, Magadan MWO and MWO responsible for Anchorage FIR and MWO responsible for Oakland FIR should be done to be sure information does not conflict on the FIR boundary.

**Routing of SIGMET:**

SIGMET is sent to

- Appropriate ROC
  - For far E Russian Federation - ROC Vienna at AFTN address **LOWMMMXX**
  - For Japan – RODB Tokyo at AFTN address **RJTDYPYX**
- SADIS at AFTN address **EGZZWPXX**
- WIFS at AFTN address **KWBCYMYX**
- VAAC Tokyo at AFTN address **RJTDYMYX**
- MATMC at AFTN address **UUWZDZX**
- Petropavlovsk-Kamchatsky ACC at AFTN address **UHPPZRZX**

*Note: ICAO RO MET verifies that this information is available on SADIS and WIFS.*



**NOTAM** to be promulgated seven days prior to the exercise by Russian Federation and United States:

(PXXXX/19 NOTAMN

Q) UUXX/QWWLW/IV/NBO/W/000/999/

A) UHPP UHMM B)1904182200 C)1904190200

E) EXERCISE VOLKAM19

ICAO VOLCANIC ASH EXERCISE WILL TAKE PLACE FROM 2200 UTC 18 APR TO 0200 UTC 19 APR 2019.

EXERCISE NAME: VOLKAM19.

EXERCISE VOLCANOES:

-USHKOVSKY 300261 N560412 E1602816 RUSSIAN FEDERATION-KAMCHATKA;

-OPALA 300080 N513234 E1572019 RUSSIAN FEDERATION-KAMCHATKA.

ANY PUBLICATION SUCH AS NOTAM, ASHTAM, SIGMET, CHARTS PUBLISHED FOR

AND IN RELATION TO THE EXERCISE SHALL BE DISREGARDED AND NOT BE USED FOR OPERATIONAL PURPOSES.

FREE TEXT OF PROMULGATED EXERCISE NOTAM STARTS WITH:

EXERCISE VOLKAM19, ENDS WITH:

EXERCISE EXERCISE EXERCISE

F) SFC

G) UNL)

(AXXXX/19 NOTAMN

Q) PAZA/QXXXX/IV/NBO/W/000/999/

A) PAZA B)1904182200 C)1904190200

E) EXERCISE VOLKAM19

ICAO VOLCANIC ASH EXERCISE WILL TAKES PLACE FROM 2200 UTC 18 APR TO 0200 UTC 19 APR 2019.

EXERCISE NAME: VOLKAM19.

EXERCISE VOLCANOES:

-USHKOVSKY 300261 N560412 E1602816 RUSSIAN FEDERATION-KAMCHATKA;

-OPALA 300080 N513234 E1572019 RUSSIAN FEDERATION-KAMCHATKA.

ANY PUBLICATION SUCH AS NOTAM, ASHTAM, SIGMET, CHARTS PUBLISHED FOR

AND IN RELATION TO THE EXERCISE SHALL BE DISREGARDED AND NOT BE USED FOR OPERATIONAL PURPOSES.

FREE TEXT OF PROMULGATED EXERCISE NOTAM STARTS WITH:

EXERCISE VOLKAM19, ENDS WITH:

EXERCISE EXERCISE EXERCISE

F) SFC

G) UNL)

**Example NOTAM** to be provided by NOF Moscow at approximately **2205 UTC**

(Pxxxx/19 NOTAMN

Q) UUXX/QWWXX/IV/NBO/W/000/450/5233N15720E999

A) UHPP UHHH UHMM      B) 1904182205 C) 1904182305EST

D)

E) EXERCISE VOLKAM19 EXPLOSIVE ERUPTION OF VOLCANO **OPALA** 300080  
N52 33 E157 20 RUSSIAN FEDERATION-KAMCHATKA AS REPORTED BY  
VOLCANO OBSERVATORY AT 22:00 UTC WITH COLOUR CODE RED. VOLCANIC  
ASH PLUME IS AT FL450 MOVING SE  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL450)

**Example NOTAM** to be provided by NOF Moscow at approximately **2235 UTC**

(Pxxxx/19 NOTAMN

Q) UUXX/QWWXX/IV/NBO/W/000/450/5604N16028E999

A) UHPP UHHH UHMM      B) 1904182235 C) 1904182335EST

D)

E) EXERCISE VOLKAM19 EXPLOSIVE ERUPTION OF VOLCANO **USHKOVSKY**  
300261 N56 04 E160 28 RUSSIAN FEDERATION-KAMCHATKA AS REPORTED BY  
VOLCANO OBSERVATORY AT 22:30 UTC WITH COLOUR CODE RED. VOLCANIC  
ASH PLUME IS AT FL250 MOVING NW  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL250)

**Example NOTAM** to be provided by NOF Moscow at approximately **2240UTC**

(Pxxxx/19 NOTAMR Pxxxx/19

Q) UUXX/QWWXX/IV/NBO/W/000/450/5233N15720E999

A) UHPP UHHH UHMM      B) 1904182240 C) 1904190040EST

D)

E) EXERCISE VOLKAM19 EXPLOSIVE ERUPTION OF VOLCANO **OPALA** IN  
PROGRESS 300080 N52 33 E157 20 RUSSIAN FEDERATION-KAMCHATKA AS  
REPORTED BY VOLCANO OBSERVATORY AT 22:00 UTC WITH COLOUR CODE  
RED. VOLCANIC ASH PLUME IS AT FL450 MOVING SE  
REFERENCE VOLCANIC ASH ADVISORIES (VAA) AND VOLCANIC ASH  
ADVISORY INFORMATION IN GRAPHICAL FORM (VAG) PROVIDED BY  
VOLCANIC ASH ADVISORY CENTRE (VAAC) TOKYO AS WELL AS SIGMET  
ISSUED BY RESPECTIVE METEOROLOGICAL WATCH OFFICES  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL450 )

**Example NOTAM** to be provided by NOF Moscow at approximately **2300UTC**

(Pxxxx/19 NOTAMR Pxxxx/19

Q) UUXX/QWWXX/IV/NBO/W/000/450/5233N15720E999

A) UHPP UHHH UHMM  
D)

B) 1904182300 C) 1904190200

E) EXERCISE VOLKAM19 END OF VOLCANIC ERUPTION OF VOLCANO **OPALA**  
300080 N52 33 E157 20 RUSSIAN FEDERATION-KAMCHATKA AS REPORTED BY  
VOLCANO OBSERVATORY AT 23:00 UTC WITH COLOUR CODE ORANGE.  
VOLCANIC ASH PLUME IS AT FL450 MOVING SE  
VOLCANIC ASH STILL PRESENT DOWNSTREAM OF VOLCANO  
REFERENCE VOLCANIC ASH ADVISORIES (VAA) AND VOLCANIC ASH  
ADVISORY INFORMATION IN GRAPHICAL FORM (VAG) PROVIDED BY  
VOLCANIC ASH ADVISORY CENTRE (VAAC) TOKYO OR VAAC ANCHORAGE OR  
VAAC WASHINGTON AS WELL AS SIGMET ISSUED BY RESPECTIVE  
METEOROLOGICAL WATCH OFFICES  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL450)

**Example NOTAM** to be provided by NOF Moscow at approximately **2310UTC**

(Pxxxx/19 NOTAMR Pxxxx/19

Q) UUXX/QWWXX/IV/NBO/W/000/250/5604N16028E999

A) UHPP UHHH UHMM B) 1904182310 C) 1904190110EST

D)

E) EXERCISE VOLKAM19 EXPLOSIVE ERUPTION OF VOLCANO **USHKOVSKY** IN  
PROGRESS 300261 N56 04 E160 28 RUSSIAN FEDERATION-KAMCHATKA AS  
REPORTED BY VOLCANO OBSERVATORY AT 22:30 UTC WITH COLOUR CODE  
RED. VOLCANIC ASH PLUME IS AT FL250 MOVING NW  
REFERENCE VOLCANIC ASH ADVISORIES (VAA) AND VOLCANIC ASH  
ADVISORY INFORMATION IN GRAPHICAL FORM (VAG) PROVIDED BY  
VOLCANIC ASH ADVISORY CENTRE (VAAC) TOKYO AS WELL AS SIGMET  
ISSUED BY RESPECTIVE METEOROLOGICAL WATCH OFFICES  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL250 )

**Example NOTAM** to be provided by NOF Moscow at approximately **2330UTC**

(Pxxxx/19 NOTAMR Pxxxx/19

Q) UUXX/QWWXX/IV/NBO/W/000/250/5604N16028E999

A) UHPP UHHH UHMM

B) 1904182330 C) 1904190200

D)

E) EXERCISE VOLKAM19 END OF VOLCANIC ERUPTION OF VOLCANO  
**USHKOVSKY** 300261 N56 04 E160 28 RUSSIAN FEDERATION-KAMCHATKA AS  
REPORTED BY VOLCANO OBSERVATORY AT 23:30 UTC WITH COLOUR CODE  
ORANGE. VOLCANIC ASH PLUME IS AT FL250 MOVING NW  
VOLCANIC ASH STILL PRESENT DOWNSTREAM OF VOLCANO  
REFERENCE VOLCANIC ASH ADVISORIES (VAA) AND VOLCANIC ASH  
ADVISORY INFORMATION IN GRAPHICAL FORM (VAG) PROVIDED BY  
VOLCANIC ASH ADVISORY CENTRE (VAAC) TOKYO OR VAAC ANCHORAGE OR  
VAAC WASHINGTON AS WELL AS SIGMET ISSUED BY RESPECTIVE  
METEOROLOGICAL WATCH OFFICES  
EXERCISE EXERCISE EXERCISE

F) SFC

G) FL250)

**Routing of NOTAM**

NOTAM is sent to SADIS/WIFS Gateway at **EGZZVANW**

**Example - Special air-report on volcanic ash – example in Petropavlovsk-Kamchatsky FIR**

- **pilot to ACC**
  - A pilot provides a special air-report on volcanic ash via voice communications to ACC. Simulated reports can be sent from dispatch to PK ACC via AFTN (**UHPPZRZX**) for reports in the **PK FIR**. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example is provided.

**‘AIREP SPECIAL EXERCISE VOLKAM19 UNITED AIRLINES TREE TOO TOO POSITION FIFE ZERO ZERO ZERO NORTH WUN FIFE FIFE TOO TOO EAST FLIGHT LEVEL TREE FIFE ZERO CLIMBING TO FLIGHT LEVEL FOWer ZERO ZERO VOLCANIC ASH CLOUD EXERCISE VOLKAM19 EXERCISE EXERCISE EXERCISE‘**

- **ACC Petropavlovsk-Kamchatsky (PKK) to MWO Yelizovo**

*There are different arrangements between ACC and MWO (e.g. information provided by fax or phone vs. AFTN). The following is an example of providing a special air-report from the ACC to the MWO via AFTN.*

- The format used for forwarding of meteorological information received by voice communications to the associated meteorological watch office (MWO) is provided in subtitle 3 of Appendix 1 of PANS-ATM. An example is provided based on the information given by the pilot or dispatch.
- **ARS EXERCISE VOLKAM19 UAL322 5000N15600E 2315 F350 ASC F400 VA CLD EXERCISE EXERCISE EXERCISE=**
- **MWO Yelizovo to VAAC Tokyo, Regional OPMET Centre-ROC Vienna, SADIS, WIFS**
  - The format used for forwarding of a special air-report from the MWO to VAAC, ROC, SADIS and WIFS is in accordance to Annex 3, Appendix 6, Table A6-1B (**uplink**). An example is provided based on the informaton given by the ACC.
  - **ARS EXERCISE VOLKAM19 UA322 VA CLD OBS AT 2115Z N500E15600 FL350/400 EXERCISE EXERCISE EXERCISE=**
  - The MWO should send this information using the World Meteorological Organization Abbreviated Header Line (WMO AHL) of **UARA71 RUPK** to:
    - Appropriate VAAC – in this case, VAAC Tokyo (fax: +81 (3) 3212 6446; email [vaac.tokyo@volash.kishou.go.jp](mailto:vaac.tokyo@volash.kishou.go.jp); AFTN address **RJTDYMYX**)
    - Appropriate ROC – in this case, ROC Vienna at AFTN address **LOWMMMXX**
    - SADIS at AFTN address **EGZZWPXX**
    - WIFS at AFTN address **KWBCYMYX**
    - MATMC at AFTN address **UUUWZDZX**

**Example - Special air-report on volcanic ash – example in Fukuoka FIR**

- **pilot to ACC**
  - A pilot provides a special air-report on volcanic ash via voice communications to ACC. Simulated reports can be sent to Fukuoka ATMC (**RJJZOO**) and Tokyo Radio (**RJAAYSX**) for reports in the **Fukuoka FIR**. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example is provided.

**‘AIREP SPECIAL EXERCISE VOLKAM19 JAPAN AIRLINES TREE POSITION FIVE ZERO ZERO ZERO NORTH WUN FIFE FIFE TOO TOO EAST FLIGHT LEVEL TREE FIFE ZERO CLIMBING TO FLIGHT LEVEL FOWer ZERO ZERO VOLCANIC ASH CLOUD EXERCISE VOLKAM19 EXERCISE EXERCISE EXERCISE‘**

- **ACC to MWO**

*There are different arrangements between ACC and MWO (e.g. information provided by fax or phone vs. AFTN). The following is an example of providing a special air-report from the ACC to the MWO via AFTN.*

- The format used for forwarding of meteorological information received by voice communications to the associated meteorological watch office (MWO) is provided in subtitle 3 of Appendix 1 of PANS-ATM. An example is provided based on the information given by the pilot or dispatch.
- **ARS EXERCISE VOLKAM19 JAL3 5000N15600E 0050 F350 ASC F400 VA CLD EXERCISE EXERCISE EXERCISE=**
- **MWO Tokyo to VAAC Tokyo, Regional OPMET Centre-ROC/Regiona OPMET Data Bank (RODB) Tokyo, SADIS, WIFS**
  - The format used for forwarding of a special air-report from the MWO to VAAC, ROC, SADIS and WIFS is in accordance to Annex 3, Appendix 6, Table A6-1B (**uplink**). An example is provided based on the informaton given by the ACC.
  - **ARS EXERCISE VOLKAM19 JAL3 VA CLD OBS AT 0050Z N5000E15600 FL350/400 EXERCISE EXERCISE EXERCISE=**
  - The MWO should send this information using the World Meteorological Organization Abbreviated Header Line (WMO AHL) of **UAJP71 RJTD** to:
    - Appropriate VAAC – in this case, VAAC Tokyo (fax: +81 (3) 3212 6446; email [vaac.tokyo@volash.kishou.go.jp](mailto:vaac.tokyo@volash.kishou.go.jp); AFTN address **RJTDYMYX**)
    - Appropriate ROC – in this case, ROC Tokyo at AFTN address **RJTDYZYX**
    - SADIS at AFTN address **EGZZWPXX**
    - WIFS at AFTN address **KWBCYMYX**
    - MATMC at AFTN address **UUUWZDZX**

When absence of visible ash is observed by pilots, follow procedures in section 4.7 of the Handbook on the International Airways Volcano Watch (IAVW) that is reproduced here within.

*In the event of an eruption, operators should request their pilots to report, when appropriate, any observation related to a volcanic ash cloud including the absence of visible ash and all other relevant information such as observational conditions. The operator should then forward this information to the associated VAAC in a timely manner.*

*Note. – Visible ash is defined in the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691).*

## Case example on re-routing

*Example provided by American Airlines with input by United Airlines and Delta Airlines*

AAL procedures used to route around areas of known, or forecast, volcanic ash are similar to those used for any other type of weather (i.e. turbulence, thunderstorms, etc.). Avoidance during pre-flight planning is straightforward since well established procedures are in place with both the aircraft operators and air traffic service providers for filing, cancelling and re-filing flight plans prior to departure. The operators also have much more flexibility at this stage since the fuel load can still be adjusted.

Once a flight has departed, options become much more limited, and coordination between the dispatcher, flight crew and air traffic control become much more complicated and time consuming. What is outlined below is what we do at AAL. However, the procedures at other operators should be similar.

Once the notification of an eruption is received by the Dispatcher (usually via the first volcanic ash advisory), its potential impact is immediately evaluated with respect to flights that are already en-route. Impacted flights are provided with all pertinent information. ACARS is the primary means of relaying this information; however SATCOM voice is also available. HF phone patch and relay through ATC are used as a last resort. Flights whose routes will be impacted in the near term (usually within a couple of hours), are dealt with first. If, based on the initial information, the eruption looks to be major (ash extending into the upper atmosphere, or affecting a destination) we will consult with our meteorologists to further evaluate the impact.

Our procedures indicate that we must avoid known, or forecast, areas of visible and discernable volcanic ash. Our weather services provider (WSI) provides custom SIGMET products for these areas, which are controlling for our operation. All other available information (government issued SIGMETs, VAAs, VAGs, etc.) is evaluated, but is considered advisory for our operation. Visible and discernable volcanicash areas must be avoided by at least 60nm laterally (Weather Services International SIGMETS include the 60nm buffer). We also have procedures that allow us to overfly these areas in some situations. There are very specific conditions that must be met. These overflight procedures essentially treat the ash area as mountainous terrain for engine failure and depressurization situations.

Once it is determined which, if any, flights are impacted, they are worked starting with those closest to the eruption. Possible reroutes are evaluated by the Dispatcher that would allow flights to avoid the impacted areas. Fuel is the prime consideration. If it is determined that the impacted area cannot be avoided, and still arrive at the scheduled destination with the required fuel reserves, an enroute landing (or return to the point of origin) is planned. The Dispatcher will then coordinate the diversion with the flight crew.

If a possible alternate route is an option with the fuel remaining, the Dispatcher will contact the flight for concurrence and coordination. Once the Dispatcher and Captain agree on a course of action, the Dispatcher will create the new flight plan and provide the details to the crew (usually via ACARS). At this point coordination with ATC will begin.

Providing the new/requested flight plan information to Air Traffic Control once a flight has departed, can be the most difficult, confusing and time consuming step in the process. Anything that can be done to streamline the process will be of immense help to the operators. Dispatchers are often dealing with several impacted flights simultaneously in these types of situations. Most of the time, this



coordination involves the crew reading the entire new route to the controller working them at the time. (Consider use of SATCOM voice between the flight and Anchorage center, if not in VHF coverage) This both ties up the frequency in use, and distracts the flight crew and controller from their primary duties which has an impact on flight safety. A better solution may be for Air Traffic to be able to accept a revised FPL after departure. The revised FPL could include some type of remark in Field 18 like 'INFLIGHT REROUTE REQUEST DUE VOLCANIC ASH'. A procedure like this could also be used in the case of other types of contingencies.

Once the affected flights have been handled for the near term, the situation is continuously monitored for changes. If needed, plans are re-evaluated and the process above repeats itself until the situation improves.

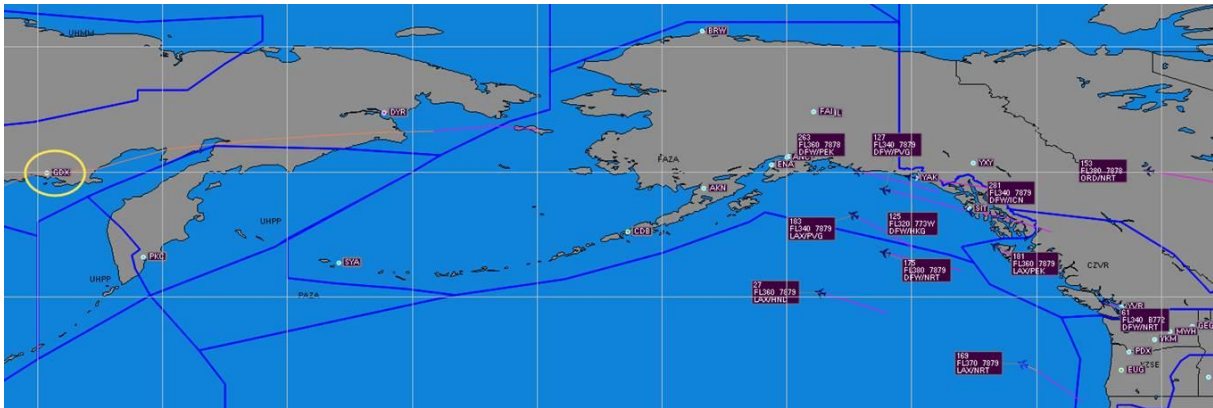
Note from UAL:

Part of the complexity with a Russian re-route is that Moscow wants to review the re-route prior to the FIRs accepting it rather than the FIRs just accepting a new FPL and coordinating the transfer of control from Anchorage or the JCAB (eastbound). You may want to point this out in your procedures.

### Example on Diversion

AAL will once again participate in a diversion exercise during VOLKAM 19. This year the plan is to use Magadan GDX/UHMM as the diversion airport. The specific flight will be selected on the day of the exercise based on actual flight operations and routings compared with the simulated ash cloud. The types of aircraft that may be utilized are B787-8, B787-9, B777-200 or B777-300. As with last year's exercise, AAL plans to combine this exercise with their annual FAA required Polar Diversion Recover Audit. This simulated diversion will be coordinated with AAL handling agent Global Aviation Consultants. Other elements could be simulated such as permission requests for re-departure, FPLs, etc.

Location of potential diversion flights on 25Feb, 2019 at 2200 UTC





**EXERCISE MEMORANDUM OF UNDERSTANDING  
BETWEEN  
MAGADAN AREA CONTROL CENTER (MAGADAN ACC)  
OF THE RUSSIAN FEDERATION  
AND  
THE AIR TRAFFIC MANAGEMENT CENTER (FUKUOKA ATMC)  
OF JAPAN CIVIL AVIATION BUREAU (JCAB)**

**EFFECTIVE: April 18, 2019**

**SUBJECT: PROCEDURES OF COORDINATING OF DEVIATION WHICH IS  
BEYOND FIR BOUNDARY BETWEEN RUSSIAN AND JAPAN  
AIRSPACE IN VOLKAM19 EXERCISE**

**1. PURPOSE:**

The purpose of this Exercise MEMORANDUM OF UNDERSTANDING (MOU) is to promote coordination and collaboration between MAGADAN ACC and FUKUOKA ATMC (hereinafter referred to as Centers) in VOLKAM19 EXERCISE.

This MOU sets forth procedures that will facilitate the safe and efficient movement of air traffic during VAA avoidance Exercise (VOLKAM19).

**2. SCOPE:**

The procedures outlined herein are for efficient use of deviation coordination among Centers.

**3. CANCELLATION:** The EXERCISE Memorandum of Understanding  
Subject: PROCEDURES OF COORDINATING OF DEVIATION WHICH IS BEYOND  
THE FIR BOUNDARY BETWEEN RUSSIAN AND JAPAN AIRSPACE IN  
VOLKAM19 EXERCISE

Dated on April 19, 2019 at 0200UTC is cancelled.

**4. DURATION:**

This AGREEMENT will remain in effect from 2200UTC April 18, 2019 through 0200UTC April 19, 2019.

**5. PROCEDURES OF COORDINATING DEVIATION**

The Centers shall conduct a coordination if there are aircraft requesting deviation which will proceed beyond FIR boundary.

The telephone number of each Centers and considerations are stated in attachment.

Deviation coordination shall include the following information

- (1) Aircraft identification
- (2) Geographical point where the aircraft will cross the common FIR boundary
- (3) Altitude
- (4) The distance of deviation width from the common FIR boundary
- (5) Any pertinent remarks

The transferring center shall notify the receiving center the information as soon as possible when the coordinated deviation will have completed (It means received message as “BACK ON ROUTE “from the aircraft)

**6. COMMUNICATION MEANS:**

A. The means of communication among Centers shall be commercial phone.

B. The Centers shall advise each other of any changes in telephone numbers.

**7. REVIEW AND MODIFICATION:**

This agreement will be reviewed as necessary. Modifications to this agreement may be accomplished anytime by mutual consent except *Attachment* which will be updated as necessary.

**Attachment**

1. Communications

**MAGADAN ACC of RUSSIA**

Commercial telephone number: + 7 4132 607-180 (H24)

**FUKUOKA ATMC**

Commercial telephone number: +81-92-608-8891(H24)

2. Coordination by telephone-communication are carried out in English.

3. In case of communication failure between MAGADAN ACC and Fukuoka ATMC caused by telephone circuit malfunction, to ask Anchorage ARTCC for relay of message to both facilities is appropriate as tentative procedure.

Note that VAAC Tokyo uses the maximum height of volcanic ash reported if differences in volcanic ash height are reported from various sources (satellite, aircraft report, VAA).

Useful websites:

VAAC-Tokyo [https://ds.data.jma.go.jp/svd/vaac/data/ex\\_web/VOLKAM19/index.html](https://ds.data.jma.go.jp/svd/vaac/data/ex_web/VOLKAM19/index.html)

(available approximately one week before the exercise)

VAAC Anchorage <https://www.weather.gov/vaac/vaalist>

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

KVERT <http://www.kscnet.ru/ivs/kvert/van/>

Alaska Volcano Observatory (AVO) <https://www.avo.alaska.edu/>

SADIS <ftp://username:password@sadisftp.metoffice.gov.uk> (note that access to SADIS requires a user name and password)

WIFS <http://aviationweather.gov/wifs/> (note that access to WIFS requires a user name and password)

## 9. COMMUNICATIONS

The free text of all exercise messages starts with: VA EXERCISE VOLKAM19 and ends with:

EXERCISE EXERCISE EXERCISE (the ending is conditional on number of characters available)

Telcons start with:

EXERCISE VOLKAM19

Email message title should indicate:

EXERCISE VOLKAM19

## 10. DIRECTING STAFF

Role	Name	Agency	Email
Exercise Leader & ATMC leader	Alexey Buevich	State ATM Corporation of Russia	<a href="mailto:alexey@matfmc.ru">alexey@matfmc.ru</a>
National Supervisory Authorities	Elena Glukhovskaya	FATA	<a href="mailto:Gluhovskaya_ep@scaa.ru">Gluhovskaya_ep@scaa.ru</a>
	Tomoyuki Takei	JCAB	<a href="mailto:Takei-t469n@mlit.go.jp">Takei-t469n@mlit.go.jp</a>
Lead VAAC	Yuichi Imamura	JMA, VAAC Tokyo	<a href="mailto:y_imamura@met.kishou.go.jp">y_imamura@met.kishou.go.jp</a>
Lead VO	Olga Girina	KVERT, IVS FEB RAS	<a href="mailto:girina@kscnet.ru">girina@kscnet.ru</a>
Lead ACC	Petr Tsyarkin	Magadan ACC	<a href="mailto:acc@sv.gkovd.ru">acc@sv.gkovd.ru</a>
Lead ACC	Vladimir Fedulov	Petropavlovsk Kamchatsky ACC	<a href="mailto:VAF@kam.gkovd.ru">VAF@kam.gkovd.ru</a>
Lead ACC	Roman Tkachenko	Khabarovsk ACC	<a href="mailto:psnesarev@dv.gkovd.ru">psnesarev@dv.gkovd.ru</a>
Lead NOF	Galena Kotova	NOF Moscow	<a href="mailto:kotova@caica.ru">kotova@caica.ru</a>
Lead Roshydromet	Yuliya Naryshkina	Roshydromet	<a href="mailto:juliaavia@mail.ru">juliaavia@mail.ru</a>
Lead MWO	Irina Veretennikova	Yelizovo MWO	<a href="mailto:arrow.ir@mail.ru">arrow.ir@mail.ru</a>
Airlines	Dmitry Kosolapov	IATA – Russian Feder	<a href="mailto:kosolapoval@iata.org">kosolapoval@iata.org</a>

## 11. VOLCANIC ASH TELECONFERENCE INSTRUCTIONS

**Lead:** The lead of teleconference calls should be the ATMC of the State where the volcano is erupting (e.g. a volcano eruption in Kamchatka – MATMC Moscow; volcano eruption in Japan – Fukuoka ATMC; volcano eruption in Alaska – US ATCSCC)

**Expected participants** and general information expected from each:

**VO** – brief update on eruption status, latest height information, source of height information; duration of event, expected activity (only available in first five minutes)

**VAAC** – brief update on VAA/VAG (are observations such as aircraft reports being used to update products) (only available in first five minutes)

**MWO** – brief update on SIGMET (if different from VAA/VAG, briefly explain why)

**NOF** – brief update on NOTAM and published reroutes

**ACC** – brief update on reroutes and coordination with ACCs and ATMCs

**ATMC** – brief update on overall strategy (coordination with other ATMCs and ACCs)

**Airlines** – brief update on tactical reroutes, flight plan changes and satisfaction with reroutes

**ATMC** – response, if necessary, to airlines

**ACC** – response, if necessary, to ATMCs and airlines

**Information sharing:** With reference to information sharing, a web portal (like that at Eurocontrol) is not yet available; however, links provided in the other notes section allows the user to access VAA/VAG from VAACs, VONA from VOs, special air-reports on volcanic ash and relevant SIGMETs and NOTAMs on SADIS and WIFS.

In the future, a web portal may be considered useful to obtain volcanic ash related products and information.

**Language:** Each State should arrange to have participants speak English during the teleconferences.

### **VOLKAM19:**

Dial: **+44 (0) 3306 068934**

Conference code: **2658424794** (followed by #)

All participants will be muted in the beginning of the teleconference by the Leader.

The Leader will ask individual participants to speak by unmuting their own line by dialing **#6**. After that individual has spoken, they need to mute their own line by dialing again **\*6**.

Userguide: [http://www.intercalleeurope.com/files/ResPlusUserGuide\\_eng.pdf](http://www.intercalleeurope.com/files/ResPlusUserGuide_eng.pdf)



Email list for VOLKAM19 (place EXERCISE VOLKAM19 in email title):

[girina@kscnet.ru](mailto:girina@kscnet.ru); [y\\_imamura@met.kishou.go.jp](mailto:y_imamura@met.kishou.go.jp); [vaac.tokyo@volash.kishou.go.jp](mailto:vaac.tokyo@volash.kishou.go.jp);  
[jeffrey.osiensky@noaa.gov](mailto:jeffrey.osiensky@noaa.gov); [a-vaac@noaa.gov](mailto:a-vaac@noaa.gov); [Jamie.Kibler@noaa.gov](mailto:Jamie.Kibler@noaa.gov); [w-vaac@noaa.gov](mailto:w-vaac@noaa.gov);  
[biljana.bekcic@canada.ca](mailto:biljana.bekcic@canada.ca); [dov.bensimon@canada.ca](mailto:dov.bensimon@canada.ca); [vaac@ec.gc.ca](mailto:vaac@ec.gc.ca); [h@met.kishou.go.jp](mailto:fujimoto-<br/>h@met.kishou.go.jp); [alexey@matfmc.ru](mailto:alexey@matfmc.ru); [takei-t469n@mlit.go.jp](mailto:takei-t469n@mlit.go.jp); [9-ATOR-HQ-ATCSCC-  
AT-NOM@faa.gov](mailto:9-ATOR-HQ-ATCSCC-<br/>AT-NOM@faa.gov); [talon.j.medema@faa.gov](mailto:talon.j.medema@faa.gov); [hayashi-y07j9@mlit.go.jp](mailto:hayashi-y07j9@mlit.go.jp); [sakurai-  
a07xr@mlit.go.jp](mailto:sakurai-<br/>a07xr@mlit.go.jp); [aoto-h074i@mlit.go.jp](mailto:aoto-h074i@mlit.go.jp); [ishida-m078q@mlit.go.jp](mailto:ishida-m078q@mlit.go.jp);  
[psnesarev@dv.gkovd.ru](mailto:psnesarev@dv.gkovd.ru); [acc@sv.gkovd.ru](mailto:acc@sv.gkovd.ru); [john.j.taggart@faa.gov](mailto:john.j.taggart@faa.gov);  
[Dustin.M.Byerly@faa.gov](mailto:Dustin.M.Byerly@faa.gov); [zoa.all.hands@noaa.gov](mailto:zoa.all.hands@noaa.gov); [sbutakov@kamaero.ru](mailto:sbutakov@kamaero.ru);  
[horndb@navcanada.ca](mailto:horndb@navcanada.ca); [Anik.Bertrand@navcanada.ca](mailto:Anik.Bertrand@navcanada.ca); [DanseGr@navcanada.ca](mailto:DanseGr@navcanada.ca);  
[Dawn.Whyte@navcanada.ca](mailto:Dawn.Whyte@navcanada.ca); [Gluhovskaya\\_ep@scaa.ru](mailto:Gluhovskaya_ep@scaa.ru); [juliaavia@mail.ru](mailto:juliaavia@mail.ru); [svirin@caica.ru](mailto:svirin@caica.ru);  
[sakamoto-t41zd@mlit.go.jp](mailto:sakamoto-t41zd@mlit.go.jp); [shiomih46jp@mlit.go.jp](mailto:shiomih46jp@mlit.go.jp); [michael.murphy@faa.gov](mailto:michael.murphy@faa.gov);  
[mochiduki-k4634@mlit.go.jp](mailto:mochiduki-k4634@mlit.go.jp); [Jerry.Torres@faa.gov](mailto:Jerry.Torres@faa.gov); [arrow.ir@mail.ru](mailto:arrow.ir@mail.ru);  
[meteo\\_sokol@mail.ru](mailto:meteo_sokol@mail.ru); [nws.ar.cwsu@noaa.gov](mailto:nws.ar.cwsu@noaa.gov); [Carrie.Haisley@noaa.gov](mailto:Carrie.Haisley@noaa.gov);  
[arestov@matfmc.ru](mailto:arestov@matfmc.ru); [kosolapovd@iata.org](mailto:kosolapovd@iata.org); [gene.cameron@united.com](mailto:gene.cameron@united.com);  
[gen.schnee@united.com](mailto:gen.schnee@united.com); [mike.stills@united.com](mailto:mike.stills@united.com); [migitaka.nxf7@jal.com](mailto:migitaka.nxf7@jal.com);  
[kurosawa.wnb3@jal.com](mailto:kurosawa.wnb3@jal.com); [t.kudo@ana.co.jp](mailto:t.kudo@ana.co.jp); [y.hamaguchi@ana.co.jp](mailto:y.hamaguchi@ana.co.jp);  
[allan\\_tang@cathaypacific.com](mailto:allan_tang@cathaypacific.com); [julian\\_fung@cathaypacific.com](mailto:julian_fung@cathaypacific.com);  
[kelvin\\_poon@cathaypacific.com](mailto:kelvin_poon@cathaypacific.com); [kei\\_hon\\_liu@cathaypacific.com](mailto:kei_hon_liu@cathaypacific.com);  
[wy\\_lau@cathaypacific.com](mailto>wy_lau@cathaypacific.com); [kffoster@ups.com](mailto:kffoster@ups.com); [ATL019.SASINT@delta.com](mailto:ATL019.SASINT@delta.com);  
[Junichiro.asano@delta.com](mailto:Junichiro.asano@delta.com); [greg.ginrich@delta.com](mailto:greg.ginrich@delta.com); [Stephen.smith@aa.com](mailto:Stephen.smith@aa.com);  
[Tobin.Miller@aa.com](mailto:Tobin.Miller@aa.com); [michael.P.collier@aa.com](mailto:michael.P.collier@aa.com); [Steve.Abelman@aa.com](mailto:Steve.Abelman@aa.com);  
[joseph.marney@aa.com](mailto:joseph.marney@aa.com); [lanwang@evaair.com](mailto:lanwang@evaair.com); [chunyulin@evaair.com](mailto:chunyulin@evaair.com);  
[elizabeth.krajewski@weather.com](mailto:elizabeth.krajewski@weather.com); [btimothy@us.ibm.com](mailto:btimothy@us.ibm.com); [ckeohan@paris.icao.int](mailto:ckeohan@paris.icao.int);  
[murayama-h05c3@mlit.go.jp](mailto:murayama-h05c3@mlit.go.jp); [lalandd@navcanada.ca](mailto:lalandd@navcanada.ca); [nsavvina@paris.icao.int](mailto:nsavvina@paris.icao.int);

## Glossary of Acronyms

ACARS – Aircraft Communications Addressing and Reporting System

ACC – Area Control Centre

AIREP SPECIAL – special air-reports

AIS – Aeronautical Information Services

ANA – All Nippon Airways

ANSP – Air Navigation Service Provider

ATCSCC – Air Traffic Control System Command Center

ARTCC – Air Route Traffic Control Center

ATFM – Air Traffic Flow Management

ATM – Air Traffic Management

ATMC – Air Traffic Management Centre

AVO – Alaska Volcano Observatory

CPWG – Cross Polar Working Group

FPL – Flight Plan

IATA – International Air Transport Association

ICAO RO – International Civil Aviation Organisation Regional Officer

JAL – Japan Airlines

KVERT – Kamchatka Volcanic Eruption Response Team

MATMC – Main Air Traffic Management Center (of State ATM Corporation of Russia)

MWO – Meteorological Watch Office

NOAA – National Oceanic and Atmospheric Administration (of the United States)

NOF – International NOTAM Office

NOPAC – North Pacific (referencing air-routes)

PACOTS – Pacific Organised Track System (referencing air-routes)

ROC – Regional OPMET Centre

RODB – Regional OPMET Data Bank

SADIS – Satellite Distribution System

UPS – United Parcel Service

VAA – Volcanic Ash Advisory

VAAC – Volcanic Ash Advisory Centre

VAG – Volcanic ash advisory information in graphical format

VO – Volcano Observatory

VOLKAM19 – name of volcano exercise in far Eastern EUR in 2019

VONA – Volcano Observatory Notice for Aviation

WIFS – World Area Forecast System (WAFS) Internet File Service (WIFS)

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