

## EXERCISE DIRECTIVE

### AFI VOLCANIC ASH EXERCISE

# AFI VOLCEX 21/01



**Official name of the volcano:** Vulcão do Fogo

**Location:** Lat: 14° 56'N; Long: 24° 20' W

**Volcano number:** 384010

**The highest elevation:** 2829 m

**Area:** Cabo Verde Island

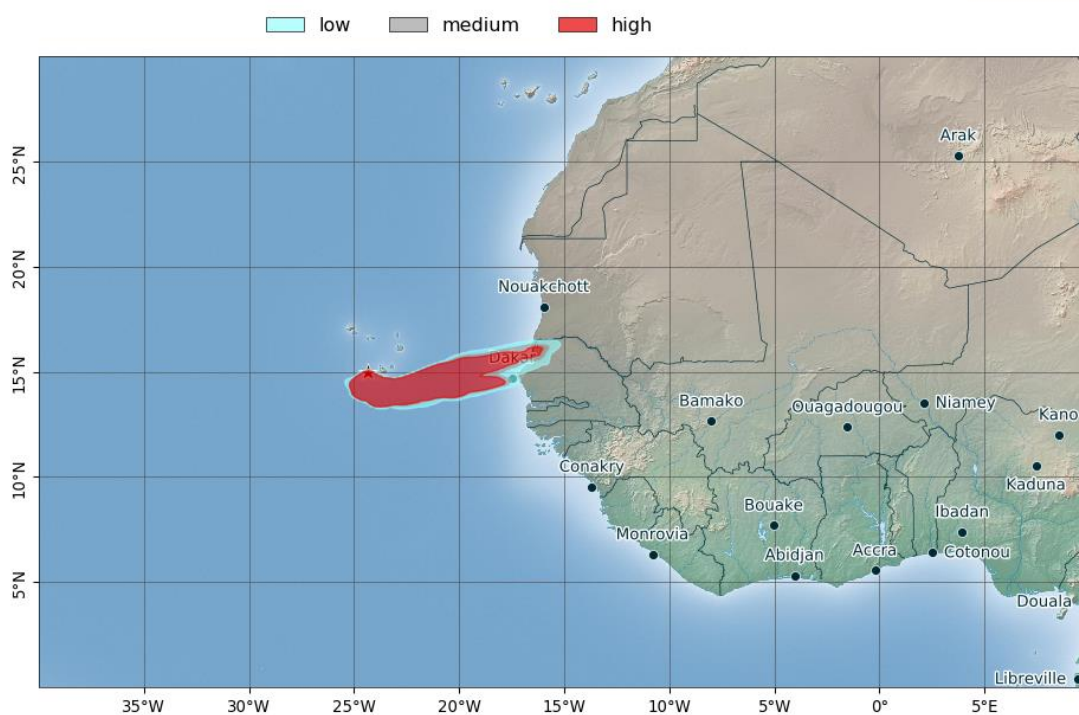
Volcanic Ash Impact Projection

**exercice\_AFI - ash concentration from FL200 to FL350**

valid at 2021/11/30 09:00 UTC

**EXERCISE !!! EXERCISE !!! EXERCISE !!!**

This is a guidance product, supplemental to the official VAAC Toulouse Volcanic Ash Advisory and Volcanic Ash Graphic products.  
All concentrations are subject to a level of uncertainty relative to errors in the estimation of the eruption strength.



Vulcão do Fogo: 14° 56' N; 24° 20' W

## ***AFI VOLCEX 2021/01 Directives***

### **1. INTRODUCTION**

- 1.1. A simulated eruption of a volcano in Cabo Verde called Vulcão do Fogo will produce volcanic ash up to FL410 where it will be transported by W wind of 89Kt in order to impact the EUR/SAM Corridor and Eastbound routes (UR976, UA601), and N wind of 125 Km/hr in order to impact continental routes (UB 623, UW 31, UW 32, UN 857, UA 602, UA 601, UA 302, UG 853, UN 976, UM 974, UR 620).
- 1.2. The objectives to be tested are provided in section 4 of this report.
- 1.3. 1.2. The Exercise Leader will be Mr. Alberto Silva, Head of the Cabo Verde's CAA Air Navigation Services Department. The duties of the Exercise Leader are specified in the AFI VOLCEX Operational Instructions (OPINS). There will be no operational impact in this exercise (dedicated staff is expected to be available for the test).
- 1.4. 1.3. The AFI volcanic ash contingency plan (AFI VCAP) will be the contingency plan to be tested in this exercise.
- 1.5. Exercise date and time (UTC): 30 November, 09:30 UTC to 12:30 UTC.

**Note:** *If one or more participants consider it difficult to continue this exercise due to severe events such as volcanic eruption or low pressure, they may advise the Exercise Leader to cancel the exercise. In response, the Exercise Leader will announce the cancellation where appropriate.*

- 1.6. A dedicated webpage for the exercise is available at <http://www.icao.int/WACAF/Pages/volcanic-ash.aspx>
- 1.7. The VAAC products (VAA/VAG and concentration charts) will be available on the Toulouse VAAC public Web portal: <http://vaac.meteo.fr/>

## ***AFI VOLCEX 2021/01 Directives***

### **2. LIST OF ABBREVIATIONS**

**ACC** - Area Control Centre

**AIM** - ATFCM Information Message

**AIS** - Aeronautical Information Service

**AO** - Aircraft Operator

**AOC** - Airline Operator Centre

**ANSP** - Air Navigation Service Provider

**ATFCM** - Air Traffic Flow and Capacity Management

**ASHTAM** - Special series NOTAM notifying, by means of a specific format, change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations

**ATM** - Air Traffic Management

**ATS** - Air Traffic Services

**CFMU** - Central Flow Management Unit

**CTR** - Control Zone

**FMP** - Flow Management Unit

**IFPS** - Integrated Initial Flight Plan Processing System

**IFPZ** - IFPS Zone

**MWO** - Meteorological Watch Office

**NOF** - International NOTAM Office

**NOTAM** - A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations

**SIGMET** - Information concerning en-route weather phenomena which may affect the safety of aircraft operations

**VA** - Volcanic Ash

**VAA** - Volcanic Ash Advisory

**VAAC** - Volcanic Ash Advisory Centre

**VAG** - Volcanic Ash Graphic

**VONA** - Volcano Observatory Notice for Aviation

**AFI VOLCEX 2021/01 Directives**

**3. PARTICIPATING AGENCIES**

Agency	Country	Contact name	Contact position	Primary telephone number	Secondary telephone number	e-mails address
Volcano Observatory	Cabo Verde	Bruno Faria	Director Geophysics INMG	+2382326622 +2385972392	...	<a href="mailto:brunofaria@sapo.cv">brunofaria@sapo.cv</a>
VAAC Toulouse	France	Philippe Héreil Thomas Marmigere	Met Services for Aviation Operations Head VAAC Toulouse	80+33561078 096 exercise room;	+33 561 07 82 30	<a href="mailto:Thomas.marmigere@meteo.fr">Thomas.marmigere@meteo.fr</a> <a href="mailto:philippe.hereil@meteo.fr">philippe.hereil@meteo.fr</a>
ATMC	Cabo Verde	Margarett Graça	Head ATS ASA	+2389927514		Margarett.marques@asa.cv
ACC	Cabo Verde	Adilson Vaz	Head ACC ASA	+2389810844		adilson.vaz@asa.cv
FIC	Cabo Verde	Margarett Graça	Head ATS ASA	+2389927514		Margarett.marques@asa.cv
Regulatory	Cabo Verde	Alberto Silva	Head ANS AAC	+2389718255	+238 2603430	Alberto.silva@aac.cv
	Cabo Verde	Micael Moreno	ANS Inspector	+2389957222		micael.moreno@aac.cv
MWO	Cabo Verde	Suely Gonçalves	Director MET INMG	+2389500862	+238 5931275	su_ely21@hotmail.com
NOF	Cabo Verde	Aristides Martins	Head of AIS ASA	+2389915602		csgia@asa.cv
APIRG IIM/SG	Senegal	Niokhor	ANACIM	+221		niokhor.diouf@anacim.sn

**AFI VOLCEX 2021/01 Directives**

Agency	Country	Contact name	Contact position	Primary telephone number	Secondary telephone number	e-mails address
MET Project 2		diouf		777677286		
BNI/DKR	Senegal	GUEYE Amadou	ASECNA	+2217756177 84		GUEYEAm2@asecna.org
ACC	Senegal	Mamour Diouf	ASECNA	+2217723159 20		DIOUFMam1@asecna.org
MWO	Senegal	Wane Sokhna Yaya	ASECNA	+221 76 388 60 69		WANESok@asecna.org
IATA	-	Robert Oberstar	IATA			robert.oberstar@delta.com
Emirates	-	Kaspars Vitols	Coordinator of European volcanic ash exercises for Emirates			kaspars.vitols@emirates.com
Airlines	Senegal	El Hadj FAYE	Air Senegal			elhadji.faye@groupeetransair.sn
Airlines		Djibril SEIBOU				djibril.seibou@airsenegalsa.sn
ANSP	ASECNA	MOUSTAPH A Hamidi	ASECNA/DNA	00 221 78 638 12 42		MOUSTAPHAHam@asecna.org
ANSP	ASECNA	Halarou Djibo	ASECNA/DNA	+2217816421 88		DJIBOHal@asecna.org
International and inter-regional coordination	ICAO ESAF Office		Chinga Mazhetese	+2547118046 78	+254 207622396	<a href="mailto:cmazhetese@icao.int">cmazhetese@icao.int</a>
			Ogutu Keziah	+2547273662 93		<a href="mailto:KOgutu@icao.int">KOgutu@icao.int</a>
			Lekamisy Harvey Gabriel	+254 707622370		<a href="mailto:hlekamisy@icao.int">hlekamisy@icao.int</a>

## ***AFI VOLCEX 2021/01 Directives***

Agency	Country	Contact name	Contact position	Primary telephone number	Secondary telephone number	e-mails address
	ICAO WACAF Office	Albert Aidoo TAYLOR		+221 77 614 11 16		<a href="mailto:Ataylor@icao.int">Ataylor@icao.int</a>
		Fanfé Bamba		+221 77 319 92 86		<a href="mailto:FBamba@icao.int">FBamba@icao.int</a>
		François Xavier Salambanga		+221 76 688 28 07		<a href="mailto:FSalambanga@icao.int">FSalambanga@icao.int</a>
		Goama Ilboudo		+221 776112699		<a href="mailto:Gilboudo@icao.int">Gilboudo@icao.int</a>

### **4. AIMS AND OBJECTIVES**

4.1. Within the framework of this first volcanic ash exercise in the AFI region, the objectives are focused on technical matters (flow of information – VONA from the volcano observatory – VAA/VAG from the VAAC – issuance of SIGMET from the MWO – issuance of NOTAM from AIS etc.) as follows:

- OB-1. Demonstrate coordination procedures between all participating parties (ANSPs, ATM Centres, AIS, VO, VAACs, MWOs, Users)
  
- OB-2. Verify existing information and messages routing between all involved agencies and organizations.
  
- OB-3. Demonstrate transmission of air-reports on volcanic ash in accordance to Annex 3 (Aircraft ->ACC ->MWO ->VAAC)
  
- OB-4. Demonstrate information sharing via teleconferences and website
  
- OB-5. Provide recommendations for amendment of the procedures, in accordance with the lessons learned and conclusions formulated.

### **5. EXERCISE DURATION**

5.1 The exercise will be conducted on 30 November. It will take 3 hours commencing at 09:30 UTC

## ***AFI VOLCEX 2021/01 Directives***

### **6. EXERCISE SCENARIO**

6.1. Simulated eruption with volcanic ash cloud up to FL410 moving East at 165 km/hr to impact ATS routes and airspace within SAL FIR (GVSC) and DAKAR FIR (GOOO).

### **7. REFERENCE MATERIAL**

- ICAO Annex 3 – Meteorological Service for International Air Navigation
- ICAO Annex 11 – Air Traffic Services
- ICAO Annex 15 – Aeronautical Information Services
- ICAO Doc 4444-ATM/501 – Procedures for Air Navigation Services
- ICAO Doc 9691-AN/954 – Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds
- ICAO Doc 9766-AN/968 – Handbook on the International Airways Volcano Watch
- AFI – Volcanic Ash Contingency Plan

### **8. EXERCISE SCHEDULE**

<b>03 March 2021</b>		
<b>Players</b>	<b>Event /Action</b>	<b>Resp.</b>
ICAO ESAF and WACAF Offices and APIRG IIM MET Project 2 Members	First coordination meeting on the AFI volcanic ash exercise	ICAO ESAF and WACAF Offices

<b>06 to 08 April 2021</b>		
<b>Players</b>	<b>Event /Action</b>	<b>Resp.</b>
Open to all stakeholders, including ANSPs, MWOs, NOFs, AOs and National Regulators	Preparatory exercise workshop	ICAO ESAF and WACAF Offices



**AFI VOLCEX 2021/01 Directives**

12 April 2021		
Players	Event /Action	Resp.
ICAO ESAF and WACAF Offices – APIRG IIM MET Project 2 PTC	Designation of the AFI VOLCEX 21/01 Leader	ICAO ESAF and WACAF Office

03 May – 30 June 2021		
Players	Event /Action	Resp.
Exercise leader, ICAO Secretariat & DISTAFF	Development of the draft VOLCEX 21/01 Directives	Exercise Leader

October 30 (1 month before exercise)		
Players	Event /Action	Resp.
Exercise leader	Send the final version of the exercise directive for publication by ICAO	Cabo Verde

November 22		Resp.
Players	Event /Action	
DGCA Cabo Verde, Regional Directors and Deputy Regional Directors of ICAO ESAF and WACAF	Presentation of the final version of the AFI Volcanic Exercise Directive	Exercise Leader & ICAO ESAF and WACAF Offices

**AFI VOLCEX 2021/01 Directives**

Offices, APIRG IIM MET Project 2 PTC, ICAO concerned Regional Officers Exercise Leader and local Team Members		
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November 23 (1 week before exercise)		Resp.
Players	Event /Action	
NOF	<a href="#">Issue preparatory NOTAMs to inform the aviation community of the exercise</a>	Cabo Verde

November 24		Resp.
Players	Event /Action	
Exercise Leader, ICAO ESAF and WACAF Offices, all stakeholders, DStaff, Participating Agencies	Pre-Exercise Meeting	

November 27		Resp.
Players	Event /Action	
NOFs	Issues a general AIM to inform the aviation community of the exercise	Exercise Leader /IIM MET Project 2

**AFI VOLCEX 2021/01 Directives**

November 28		Resp.
Players	Event /Action	
ACCs	Issue to their NOFs a request NOTAM message to inform the aviation community of the exercise based on the AIM issued by Cabo Verde	Exercise Leader /IIM MET Project 2

November 29		Resp.
Players	Event /Action	
NOFs	Issue consequential NOTAMs to inform the aviation community of the exercise based on the AIM issued by NM	Exercise Leader /IIM MET Project 2

November 30			
Date /Time (UTC)	Players	Event /Action	Resp.
09:00	Moderator	Opening Ceremony (CV CAA, ICAO, Exercise leader)	
09:30	Exercise leader	Exercise leader announce the commencement of the exercise START EXERCISE VOLCEX21 Activities	Exercise Leader

**AFI VOLCEX 2021/01 Directives**



		<a href="#">Fogo volcano eruption movie</a> <a href="#">Volcano location</a> Lat: $14^{\circ} 56' N$ ; Long: $24^{\circ} 20' W$	
09:35	VO - INMG	<a href="#">Issue 1<sup>st</sup> VONA (initial eruption details)</a> Phone call and e-mail to Sal ACC and Toulouse VAAC warning about eruption and giving first known data. Also available on <a href="http://vaac.meteo.fr/">http://vaac.meteo.fr/</a> – (29 NOV)	Cabo Verde
09:40	VAAC Toulouse	<a href="#">Issue 1<sup>st</sup> exercise VAA[/VAG] based on VONA</a> Messages\VAA 1.docx and information by satellite and start running Dispersal Models – (29 NOV)	France
09:45	MWO	<a href="#">Issue 1<sup>st</sup> exercise SIGMET</a> based on VAA for respective areas – (29 NOV)	Cabo Verde
09:50	NOF	<a href="#">Issue 1<sup>st</sup> exercise NOTAM</a> based on SIGMET – (29 NOV)	Cabo Verde
09:55	ACC	Apply ATC measures based on SIGMET and NOTAM (Apply re-route) – (29 NOV)	Cabo Verde
10:00	AO	Report aircraft observation [volcanic ash/no volcanic ash] as special air-report by Air Senegal Airlines to Sal ACC – (29 NOV)	Airlines
10:05	ACC	Relay and record special air-report from Air Senegal Airlines to all aircrafts in the routes affects by volcanic ash cloud – (29 NOV)	Cabo Verde

## AFI VOLCEX 2021/01 Directives

### exercice\_AFI - ash concentration from SFC to FL200

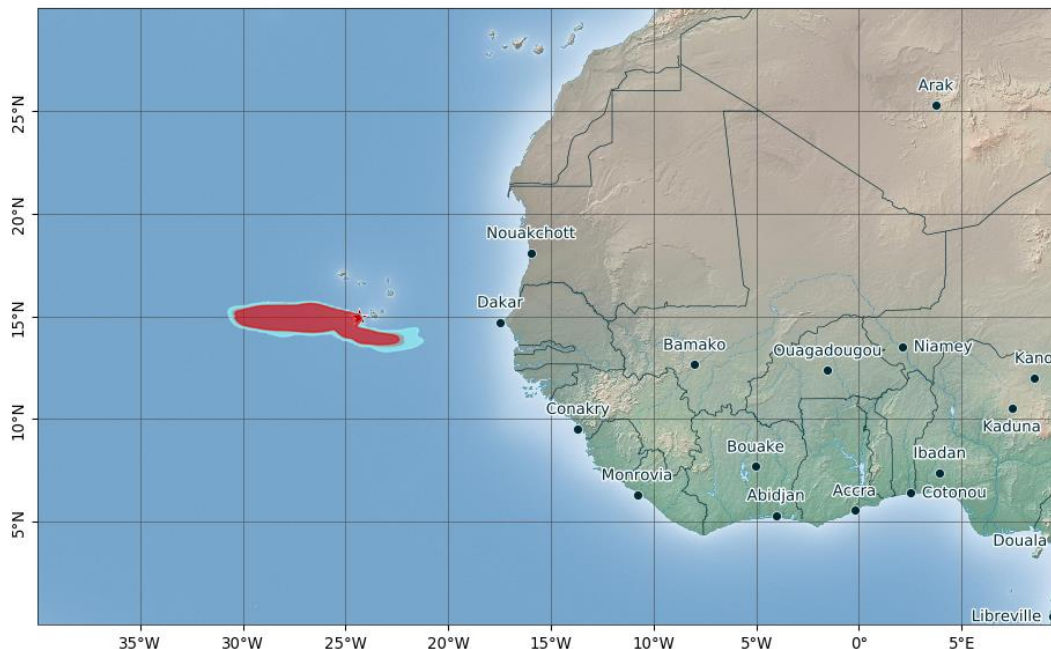
valid at 2021/11/30 09:00 UTC

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All concentrations are subject to a level of uncertainty relative to errors in the estimation of the eruption strength.



low medium high



10:10	VAAC Toulouse	<a href="#">Issue 2<sup>nd</sup> exercise VAA/VAG</a> based on concentration Charts valid from 30/0900 to 01/0300; provides ash concentration data to Cabo Verde VO and MWO. Available on <a href="http://vaac.meteo.fr/">http://vaac.meteo.fr/</a>	France
10:15	MWO	<a href="#">Issue 2<sup>nd</sup> exercise SIGMET based on VAA/VAG</a> Issue updated SIGMETs for respective areas	Cabo Verde
10:20	NOF	<a href="#">Issue 2<sup>nd</sup> exercise NOTAM consistence with the SIGMET</a>	Cabo Verde
10:25	ACC	Apply ATC measures based on SIGMET and NOTAM (Apply re-route)	Cabo Verde
10:30	AO	Report aircraft observation [volcanic ash/no volcanic ash] as special air-report by Air Senegal Airlines to Sal ACC	Airlines
10:35	ACC	Relay and record special air-report from Air Senegal Airlines to all aircrafts in the routes affects by volcanic ash cloud	Cabo Verde

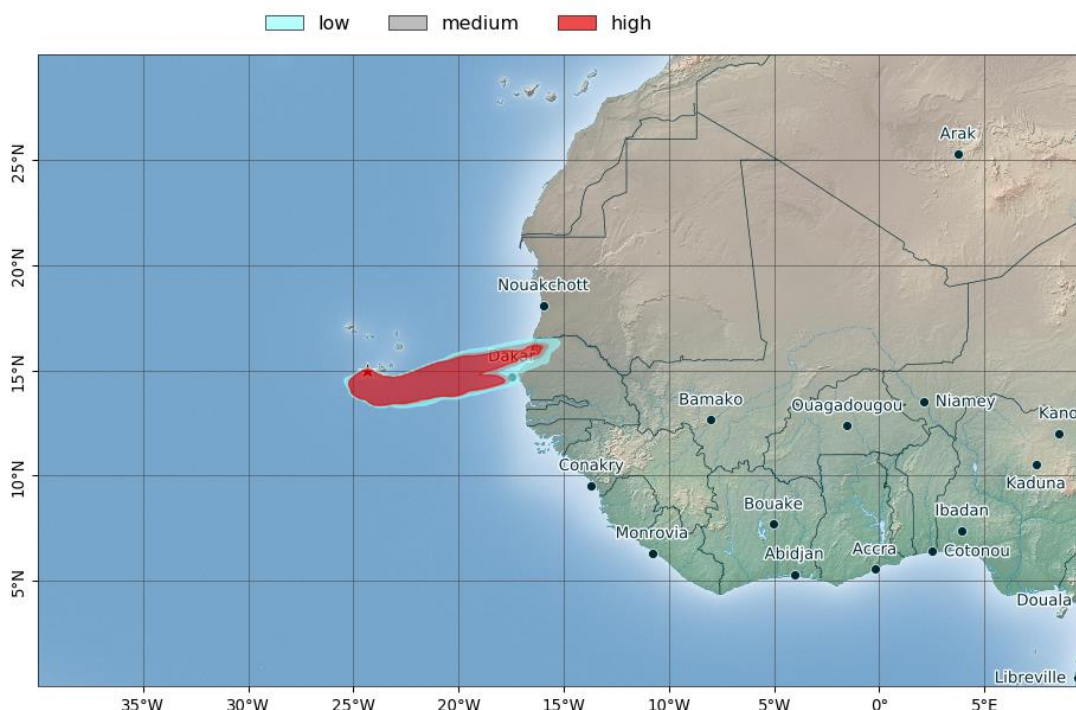
## AFI VOLCEX 2021/01 Directives

### exercice\_AFI - ash concentration from FL200 to FL350

valid at 2021/11/30 09:00 UTC

**EXERCISE !!! EXERCISE !!! EXERCISE !!!**

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All concentrations are subject to a level of uncertainty relative to errors in the estimation of the eruption strength.



10:40	VAAC Toulouse	<a href="#">Issue 3<sup>rd</sup> exercise VAA/VAG based on</a> concentration Charts valid from 30/0900 to 01/0300; provides ash concentration data to Senegal VO and MWO. Available on <a href="http://vaac.meteo.fr/">http://vaac.meteo.fr/</a>	France
10:45	Leader	Invites Senegal to present in web conference	Cabo Verde
10:50	MWO	Issue 3 <sup>rd</sup> exercise SIGMET based on VAA/VAG for respective areas	Senegal
10:55	NOF	Issue 3 <sup>rd</sup> exercise NOTAM based on SIGMET	Senegal
11:00	ACC	Apply ATC measures based on SIGMET and NOTAM (Apply re-route)	Senegal
11:05	AO	Report aircraft observation [volcanic ash/no volcanic ash] as special air-report by Air Senegal Airlines to Dakar ACC	Airlines
11:10	ACC	Relay and record special air-report from Air Senegal Airlines to all aircrafts in the routes affects by volcanic ash cloud	Senegal
11:15	VAAC Toulouse	<a href="#">Issue 4<sup>th</sup> exercise VAA/VAG based on</a> concentration Charts valid from 30/1100 to 01/0500; provides ash concentration data to Cabo Verde and Senegal VO and MWO. Available on <a href="http://vaac.meteo.fr/">http://vaac.meteo.fr/</a>	France
11:20	MWO	<a href="#">Issue 4<sup>th</sup> exercise SIGMET based on VAA/VAG</a> for respective areas	Cabo Verde
11:25	NOF	<a href="#">Issue 4<sup>th</sup> exercise NOTAM consistence with the SIGMET</a>	Cabo Verde

### ***AFI VOLCEX 2021/01 Directives***

11:30	ACC	Apply ATC measures based on SIGMET and NOTAM (Apply re-route)	Cabo Verde
11:35	AO	Report aircraft observation [volcanic ash/no volcanic ash] as special air-report by Air Senegal Airlines to Sal ACC	Airlines
11:40	ACC	Relay and record special air-report from Air Senegal Airlines to all aircrafts in the routes affects by volcanic ash cloud	Cabo Verde
11:45	MWO	Issue 5 <sup>th</sup> exercise SIGMET based on VAA/VAG_ for respective areas	Senegal
11:50	NOF	Issue 5 <sup>th</sup> exercise NOTAM consistence with the SIGMET	Senegal
11:55	ACC	Apply ATC measures based on SIGMET (Apply re-route)	Senegal
12:00	AO	Report aircraft observation [volcanic ash/no volcanic and NOTAM ash] as special air-report by Air Senegal Airlines to Dakar ACC	Airlines
12:05	ACC	Relay and record special air-report from Air Senegal Airlines to all aircrafts in the routes affects by volcanic ash cloud	Senegal
12:10	VO - INMG	<a href="#">Cancel exercise VONA</a>	Cabo Verde
12:15	VAAC Toulouse	<a href="#">Cancel exercise VAA/VAG</a>	France
12:20	MWO	<a href="#">Cancel exercise SIGMET</a>	Cabo Verde
12:25	NOF	<a href="#">NOTAM Canceling Eruption</a> <a href="#">Cancel exercise NOTAM</a>	Cabo Verde
12:30	Exercise leader	Exercise leader announce cessation of the exercise and invite <a href="#">Kenya</a> to present in web conference	Cabo Verde
12:45	Exercise leader	Exercise Leader Invite <a href="#">South Africa</a> to present in web conference	Cabo Verde
13:00 13:30	Exercise leader and participants	Exercise web conference to discuss the exercise	All Participants

#### **9. INITIAL EXERCISE REPORT**

Directing Staff will complete the Initial Exercise Report on December 13<sup>th</sup>.

#### **10. EXERCISE DEBRIEF**

A Debrief Meeting will be on December 20<sup>th</sup>.

# AFI VOLCEX 2021/01 Directives

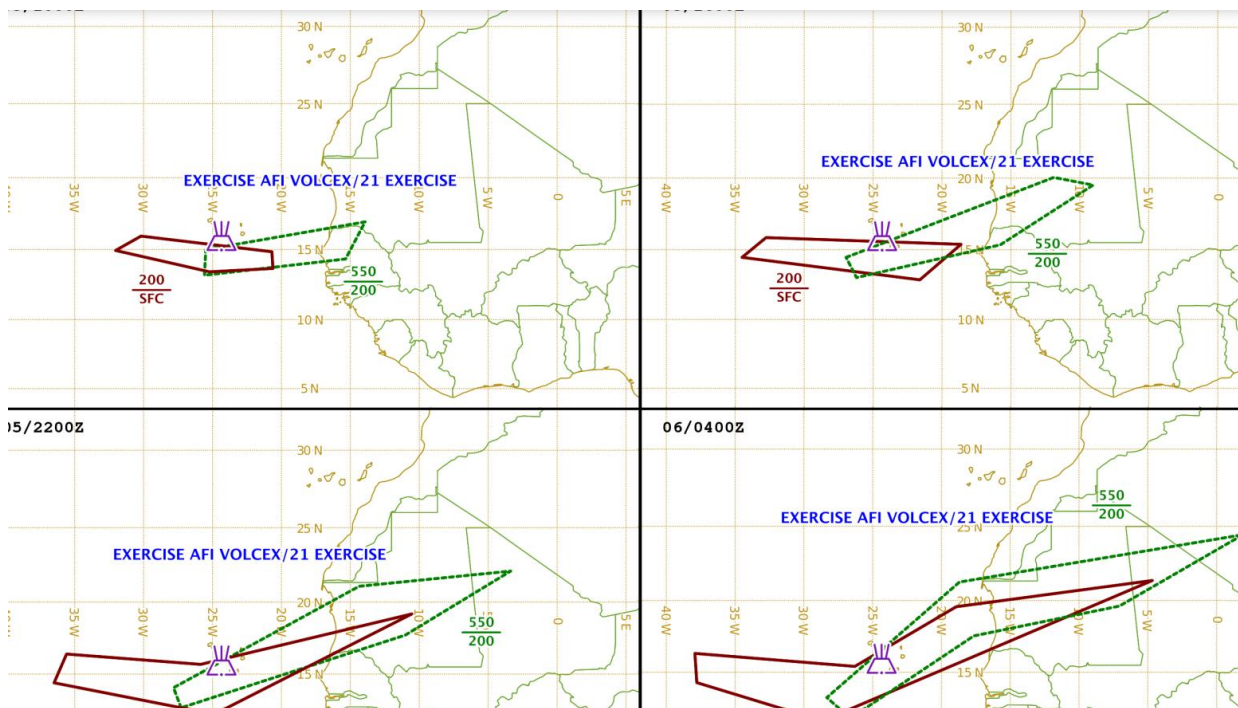
## 11. FINAL EXERCISE REPORT

The Exercise Leader is to consolidate the Initial Exercise Reports from the Directing Staff, as well as Debrief Meeting presentations and discussions, in order to prepare a Final Exercise Report.

The Final Exercise Report is to be available on 28<sup>th</sup> January 2022

## 12. EXERCISE SCENARIO MESSAGES

VAG





**AFI VOLCEX 2021/01 Directives**

SIGMET 1

OBS AT 0900Z

N1455 W02421 – N1457 W02420– N1457 W02421 – N1456 W2420



FCST 1000Z

N1456 W02417 - N1502 W02338 - N1509 W02306 - N1512 W02244



SIGMET 2

*AFI VOLCEX 2021/01 Directives*

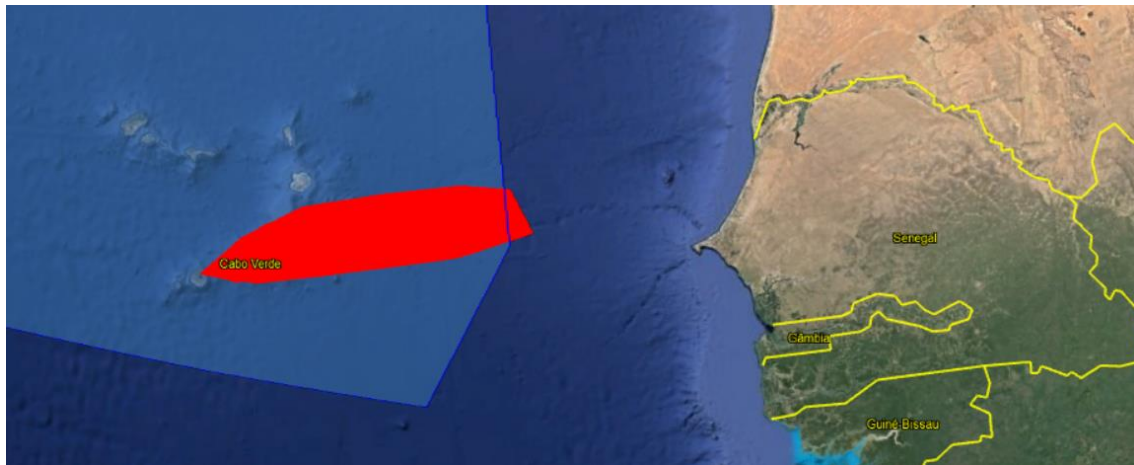
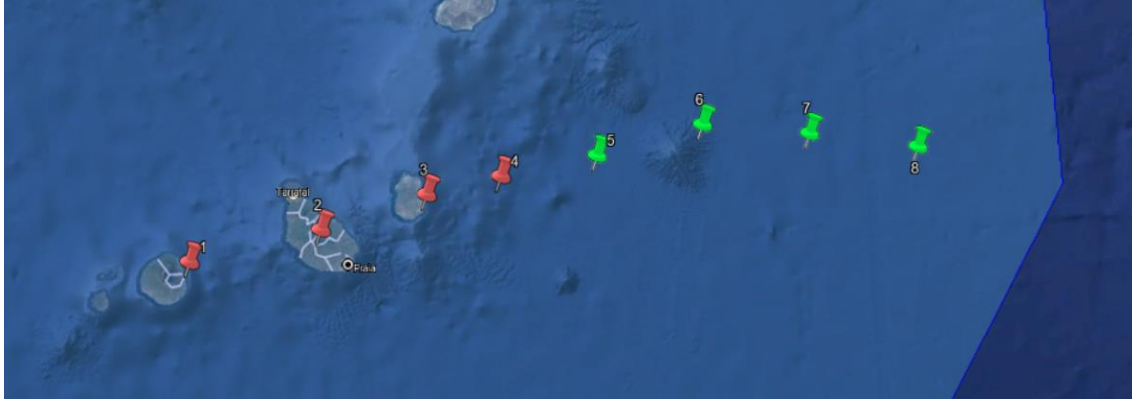
SIGMET 2

OBS AT 1000Z

N1456 W02417 - N1502 W02338 - N1509 W02306 - N1512 W02244

FCST AT 1500Z

N1515 W02216 - N1520 W2131 - N1517 W02049 - N1512 W01956



SIGMET 3

Issued by SENEGAL

*AFI VOLCEX 2021/01 Directives*



SIGMET 4

OBS AT 1100Z

N1515 W02216 - N1520 W2131 - N1517 W02049 - N1512 W01956

FCST AT 1630Z

N1512 W1909 – N1510 W1805 – N1510 W1658 – N1510 W1534



***AFI VOLCEX 2021/01 Directives***

**Day 23**

**Preparatory NOTAM (issued 1 week prior to exercise 23Nov21)**

(A0077/21 NOTAMN

Q) GVSC/QAFXX/IV/NBO/E/000/999/1830N02845W999

A) GVSC

B) 2111300930

C) 2111301230 EST

E) VA EXERCISE AFI VOLCEX 21/01

VOLCANIC ASH EXERCISE TAKES PLACE 30 NOVEMBER FROM 0930 TO APPROX 1230 UTC. EXERCISE NAME AFI VOLCEX 01/21. EXERCISE VOLCANO: MT VULCAO DO FOGO PSN 1456N 24 20W. FREE TEXT OF PROMULGATED EXERCISE MESSAGES START WITH: VA EXERCISE AFI VOLCEX 21/01. FREE TEXT OF EXERCISE MESSAGES END WITH: EXERCISE EXERCISE EXERCISE)

**Day 29**

**VONA 1**

**VONA**

*AFI VOLCEX 21/01*

(1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)

(2) Issued: 20211129/0935Z

(3) Volcano: VULCAO DO FOGO 384010

(4) Current Aviation Colour Code: RED

(5) Previous Aviation Colour Code: Green

(6) Source: INMG – VO

(7) Notice/Number: 2021/01

(8) Volcano Location: N1456 W02420

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(9) Area:	Cabo Verde
(10) Summit elevation:	9281 feet (2829 m)
(11) Volcanic Activity Summary:	Eruption in progress since 0800Z
(12) Volcanic Ash Height:	41000 feet (12.496.8m) AMSL, ground observer
(13) Other Volcanic Cloud Information:	Dark brown ash mushroom, moving toward E at 67KT, SO2 not seen
(14) Remarks:	
(15) Contacts:	INMG-DSV Tel +238 2326622 Fax +232 32402 Cell +238 9925838
(16) Next Notice:	20211129/1840 Z
EXERCISE EXERCISE EXERCISE	

**VAA 1**

VAA – VAAC Toulouse
 FOGO - 2021-11-29 0940 utc
VA ADVISORY
STATUS: EXER
DTG: 20211130/0940Z
VAAC: TOULOUSE
VOLCANO: FOGO 384010
PSN: N1456 W02420
AREA: CAPE VERDE ISLANDS
SUMMIT ELEV: 2829M
ADVISORY NR: 2021/1
INFO SOURCE: EXERCISE AFI VOLCEX21 EXERCISE
AVIATION COLOUR CODE: RED
ERUPTION DETAILS: ERUPTION AT 20211129/1900Z EXERCISE AFI VOLCEX21 EXERCISE
OBS VA DTG: 29/0900Z
OBS VA CLD: SFC/FL410 N1700 W02300 - N1445 W01815 - N1430 W01830 - N1500 W02430 - N1700 W02300 MOV NE 67KT FL300/410 N1500 W02430 - N1515 W02245 - N1500 W01830 - N1345 W01730 - N1500 W02430 MOV E 89KT

***AFI VOLCEX 2021/01 Directives***

FCST VA CLD +6 HR: 29/1500Z SFC/FL410 N1345 W02445 - N1630 W02415 - N1915 W01915  
- N1245 W01130 - N1045 W01130 - N1545 W02215 - N1345 W02445  
FCST VA CLD +12 HR: 29/2100Z SFC/FL410 NO VA EXP  
FCST VA CLD +18 HR: 01/0300Z NO VA EXP  
RMK: EXERCISE AFI VOLCEX21 EXERCISE PLEASE DISREGARD EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO LATER THAN 20211129/1200Z=

**SIGMET 1**

WVPH31 GVAC 290945  
GVSC SIGMET 1 VALID 290945/291345 GVAC-  
GVSC SAL FIR VA EXER VA ERUPTION MT VULCAO DO FOGO PSN N1456 W2420 VA CLD OBS  
AT 0900Z WI N1455 W02421 – N1457 W02420– N1457 W02421 – N1456 W2420 SFC/FL410  
FCST AT 1000Z WI N1456 W02417 - N1502 W02338  
– N1509 W02306 – N1512 W02244 – SFC

**NOTAM 1**

(A0078/21 NOTAMN  
Q) GVSC/QWWXX/IV/NBO/W/000/410/1456N02420W008  
A) GVSC  
B) 2111290950  
C) 2111300950 EST  
E) VA EXERCISE AFI VOLCEX 21/01.  
ERUPTION OF VOLCANO MT VULCAO DO FOGO ID 384010 SINCE 0800Z  
PSN N1456 W2420 ELEV 9281FT / 2829M  
VOLCANIC ASH REPORTED BY GROUND OBSERVER (HEIGHT 41000FT) MOVING EASTWARD AT 67KT. SO2  
NOT SEEN  
EXERCISE EXERCISE EXERCISE.  
F) SFC  
G) 41000FT AMSL)

**AFI VOLCEX 2021/01 Directives**

Day 30

**VAA 2**

VA ADVISORY  
STATUS: EXER  
DTG: 20211130/10100Z  
VAAC: TOULOUSE  
VOLCANO: FOGO 384010  
PSN: N1456 W02420  
AREA: CAPE VERDE ISLANDS  
SUMMIT ELEV: 2829M  
ADVISORY NR: 2021/2  
INFO SOURCE: EXERCISE AFI VOLCEX21 EXERCISE  
AVIATION COLOUR CODE: RED  
ERUPTION DETAILS: ERUPTION AT 20211129/1900Z EXERCISE AFI VOLCEX21 EXERCISE  
OBS VA DTG: 1010Z  
OBS VA CLD: SFC/FL410 N1700 W02300 - N1445 W01815 - N1430 W01830 - N1500 W02430 - N1700  
W02300 MOV NE 67KT FL300/410 N1500 W02430 - N1515 W02245 - N1500 W01830 - N1345 W01730 -  
N1500 W02430 MOV E 89KT  
FCST VA CLD +6 HR: 30/1500Z SFC/FL4100 N1345 W02445 - N1630 W02415 - N1915 W01915 - N1245  
W01130 - N1045 W01130 - N1545 W02215 - N1345 W02445  
FCST VA CLD +12 HR: 30/2100Z SFC/FL410 NO VA EXP  
FCST VA CLD +18 HR: 01/0300Z NO VA EXP  
RMK: EXERCISE AFI VOLCEX21 EXERCISE PLEASE DISREGARD EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO LATER THAN 20211130/1200Z=

**SIGMET 2**

WVPH31 GVAC 301015  
GVSC SIGMET 2 VALID 301015/301415 GVAC-  
GVSC SAL FIR VA EXER VA ERUPTION MT VULCAO DO FOGO PSN N1456 W02420 VA CLD OBS  
AT 1000Z N1456 WI N1502 W02338- N1509 W02306 - N1512 W02244 SFC/FL410 FCST 1500Z  
WI N1515 W02216 - N1521 W02146 -N1516 W02114- N1511 W02043 - SFC/FL410

*AFI VOLCEX 2021/01 Directives*

**NOTAM 2**

(A0079/21 NOTAMR A0078/21  
Q) GVSC/QWWXX/IV/NBO/W/000/410/1456N02420W 250  
A) GVSC  
B) 2111301020  
C) 2112011020 EST  
E) VA EXERCISE AFI VOLCEX 21/01.  
ERUPTION OF VOLCANO MT VULCAO DO FOGO ID 384010 SINCE 211129 0800Z  
PSN N1456 W2420 ELEV 9281FT / 2829M  
VOLCANIC ASH REPORTED UP TO 250 NM (HEIGHT 41000FT) MOVING EASTWARD AT 89KT. SO2 NOT SEEN  
EXERCISE EXERCISE EXERCISE.  
F) SFC  
G) 41000FT AMSL)

**VAA 3**

VAA 3– VAAC Toulouse  
FOGO - 2021-11-30 10:40 utc  
VA ADVISORY  
STATUS: EXER  
DTG: 20211130/10400Z  
VAAC: TOULOUSE  
VOLCANO: FOGO 384010  
PSN: N1456 W02421  
AREA: CAPE VERDE ISLANDS  
SUMMIT ELEV: 2829M  
ADVISORY NR: 2021/3  
INFO SOURCE: EXERCISE AFI VOLCEX21 EXERCISE  
AVIATION COLOUR CODE: RED  
ERUPTION DETAILS: ERUPTION AT 20211129/1900Z EXERCISE AFI VOLCEX21 EXERCISE  
OBS VA DTG: 1040Z



## ***AFI VOLCEX 2021/01 Directives***

OBS VA CLD: SFC/FL410 N1700 W02300 - N1445 W01815 - N1430 W01830 - N1500 W02430 - N1700  
W02300 MOV NE 20KT FL300/410 N1500 W02430 - N1515 W02245 - N1500 W01830 - N1345 W01730  
- N1500 W02430 MOV E 89KT  
FCST VA CLD +6 HR: 30/1500Z SFC/FL410 N1345 W02445 - N1630 W02415 - N1915 W01915 - N1245  
W01130 - N1045 W01130 - N1545 W02215 - N1345 W02445  
FCST VA CLD +12 HR: 30/2100Z SFC/FL410 NO VA EXP  
FCST VA CLD +18 HR: 01/0300Z NO VA EXP  
RMK: EXERCISE AFI VOLCEX21 EXERCISE PLEASE DISREGARD EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO LATER THAN 20211130/1200Z=

### **VAA 4**

VAA 4- VAAC Toulouse  
FOGO - 2021-11-30 11:15 utc

VA ADVISORY  
STATUS: EXER  
DTG: 20211130/11150Z  
VAAC: TOULOUSE  
VOLCANO: FOGO 384010  
PSN: N1456 W02421  
AREA: CAPE VERDE ISLANDS  
SUMMIT ELEV: 2829M  
ADVISORY NR: 2021/4  
INFO SOURCE: EXERCISE AFI VOLCEX21 EXERCISE  
AVIATION COLOUR CODE: RED  
ERUPTION DETAILS: ERUPTION AT 20211129/1900Z EXERCISE AFI VOLCEX21 EXERCISE  
OBS VA DTG: 1115Z  
OBS VA CLD: SFC/FL410 N1700 W02300 - N1445 W01815 - N1430 W01830 - N1500 W02430 - N1700  
W02300 MOV NE 20KT FL300/410 N1500 W02430 - N1515 W02245 - N1500 W01830 - N1345 W01730  
- N1500 W02430 MOV E 89KT  
FCST VA CLD +6 HR: 30/1500Z SFC/FL410 N1345 W02445 - N1630 W02415 - N1915 W01915 - N1245  
W01130 - N1045 W01130 - N1545 W02215 - N1345 W02445  
FCST VA CLD +12 HR: 30/2100Z SFC/FL410 NO VA EXP  
FCST VA CLD +18 HR: 01/0300Z NO VA EXP  
RMK: EXERCISE AFI VOLCEX21 EXERCISE PLEASE DISREGARD EXERCISE EXERCISE EXERCISE  
NXT ADVISORY: NO LATER THAN 20211130/1200Z=

**AFI VOLCEX 2021/01 Directives**

**SIGMET 4**

WVPH31 GVAC 301120  
GVSC SIGMET 4VALID 301120/301520 GVAC-  
GVSC SAL FIR VA EXER VA ERUPTION MT VULCAO DO FOGO PSN N1456 W02420 VA CLD OBS  
AT 1100Z WI N1515 W02216 – N1521 W02146– N1516 W02114 – N1511 W02043 SFC/FL410  
FCST AT 1630Z WI N1512 W01909 – N1510 W01805 –N1510 W01658– N1510 W01534  
SFC/FL410

**NOTAM 4**

(A0080/21 NOTAMR A0079/21  
Q) GVSC/QWWWXX/IV/NBO/W/000/410/1456N02420W250  
A) GVSC  
B) 2111301125  
C) 2112011125 EST  
E) VA EXERCISE AFI VOLCEX 21/01.  
ERUPTION OF VOLCANO MT VULCAO DO FOGO ID 384010 SINCE 211129 0800Z  
PSN N1456 W2420 ELEV 9281FT / 2829M  
VOLCANIC ASH OBSERVED UP TO 250 NM (HEIGHT 41000FT) MOVING EASTWARD AT 165KT. SO2 NOT  
SEEN  
EXERCISE EXERCISE EXERCISE.  
F) SFC  
G) 41000FT AMSL)

**CANCEL EXERCISE**

VONA CANCEL EXERCISE  
AFI VOLCEX 21/01  
(1) VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)  
(2) Issued: 20211130/1210Z

***AFI VOLCEX 2021/01 Directives***

(3) Volcano:	Volcão do Fogo 384010
(4) Current Aviation Colour Code:	Green
(5) Previous Aviation Colour Code:	Red
(6) Source:	INMG – VO
(7) Notice/Number:	2021/02
(8) Volcano Location:	N1456W02420
(9) Area:	Cabo Verde
(10) Summit elevation:	9281 feet (2829 m)
(11) Volcanic Activity Summary:	ERUPTION AT 2021 29 11 /0800Z NO ASH CLOUD
(12) Volcanic Ash Height:	VA NOT IDENTIFICABLE, ground observer
(13) Remarks:	NO ASH PRODUCTION
(15) Contacts:	INMG-DSV Tel +238 2326622 Fax +232 32402 Cell +238 9925838

EXERCISE VOLCEX TERMINATED

ENDEX 1210Z

VAA – VAAC Toulouse

FOGO - 2021-11-30 12:15 utc

VA ADVISORY  
STATUS: EXER  
DTG: 20211130/1215Z  
VAAC: TOULOUSE  
VOLCANO: FOGO 384010  
PSN: N1456 W02421  
AREA: CAPE VERDE ISLANDS  
SUMMIT ELEV: 2829M  
ADVISORY NR: 2021/3  
INFO SOURCE: EXERCISE AFI VOLCEX 21/01 EXERCISE

***AFI VOLCEX 2021/01 Directives***

AVIATION COLOUR CODE: UNKNOWN

ERUPTION DETAILS: AFI VOLCEX21 END OF EXERCISE

OBS VA DTG: 30/1215Z

OBS VA CLD: NO VA EXPECTED VA NOT IDENTIFIABLE FM SATELLITE DATA

FCST VA CLD +6 HR: 30/1815Z NO VA EXP

FCST VA CLD +12 HR: 01/0015Z NO VA EXP

FCST VA CLD +18 HR: 01/0615Z NO VA EXP

RMK: EXERCISE EXERCISE EXERCISE – END OF EXERCISE

NXT ADVISORY: NO FURTHER ADVISORIES=

**SIGMET 5**

WVPH31 GVAC 301220

GVSC SIGMET 5VALID 301220/301235 GVAC-

GVSC SAL FIR EXER CANCEL SIGMET 01 290945/301345

NOTAM CANCELING ERUPTION

(A0082/81 NOTAMC A0080/21

Q) GVSC/QWWXX/IV/NBO/W/000/999/1456N02420W999

A) GVSC

B) 2111301225

E) VA EXERCISE AFI VOLCEX 21/01. ERUPTION OF VOLCANO MT VULCAO DO FOGO ID 384010 PSN N1456 W2420 HAS CEASED AS REPORTED BY SIGMET AT 1220 UTC. VOLCANIC ASH CLOUD HAS DISSIPATED. VOLCANIC ASH CLOUD NO LONGER VISIBLE.

EXERCISE EXERCISE EXERCISE

F)

G)

EXERCISE VOLCEX TERMINATED.

ENDEX 1225Z

**AFI VOLCEX 2021/01 Directives**

**NOTAM FINISHING EXERCISE**

(A0082/21 NOTAMC A0077/21

Q) GVSC/QAFX/IV/NBO/E/000/999/1830N02845W999

A) GVSC B) 2111301230

E) VA EXERCISE AFI VOLCEX 21/01 FINISHED

CANCEL EXERCISE EXERCISE EXERCISE

Addresses for NOFs to use to send ASHTAMs or NOTAMs on volcanic activity to their associated VAAC in The AFI Region

NOF States	Addresses for NOFs to use to send ASHTAMs or NOTAMs on volcanic activity to their associated VAAC in AFI Region
Cameroon	LFPWYMYX EGZZVANW
Cape Verde	LFPWYMYX EGZZVANW
Comoros	LFPWYMYX EGZZVANW
Democratic Republic of Congo	LFPWYMYX EGZZVANW
Eritrea	LFPWYMYX EGZZVANW
Ethiopia	LFPWYMYX EGZZVANW
French	LFPWYMYX EGZZVANW
Kenya	LFPWYMYX EGZZVANW

**AFI VOLCEX 2021/01 Directives**

**NOTAM Distribution List**

DAAAYNYX	GGOVYNYX	DGAAAISX	SVMIIYNYA	SBRJYNYX	SBZZNJBX
DGAAYNYX	GCCCYOYX	GOZZNCVT	SUMUYNXX	FZAZYNYX	FAJSSAAO
FAATYNYX	FAJSYNYX	ZBTJOIXX	DNLLYNYX	FAZZNAXX	FCZZNAXX
LPZZNSAL	LKZZNAGV	LPPTTAPY	KDZZNAXX		
GVACFDPX	GVBAZPZX	GVACZPZX	GVSVPZPX	GVACYSYX	GVNPZPZX
LFPWYMYX	EGZZVANW				

**ASHTAM Distribution List**

DAAAYNYX	GGOVYNYX	DGAAAISX	SVMIIYNYA	SBRJYNYX	SBZZNJBX
DGAAYNYX	GCCCYOYX	GOZZNCVT	SUMUYNXX	FZAZYNYX	FAJSSAAO
FAATYNYX	FAJSYNYX	ZBTJOIXX	DNLLYNYX	FAZZNAXX	FCZZNAXX
LPZZNSAL	LKZZNAGV	LPPTTAPY	KDZZNAXX		
GVACFDPX	GVBAZPZX	GVACZPZX	GVSVPZPX	GVACYSYX	GVNPZPZX
LFPWYMYX	EGZZVANW				

**Table 1.** Special air-report as spoken in radiotelephony

<p>AIREP SPECIAL</p> <p>SZN208 N1517 W02049 1000Z FL190 ASH CLD VA EXERCISE AFI VOLCEX21/01</p> <p>EXERCISE EXERCISE EXERCISE</p>
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**Table 2.** Special air-report as recorded by the ATS unit and forwarded to the MET office concerned

<p>ARS</p> <p>SZN208 N1517 W02049 1000Z FL190 ASH CLD VA EXERCISE AFI VOLCEX21/01</p> <p>EXERCISE EXERCISE EXERCISE</p>
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**13. DIRECTING STAFF**

<b>Role</b>	<b>Names</b>	<b>Agency</b>	<b>e-mails address</b>
Exercise Leader	Alberto Silva	Civil Aviation Authority	alberto.silva@aac.cv
Lead Volcano Observatory	Bruno Faria	VO Cape Verde -INMG	brunofaria@sapo.cv
Lead VAAC	Philippe Hereil	VAAC Toulouse	Philippe.Hereil@meteo.fr
Lead ACC	Margarett Graça	ACC SAL / (GVSC)	margarett.marques@asa.cv
Lead MWO	Suely Gonçalves	MWO SAL/ (GVAC)	su_ely21@hotmail.com
Lead NOF	Aristides Martins	NOF SAL/ (GVAC)	csgia@asa.cv
Nation Supervisory Authority	Alberto Silva Micael Moreno	Civil Aviation Authority	alberto.silva@aac.cv Micael.moreno@aac.cv
APIRG IIM/SG MET Project 2 Coordinator - Senegal	Niokhor Diouf	ANACIM	niokhor.diouf@anacim.sn
RODB Dakar	OKILI Marie Claude	Senegal	OKILIMar@asecna.org
RODB Pretoria	Maluta Tshifaro	South Africa	Maluta.Tshifaro@weathersa.co.za
Kenya Volcanic Ash Focal Point	Frederick Etemesi	Kenya	etemesi_fred@yahoo.com
Airlines	Robert Oberstar	IATA Delta Airlines	robert.oberstar@delta.com

**AFI VOLCEX 2021/01 Directives**

	Kaspars Vitols	Emirates	kaspars.vitols@emirates.com
Assistance and facilitation	Chinga Mazhetese	ICAO ESAF Office	cmazhetese@icao.int
	Ogutu Keziah		cmazhetese@icao.int
	Lekamisy Harvey Gabriel		hlekamisy@icao.int
	Albert Aidoo Taylor	ICAO WACAF Office	Ataylor@icao.int
	Fanf� Bamba		FBamba@icao.int
	Fran�ois Xavier Salambanga		FSalambanga@icao.int
	Goama Ilboudo		Gilboudo@icao.int
	Djibril SEIBOU		djibril.seibou@airsenegalsa.sn

**14. SPECIAL INSTRUCTIONS**

14.1 Lead: The lead of teleconference calls should be Alberto Silva.

14.2 Expected Participants and general information expected from each:

- a. **VO** – Brief update on eruption status, latest height information, source of height information; duration of event, expected activity
- b. **VAAC** – Brief update on VAA/VAG (are observations such as aircraft reports being used to update products)
- c. **MWO** – Brief update on SIGMET (if different from VAA/VAG, briefly explain why)
- d. **NOF** – Brief update on NOTAM and published reroutes
- e. **ACC** – Brief update on reroutes and coordination with ACCs and ATMCs
- f. **ATMC** – Brief update on overall strategy (coordination with other ATMCs and ACCs)
- g. **Airlines** – Brief update on tactical reroutes, flight plan changes and satisfaction with reroutes
- h. **ATMC** – Response, if necessary, to airlines
- i. **ACC** – Response, if necessary, to ATMCs and airlines

14.3 Information sharing:

- Web portal should be available to obtain volcanic ash related products and information.



## ***AFI VOLCEX 2021/01 Directives***

### 14.4 Language:

- English and French.

### 14.5 Microphones:

- Each Participant should mute microphones to reduce background noise.
- The Leader of the teleconference will instruct the participant when to speak. When other features are available, the Leader would mute and controls when participants speak.