

SUMMARY OF DISCUSSIONS OF THE
DEBRIEF MEETING OF THE EUROPEAN AND NORTH ATLANTIC
VOLCANIC ASH
EXERCISE in 2018 (EUR/NAT VOLCEX18)
&
PLANNING MEETING OF VOLCEX19
&
VOLCEX/SG/14

(Napoli, Italy, 15-17 January 2019)

1. Introduction

1.1 The Debrief Meeting of the European and North Atlantic Volcanic Ash Exercise in 2018 (EUR/NAT VOLCEX18) was held in Napoli, Italy on 15 January 2019 and hosted by ENAC (the Italian Civil Aviation Authority) and assisted by ENAV (the Italian Air Navigation Service Provider), Italian Air Force (ITAF), Istituto Nazionale di Geofisica and Vulcanologia (INGV) – Osservatorio Vesuviano (INGV-OV) and Società Gestione Servizi Aeroporti Campani (G.E.S.A.C S.p.A).

1.2 The meeting was chaired by Arni Gudbrandsson of ISAVIA (Air Navigation Service Provider of Iceland), and the Secretary of the meeting was Mr. Christopher Keohan of the ICAO EUR/NAT Office, Paris.

1.3 The meeting was attended by 44 experts representing 16 States, 3 from Naples International Airport, 1 Airline, 1 University, and 5 International Organizations (Eurocontrol, European Commission, International Air Transport Association (IATA), International Federation of Air Line Pilots' Association (IFALPA) and International Civil Aviation Organization (ICAO)). The list of participants and contact list are presented at **Appendix A** and **Appendix B** respectively.

1.4 The meeting adopted the updated provisional agenda as provided in **Appendix C**.

2. Recapitulation of Exercise VOLCEX18

2.1 The meeting recalled the VOLCEX18 Exercise Scenario that involved a simulated eruption of Öräfajokull, Iceland erupting at 0200 UTC on 25 November 2018 that eventually impacted the British Isles, a large part of Continental Europe and east to the Russian Federation and west into the Canadian FIRs. The Exercise took place on 28 November 2018 from 0800 – 1600 UTC. The objectives of the exercise were the same as VOLCEX17 with the following additions: emphasis on limiting the use of Danger Areas in accordance to the Volcanic Ash Contingency Plan (VACP) for the EUR/NAT Regions, Attachment X4; conduct workshop on exercise preparation with an emphasis on reviewing the new merged VACP and Exercise Directive (open to everyone with an emphasis on ANSPs, MWOs, NOFs and National Regulators); clarification on the transmission/dissemination of special air-reports on volcanic ash from aircraft via Very High Frequency (VHF), Controller Pilot Data Link Communications (CPDLC) and SATCOM (pre-coordination with operator needed) as well as clarification on the ICAO method of disseminating these reports; test airport readiness in situation with high numbers of stranded passengers due to flight cancellations; and test airport diversion

capability information distribution (enhanced Network Manager (NM) tool plus procedures). The complete list of aims and objectives of VOLCEX18 are provided at **Appendix D**.

2.2 VAAC London generated the Volcanic Ash Advisories (VAA) and Volcanic Ash Advisories in Graphical Form (VAG) and the United Kingdom MET Office generated Volcanic Ash Concentration Charts at 6 hourly intervals in support to the EUR/NAT VACP.

2.3 Teleconferences organized by Network Manager discussed the current Air Traffic Management (ATM) network situation (based on Air Traffic Flow Management (ATFM) simulation) as well as outlook (based on VAAC charts) for the following 24 hours.

2.4 The ATM network simulation made the following assumptions: only departures and arrivals from/to airports under high density ash clouds were cancelled; all other flights were operated (including all incoming long-haul) and re-routed around high ash concentration airspace, except in case of unrealistic level capping for more than 200 NM and/or reroutes adding more than 800 NM; flight operations took place in airspace with low and medium ash concentration, but no flights entered airspaces of high ash concentration; and the traffic assessed was based on the operational situation valid around the time of the operational teleconferences. This resulted in approximately 1,400 rerouted and 8,600 cancelled flights.

2.5 Participants of VOLCEX18 included approximately 30 airline operators, IATA, Aircraft Operator Crisis Coordination Cell (AOCCC), European Aviation Crisis Coordination Cell (EACCC), Network Manager, approximately 27 ANSPs providing ATS, MET and NOTAM services, VAAC London (VAAC Toulouse backup), and 11 other organisations.

3. Exercise VOLCEX18 recommendations

3.1 The meeting was provided presentations or briefings by Volcanic Ash Advisory Centre (VAAC) London, Iceland Meteorological Office (IMO), Danish Air Transport, Norway Civil Aviation Authority (CAA), Sweden CAA, Poland CAA, Serbia Civil Aviation Directorate (CAD), Serbia and Montenegro Air Traffic Services (SMATSA), Main ATM Centre of the Russian Federation, France Director General Civil Aviation (DGCA), Slovenia Control, United Kingdom NATS, ENAC and ENAV Italy, Network Manager of EUROCONTROL, IATA and IFALPA.

3.2 Based on the presentations and meeting input, the meeting agreed to the following recommendations:

- **National Procedures:**

- Request ANSPs to ensure that local operations procedures are updated (and in some cases developed) in line with national Safety Risk Assessment (SRA) policies which should be in line with the EUR/NAT Volcanic Ash Contingency Plan (EUR Doc 019, NAT Doc 006, Part II);
 - This would assure harmonization of SRA methodology approach;

- **Scenario Attributes:**

- Continue combination of 1-day preparatory workshop with 1-day exercise (continue to focus on participant preparedness);
- Continue starting the eruption day(s) before the exercise depending on the weather conditions;

- **Collaborative Decision Making (CDM):**

- Teleconferences:
 - Revise timing of various teleconference (e.g. the first one is one hour earlier than in VOLCEX18);
 - Consider including in the Exercise Directive an agenda and general guidelines (avoid duplication of information) related to what is expected by each participant in the teleconferences;
 - Clarification in the Exercise Directive that the VAACs only need to participate in the operational teleconference in the first ten minutes of the teleconference;
 - Provide instructions on how to participate in the teleconferences for those States outside of the EUROCONTROL footprint;
 - **ATM:**
 - UK NATS and EUROCONTROL to coordinate on ATM network impact simulation such that the NAT Tracks align with the atypical traffic pattern in EUR;
 - **EVITA:**
 - Disable access to NOP live VOLCEX EVITA;
 - Include an explanation in the Exercise Directive what the purpose (including its outlook for further development) of EVITA is in the exercise;
 - **Participation:**
 - Expand involvement of airports (updated information on diversion capability and stranded passengers) in VOLCEX;
 - Strongly encourage Canada and VAAC Montreal to participate in the next relevant exercise;
 - **VAACs:**
 - Consider including in Exercise Directive where satellite annotation of ash can be found on web-site;
 - Provide presentation on what and how volcanic ash observations from other States (including special air-reports on volcanic ash) are used at the VAACs at the next volcanic ash workshop;
 - Use appropriate scale and projection of volcanic ash graphic depending on latitude;
 - reduce line thickness in VAG;
 - Consider use of google earth KML files with time-slider capability;
 - **Danger Area:**
 - do not issue Danger Area with ash concentration (or forecast of) – comply with the EUR/NAT VACP;
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- **NOTAM:**
 - Issue in accordance to the EUR/NAT VACP:
 - Consider adding checklist in Exercise Directive provided by ENAV Italy;
 - Do not issue horizontal and vertical extent of ash cloud (no matter what the contamination level) in NOTAM;
 - Do not issue a NOTAM for various flight levels or various concentration levels (text part of NOTAM);
 - **SIGMET:**
 - Continue improving (in some cases develop procedure on) cross-border SIGMET coordination;
 - Share best practices in accordance to Annex 3 (web-platform used, etc.) at appropriate forums (e.g. METG, Volcanic Ash Workshops);
 - **Special Air-Reports**
 - Clarify in the Exercise Directive that when a special air-report is provided by an airline via CPDLC, the ACC provides an ACK return message;
 - Include example of special air-report in Exercise Directive using format in accordance with Annex 3, Appendix 6, Table A6-1B for disseminating the special air-report from the MWO to the appropriate ROC for onward dissemination (e.g. VAACs, SADIS);
 - Consider including in the Exercise Directive a reference to PANS-ATM that prescribes how long a special air-report on volcanic ash is valid;
 - **Report Template**
 - Include in report template that States indicate number of NOTAMs and SIGMETs issued;
 - Consider general review of the template and modify where necessary;
 - **External Communications:**
 - Consider increasing external awareness of the VOLCEX through media;
 - **Commercial Providers:**
 - Airlines to communicate to their commercial providers of the use of EXERCISE in their volcanic ash exercise messages and participating commercial providers to be listed in the Exercise Directive under 'other organizations';
 - **Contacts:**
 - Emphasize adding generic operational contact (operation position, if applicable) in the PoCs listed in the Exercise Directive (excluding AOs);
 - **Examples in Directives:**
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- Clarify that the examples (e.g. NOTAM, SIGMET) in the Directives are for format purposes and that a reproduction of those examples by other States is not appropriate;

4. VOLCEX19 planning meeting

4.1 The meeting was chaired by the new Exercise Leader of VOLCEX19, Angelo Romito, ANSP Inspector/MET Regulator of ENAC Italy, and the Secretary of the meeting was Christopher Keohan of ICAO EUR/NAT Regional Office, Paris.

4.2 The meeting was presented with information on the Volcanic Ash Impacts on Jet Engines and Developments since 2010 delivered by Mr. Rory Clarkson, Engine Environmental Protection Associate Fellow at Rolls-Royce (Aero Engines). The meeting noted with considerable interest the research that had been conducted by Rolls-Royce into jet engine tolerance to ash dosage. The meeting also noted that in March 2019, the European Natural Airborne Disaster Information and Coordination System for Aviation (EUNDADICS-AV) will test in coordination with IFALPA hypothetical procedures that would use the dosage information for those aircraft with Rolls-Royce jet engines (maximum time to fly in 4 mg/m^3 volcanic ash concentration = 1 hour).

4.3 The meeting recalled the VOLCEX18 debrief meeting recommendations when formulating the VOLCEX19 objectives as listed below.

- Exercise the merged EUR/NAT Volcanic Ash Contingency Plan (EUR Doc 019, NAT Doc 006, Part II);
 - For individual States: test the effectiveness of their national procedures in accordance with the ICAO plan including that local operations (e.g. NOF, MWO, ANSP) procedures are updated (and in some cases developed) in line with national SRA policies;
 - For all participants: test the effectiveness of local (organizational) volcanic ash contingency plans and/or procedures; and
 - Exercise the origination, dissemination, reception and use of volcanic ash related aeronautical/meteorological information (including VAA/VAG, VA supplementary information, VA SIGMET and NOTAM and special air-reports on volcanic activity); ensure that NOTAM are in accordance with Annex 15 and the ICAO EUR/NAT Volcanic Ash Contingency Plan;
 - Limit the use of Danger Areas in accordance to the VACP, Attachment X4;
 - Conduct workshop on exercise preparation with an emphasis on reviewing the new merged VACP and Exercise Directives (open to everyone – with an emphasis on ANSPs, MWOs, NOFs and National Regulators);
 - Exercise and evaluate crisis coordination between the various stakeholders through EACCC (the European Aviation Crisis Coordination Cell) and the Aircraft Operator Crisis Coordination Cell (AOCCC);
 - Test the ATM responsiveness to need of AO operational flexibility;
 - Test transmission/dissemination of special air-reports on volcanic ash from aircraft via VHF, CPDLC and SATCOM (pre-coordination with operator needed);
 - According to ICAO scheme: AO → ACC → MWO → ROC and VAAC (ICAO AFS: AFTN/AMHS/RODEX, SADIS);
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- Their upload and display on the NM NOP Portal/EVITA Tool; and
- Test the display of special air reports by the US NWS using the information provided on the WIFS that should mirror the information provided on SADIS in this regard (verified by VAAC London) (tbc);
- Test cross-border SIGMET coordination;
- Test airport readiness in situation with high numbers of stranded passengers due to flight cancellations;
- Share airport volcanic ash surface status information via Airport Corner; and
- Test airport diversion capability information distribution;

4.4 The Directing Staff (DISTAFF) for VOLCEX19 was determined to be as follows:

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4.5 The meeting also agreed to the following VOLCEX19 attributes and milestones.

- Volcano Name: Vesuvio (volcano no. 211020)
- Location: Italy
- Eruption time: prior 20 November 2019 (will elaborate in Exercise Directive)
- Duration: 20 November 2019 (Exercise from 0800-1600 UTC)
 - VOLCITA 2019 nested in VOLCEX19 the day before (test national contingency procedures)
 - VAAC products issued every 6 hours
 - First operational telcon at 0900 UTC, second operational telcon of day at 1330 UTC
- Plume attributes:
 - Beyond day 1 (20 November 19): Issued by VAAC Toulouse
 - The plume is expected to impact multiple EUR States possibly reaching E MED (make area such that there is a significant number of States involved) and the time delay from the eruption to the day of the exercise will be chosen such that there will be a significant impact to EUR

Milestones

- **End of April 2019** – VAAC products available
- **1 Aug 2019** – Initial draft of Exercise Directive available to all the DISTAFF
- **1400 local 2 Oct 2019 to CoB 3 Oct 2019, Paris** – exercise prep workshop, open to everyone, with an emphasis on ANSPs, MWOs, NOFs, and National Regulators
- **29 Oct 2019** – Final VOLCEX19 Exercise Directive available
- **~4/5 Nov 2019** – first preparatory telcons for Regulators/ANSPs/MWOs/NOFs
- **~4/5 Nov 2019** – second preparatory telcons for AOs
- **20 Nov 2019** – VOLCEX19
- **6 Dec 2019** – individual reports due from participants
- **13 Dec 2019** – consolidated reports due
 - significant findings should be provided in lessons learned and recommendations
- **wk of 21 Jan 2020** - VOLCEX19 debrief meeting and VOLCEX20 planning meeting, Italy (Rome)
- **1st week Feb 2020** – VOLCEX19 final report posted on the ICAO EUR/NAT RO website

5. VOLCEX/SG/14

5.1 The meeting toured INGV-OV (National Institute of Geophysics and Volcanology – Osservatorio Vesuviano in Italy) and was provided by two presentations on operations as well as a tour of the facility and of the OPS room of the Volcano Observatory. The meeting agreed to the updated VOLCEX/SG future work programme as provided at **Appendix E**.

6. Any other business

6.1 The meeting thanked ENAC ENAV S.p.A, INGV-OV and G.E.S.A.C. S.p.A, Italy for successfully hosting this series of volcanic ash exercise meetings. The meeting concluded at 1400 on 17 January 2019.

Appendix A

*VOLCEX18 Debrief; VOLCEX19 Planning and VOLCEX/SG/14 Meetings
Naples, Italy, 15-17 January 2019*

LIST OF PARTICIPANTS

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Total of participants: 44

Appendix B

VOLCEX18 Debrief; VOLCEX19 Planning and VOLCEX/SG/14 Meetings*Naples, Italy, 15-17 January 2019***Contact List**

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Appendix C

EUR/NAT VOLCEX18 DEBRIEF MEETING

15 January 2019

(Hotel Royal Continental - Posillipo Room (Via Partenope 38/44 80121) Naples (NA))

Provisional Agenda

15 January 2019		
Time	Item	Lead
0830	<i>Registration</i>	--
0900	Welcome and opening of the meeting , including: <ul style="list-style-type: none"> • Purpose and conduct of the Debrief Meeting; and • Adoption of the provisional agenda. • 	Secretary
0915	Recapitulation of Exercise VOLCEX18 , including: <ul style="list-style-type: none"> • Scenario; • Participating agencies and Directing Staff (DISTAFF); and • Aims and Objectives. 	Exercise Leader
0930	Exercise VOLCEX18 lessons learned, recommendations and conclusions: <ul style="list-style-type: none"> • Volcanic Ash Advisory Centres; • Meteorological Watch Offices; • Air Navigation Service Providers; 	Exercise Leader based on the Initial Exercise Reports submitted
1045	<i>Coffee break</i>	--
1100	Exercise VOLCEX18 lessons learned, recommendations and conclusions: <ul style="list-style-type: none"> • International NOTAM Offices; • Aircraft Operators and IATA; 	Exercise Leader based on the Initial Exercise Reports submitted
1230	<i>Lunch break</i>	--
1345	Exercise VOLCEX18 lessons learned, recommendations and conclusions: <ul style="list-style-type: none"> • National supervisory authorities; • Eurocontrol; and • Others 	Exercise Leader based on the Initial Exercise Reports submitted
1500	<i>Coffee break</i>	--

.../...

15 January 2019		
Time	Item	Lead
1530	Key messages arising from Exercise VOLCEX18: Taking into consideration the aims and objectives of Exercise VOLCEX18, and based on the lessons learned, recommendations and conclusions discussed, the meeting will identify those key messages to be put for the consideration, if necessary, by the European and North Atlantic Volcanic Ash Exercises Steering Group (EUR/NAT VOLCEX/SG) or where appropriate, EANPG COG and NAT IMG, particularly in the context of the Volcanic Ash Contingency Plan for the EUR/NAT Region.	Exercise Leader
1630	Any other business	Secretary
1700	Close	--

EUR/NAT VOLCEX19 PLANNING MEETING

16 January 2019

(Hotel Royal Continental - Posillipo Room (Via Partenope 38/44 80121) Naples (NA))

Provisional Agenda

16 January 2019		
Time	Item	Lead
0900	Welcome and opening of the meeting <ul style="list-style-type: none"> • Purpose and conduct of the Planning Meeting; and • Adoption of the provisional agenda 	Secretary
0915	VOLCEX19 framework (following guidelines provided in Appendix F of Doc 9766 and OPINS), including: <ul style="list-style-type: none"> • Determination of Exercise Leader and Directing Staff; • Participants including States, International Organizations, airlines and other bodies; • Exercise aims and objectives considering recommendations from VOLCEX18 debrief meeting and any requests from parent groups; 	Exercise Leader
1045	<i>Coffee Break</i>	--
1100	Exercise scenario planning, including: <ul style="list-style-type: none"> • Exercise volcano; • Exercise duration; • Role of VAACs, MWOs, ACCs, Network Manager, MATMC, EACCC, volcano observatory, IATA and airline operators, national supervisory authorities, and other players; • Communications • Exercise Directives; • Initial Exercise Reports; • Exercise Debrief; and • Final Exercise Report 	Exercise Leader
1230	<i>Lunch</i>	--
1400	Continue with Exercise scenario planning	Exercise Leader
1530	<i>Coffee</i>	--
1545	Summarize VOLCEX19 planning	Exercise Leader

EUR/NAT VOLCEX/SG/14 Meeting**17 January 2019**

(INGV-Osservatorio Vesuviano (Via Diocleziano 238 Naples- Italy))

Provisional Agenda

17 January 2019		
Time	Item	Lead
0930	Visit to ING-OV <ul style="list-style-type: none">• Welcome of the Director and presentation of INGV-OV activities in the framework of Volcanic Ash;• Short guided visit to the INGV-OV OPS Room	ENAC/INGV-OV
1230	<i>Lunch and return to meeting room</i>	--
1400	VOLCEX/SG/14 <ul style="list-style-type: none">• Adapt VOLCEX/SG future work programme;• Review ToRs;• Any other business	Secretary

-- END --

Appendix D – Aims and Objectives of VOLCEX18

- Exercise the merged EUR/NAT Volcanic Ash Contingency Plan (EUR Doc 019, NAT Doc 006, Part II)
 - For individual states: test the effectiveness of their national procedures in accordance with the ICAO plan;
 - For all participants: test the effectiveness of local (organizational) volcanic ash contingency plans and/or procedures; and
 - Exercise the origination, dissemination, reception and use of volcanic ash related aeronautical/meteorological information (including VAA/VAG, VA supplementary information, VA SIGMET and NOTAM and special air-reports on volcanic activity); ensure that NOTAM are in accordance with Annex 15 and the ICAO EUR/NAT Volcanic Ash Contingency Plan;
 - Limit the use of Danger Areas in accordance to the VACP, Attachment X4;
 - Conduct workshop on exercise preparation with an emphasis on reviewing the new merged VACP and Exercise Directives (open to everyone – with an emphasis on ANSPs, MWOs, NOFs and National Regulators);
- Exercise and evaluate crisis coordination between the various stakeholders through EACCC (the European Aviation Crisis Coordination Cell) and the Aircraft Operator Crisis Coordination Cell (AOCCC);
- Test the ATM responsiveness to need of AO operational flexibility;
- Test transmission/dissemination of special air-reports on volcanic ash from aircraft via VHF, CPDLC and SATCOM (pre-coordination with operator needed);
 - According to ICAO scheme: AO->ACC->MWO->ROC and VAAC (ICAO AFS: AFTN/AMHS/RODEX, SADIS);
 - Their upload and display on the NM NOP Portal/EVITA Tool;
 - Verify number of reports received at NM and VAACs;
- Test cross-border SIGMET coordination;
- Test airport readiness in situation with high numbers of stranded passengers due to flight cancellations; and
- Test airport diversion capability information distribution (enhanced NM tool plus procedures).

APPENDIX E – EUR/NAT VOLCEX/SG FUTURE WORK PROGRAMME

Updated 17 January 2019

2019 TO 2021

Date	Activity	Location
2,3 Oct 2019	<ul style="list-style-type: none">• VOLCEX19 Preparatory Workshop	Paris
Autumn 2019	<ul style="list-style-type: none">• VOLCEX19	Vesuvius
week of 21 Jan 2020	<ul style="list-style-type: none">• Debrief meeting for VOLCEX19• Planning meeting for VOLCEX20• VOLCEX/SG/15	Italy (Rome)
Sep-Oct 2020	<ul style="list-style-type: none">• VOLCEX20 Preparatory Workshop	Reykjavik or Oslo
Autumn 2020	<ul style="list-style-type: none">• VOLCEX20	Iceland
early 2021	<ul style="list-style-type: none">• Debrief meeting for VOLCEX20• Planning meeting for VOLCEX21• VOLCEX/SG/16	Toulouse or Exeter or Spain
Nov 2021	<ul style="list-style-type: none">• VOLCEX21	Spain or Portugal

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