



CORSIA EMISSIONS MONITORING PLAN SAMPLE

In order to prepare for the monitoring, reporting and verification (MRV) of CO₂ emissions, each operator will need to develop an emissions monitoring plan. The emissions monitoring plan shall include information on the operator, its fleet and operations. The emissions monitoring plan will also detail the methods that will be used by the operator to monitor fuel use and calculate emissions, and all associated data management.

The emissions monitoring plan is important for the verification process. It helps the verifier to understand the methods chosen, assess if they are consistent with the requirements under CORSIA and if they have been applied properly.

The emissions monitoring plan will have to be approved by the administrating authority, who should be satisfied that the processes described by the operator are appropriate and sufficient to comply with the prescribed MRV requirements. Before approving it, the administrating authority will review the emissions monitoring plan to ensure it is complete and consistent with the requirements of Annex 16 vol. IV. It will notably assess if the procedures in place are sufficient and and if the operator has a suitable data management plan in place.

The approval by the administrating authority will give the operator the assurance that the processes detailed in its emissions monitoring plan are satisfactory.

In order to assist operators with the preparation of their emissions monitoring plan, IATA has put together a few sample emissions monitoring plans for fictional airlines. These samples are solely aimed at illustrating the level of detail and type of information which we would recommend including in the emissions monitoring plan. **However:**

- **The template and the level of information to be included will ultimately depend on the expectations of individual ICAO Member States.** We would therefore urge all operators to check with their authorities which template they shall use and clarify any doubts they may have on the expectations of their administrating authority.
- **The procedures which are suitable and appropriate for one operator may not be appropriate for another operator.** Therefore, we would strongly caution against copying the descriptions in any of the sample emissions monitoring plans. Individual operators must make sure that the procedures they describe in their emissions monitoring plans are tailored for their organization and that they will be able to implement them as described.

An overview and comments for the three sample emissions monitoring plans are provided in a separate document.

For any questions, please do not hesitate to contact the IATA CORSIA team at corsia@iata.org.

CORSIA

EMISSIONS MONITORING PLAN (EMP)

CONTENTS

- 1 [Version control of Emissions Monitoring Plan](#)
- 2 [Aeroplane operator identification and description of activities](#)
- 3 [Fleet and operations data](#)
- 4 [Methods and means for calculating emissions](#)
 - 4.1 [Fuel Use Monitoring Method: Method A](#)
 - 4.2 [Fuel Use Monitoring Method: Method B](#)
 - 4.3 [Fuel Use Monitoring Method: Block-off / Block-on](#)
 - 4.4 [Fuel Use Monitoring Method: Fuel Uplift](#)
 - 4.5 [Fuel Use Monitoring Method: Fuel Allocation with Block Hour](#)
 - 4.6 [ICAO CORSIA CO₂ Estimation and Reporting Tool \(CERT\)](#)
- 5 [Data management, data flow, control system, risk analysis and data gaps](#)

Template Information

Template provided by:	
Version (publication date):	

Note: For the purpose of this template, international flight is defined as in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 2, 2.1.

1 VERSION CONTROL OF EMISSIONS MONITORING PLAN

a) Version No.

Please enter version number of the current version.

Version 1

b) Version control

If necessary, please fill in the table.

Version No.	No. of previous version	Date of update	Emissions Monitoring Plan is valid from	Chapters where modifications have been made. Brief explanation of amendments.
1	n/a	2018-09-01	2019-01-01	n/a

2 AEROPLANE OPERATOR IDENTIFICATION AND DESCRIPTION OF ACTIVITIES

(Annex 16, Volume IV, Appendix 4, 2.1)

a) Name of the aeroplane operator

Please enter the name of the aeroplane operator. This name should be the legal entity engaged in the aeroplane operation, or the legal entity seeking to be the single entity for the CORSIA administration under a parent-subsidiary arrangement.

Alpha Airlines

b) Address of the aeroplane operator

Please enter the address of the aeroplane operator.

Address line:	33 route de l'Aeroport
City:	Geneva
State/Province/Region:	
Postcode/ZIP:	1215
Country:	Switzerland

c) Legal representative

Please enter a contact address of a representative who is legally responsible for the aeroplane operator for official correspondence.

Title:	Ms
First name:	Christine
Surname:	Chappuis
Email address:	ceo@alpha-airlines.ch
Telephone number:	+41 22 123 45 67
Address line 1:	33 route de l'Aeroport
Address line 2:	
City:	Geneva
State/Province/Region:	
Postcode/ZIP:	1215
Country:	Switzerland

d) Aircraft identification of the aeroplane operator for international flights (Item 7 of the flight plan)

Select the options planned to be used for reporting flight attribution to the aeroplane operator.

ICAO Designator

Does Item 7 (aircraft identification) of the flight plan begin with an **ICAO Designator** according to Doc 8585 — Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services? If yes, please select "ICAO Designator" from the drop down list and complete d2).

Registration marks

Does Item 7 (aircraft identification) of the flight plan correspond to the **nationality or common mark, and registration mark**, as explicitly stated in an **AOC** (or equivalent)? If yes, please select "Registration marks" from the drop down list and complete d3).

ICAO Designator and registration marks

ICAO Designator: according to Doc 8585

d1) Responsibility under the CORSIA

Aeroplane operator that has been assigned the ICAO Designator

d2) ICAO Designator

Provide the ICAO Designator (or Designators) used for Air Traffic Control purposes, as listed in Doc 8585 — Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services, if the aeroplane operator has an ICAO Designator(s).

ALP

d3) List of registration marks

Please list all aeroplanes including the nationality or common mark, and registration mark, of the aeroplane. If your fleet exceeds 30 registration marks, please attach a separate document to the EMP.

No.	Registration mark	No.	Registration mark	No.	Registration mark
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

d4) Additional information on flight attribution

Please provide additional information to support the approach followed for flight attribution.

Flights operated by subsidiary company "Bravo Air" are performed under another ICAO Designator (BRV).
Cargo flights are operated by Air Delta under a wet-lease agreement, but performed using Alpha Airlines' ICAO Designator (ALP).

e) Do you have an air operator certificate (AOC)?

The air operator certificate (AOC) is a certificate authorizing an operator to carry out specified commercial air transport operations i.e., a document issued to an aeroplane operator by a Civil Aviation Authority which affirms that the aeroplane operator in question has the professional ability and organization to secure the safe operation of the aeroplane for the aviation activities specified in the certificate.

yes

e1) Identification code of the AOC

Please enter the unique identification number of the air operator certificate of the issuing Civil Aviation Authority. If you hold several AOCs, list the additional certificates in the field "Information about the certificate".

81231

e2) Date of issue

Please enter the date on which the air operator certificate was issued. Use the entry format yyyy-mm-dd.

1999-10-05

e3) Date of expiry

Please enter the date on which the air operator certificate expires (if applicable). Use the entry format yyyy-mm-dd.

2025-12-31

e4) Competent authority for the AOC

Please enter the address of the authority that issued the AOC.

Name of the authority:	Federal Office of Civil Aviation
Address line:	Muehlestrasse 2
City:	Ittigen
State/Province/Region:	
Postcode/ZIP:	3063
Country:	Switzerland

e5) Information about the certificate

Please give information about the scope of aviation activities the AOC permits to carry out. Are there any temporal, regional or other restrictions? Have any obligations been imposed?

The AOC authorizes Alpha Airlines to perform commercial air operations. There are no temporal, regional or other restrictions.

e6) Please attach the current versions of the AOCs covered in this Emissions Monitoring Plan; please confirm below

yes

f) Description of the ownership structure of your company

Details of ownership structure relative to any other aeroplane operators with international flights, including identification of whether the aeroplane operator is a parent company to other aeroplane operators with international flights, a subsidiary of another aeroplane operator (or operators) with international flights and/or has a parent and or subsidiaries that are aeroplane operators with international flights. Please describe the ownership structure of the operating company.

Alpha Airlines owns all shares in Bravo Air, a regional airline based in Geneva.
 Charlie Airways is the airline's largest shareholder, with a holding of 49%. The other 51% of shares are split between public and private shareholders.

f1) Parent-subsidiary relationship recognized as a single entity for the CORSIA administration?

Please specify whether the aeroplane operator is in a parent-subsidiary relationship which should be recognized as a single entity for the CORSIA administration?

yes

f2) Name of the subsidiary company(ies)

If your company heads a group, please specify the names of the subsidiaries which also carry out international aviation activities and select how aircraft identification of the subsidiary for international flights is managed. Where appropriate, please attach additional explanatory files to the Emissions Monitoring Plan.

Name of the subsidiary	Aircraft identification of the subsidiary for international flights (Item 7 of the flight plan)
Bravo Air	ICAO Designator: according to Doc 8585

f3) Confirmation that parent and subsidiary(ies) are administered by the same State

If the aeroplane operator in a parent-subsidiary relationship seeks to be considered a single aeroplane operator for purposes of the CORSIA, confirm that the parent and subsidiary(ies) are subject to CORSIA administration by the same State.

confirmed

f4) Confirmation that parent and subsidiary(ies) are wholly-owned by the parent

If the aeroplane operator in a parent-subsidiary relationship seeks to be considered a single aeroplane operator for purposes of the CORSIA, confirm that the subsidiary(ies) are wholly-owned by the parent.

confirmed

f5) Additional information on the subsidiary(ies)

Step 1: On the basis of the provided information in f3), please specify the aircraft identification of the subsidiary(ies) for international flights (Item 7 of the flight plan) according to the same level of detail as requested in d) (e.g., state ICAO Designator or list registration marks). Please indicate how flights are assigned to the parent/subsidiary operation.

Step 2: Please specify whether there are any other items covered in this Emissions Monitoring Plan where the subsidiary(ies) deviate from the monitoring of the parent.

In case of insufficient space below, please attach additional documents to your Emissions Monitoring Plan submission.

Flights operated by Bravo Air are performed using the "BRV" designator, and any flight operated under the BRV designator will be attributed to the subsidiary. Bravo Air operates two Cessna C208 Caravan (MTOM below 5.7 tonnes) and 1 Helicopter which are not subject to CORSIA.

Bravo Air's AOC (#81231, issued 5 Oct 1999, expiry 31 Dec 2025) authorizes Bravo Air to perform commercial air services, without specified restrictions.

g) Description of the aeroplane operator's activities

Please describe the aeroplane operator's activities. Provide details of main State pairs, typical leasing arrangements, scheduled/non-scheduled, pax/cargo/executive and geographic scope of operations.

Alpha Airlines is an airline based at Geneva International Airport (GVA/LSGG). Its operations are intercontinental and regional. They include passenger and all-cargo operations. All its cargo operations are operated under a wet-lease agreement by Air Delta, using Alpha Airlines' ICAO Designator. In addition to its normal scheduled flights, it also operates occasional charter humanitarian flights for the International Committee of the Red Cross. Alpha Airlines' subsidiary, Bravo Air, operates regional flights out of Geneva.

h) Contact person

Please enter the contact information of the person within the aeroplane operator who is responsible for the Emissions Monitoring Plan.

Title:	Ms
First name:	Silvia
Surname:	Meyer
Email address:	s.meyer@alpha-airlines.ch
Telephone number:	+41 22 123 45 67
Address line 1:	33 route de l'Aeroport
Address line 2:	
City:	Geneva
State/Province/Region:	
Postcode/ZIP:	1215
Country:	Switzerland

h1) Alternate contact person

Please enter the contact information of an additional person within the aeroplane operator who is responsible for the Emissions Monitoring Plan.

Title:	Ms
First name:	Florence
Surname:	Rapin
Email address:	f.rapin@alpha-airlines.ch
Telephone number:	+41 22 123 45 67
Address line 1:	33 route de l'Aeroport
Address line 2:	
City:	Geneva
State/Province/Region:	
Postcode/ZIP:	1215
Country:	Switzerland

3 FLEET AND OPERATIONS DATA

(Annex 16, Volume IV, Appendix 4, 2.2)

a) Fleet declaration

List all aeroplane types, including owned aeroplanes as well as leased aeroplanes, with an MTOM greater than 5 700 kg (12 566 lbs) operated on international flights, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 2, 2.1, at the time of submission of the Emissions Monitoring Plan as specified in Doc 8643 — Aircraft Type Designators.

Additional information about Doc 8643 — Aircraft Type Designators can be found at:

<http://www.icao.int/publications/DOC8643/Pages/Search.aspx>

No.	ICAO type designator	Fuel type	Number of aeroplanes
1	A321	Jet-A1	3
2	A332	Jet-A1	1
3	A332	Jet-A1	wet-lease
4	B788	Jet-A1	3
5	E190	Jet-A1	3
6	B748	Jet-A1	wet-lease
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

No.	ICAO type designator	Fuel type	Number of aeroplanes
21			
22			
23			
24			
25			
26			
27			
28			
29			
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b) Additional aeroplane types

Will new aeroplane types always be monitored using the same methods as aeroplane types identified in section 4 of this plan?

yes

b1) Details about the procedure for defining the monitoring methodologies for additional aeroplane types

Define clearly the methods which are used for monitoring new aeroplane types that are not already in use.

Responsible department

Description of procedure

Location of records

c) Changes in aeroplane fleet and fuel type

Please provide information on the procedure for how changes in aeroplane fleet and fuel used will be tracked and integrated in emissions monitoring.

Responsible department	Fleet planning department
Description of procedure	<p>The fleet planning department will provide regular updates on fleet acquisitions and retirements. At the latest 1 week before the delivery of a new aircraft, the fleet planning department will send a notification by email to the Environment department. The Environment department will keep an updated fleet declaration which will be submitted to the administrating authority on an annual basis with the verified emissions report. Prior to its submission, the information in the fleet declaration will be cross-checked with the information kept by the Fleet planning department.</p> <p>Alpha Airlines is expected the delivery in 3 A21N in 2019 and 3 A359 in 2019-2020. They are not included in the fleet declaration as they are not currently in operation, but the fuel monitoring method that will be used for these types is specified in the next section.</p>
Location of records	Fleet planning department and Environment department

d) Completeness of all aeroplanes and all flights

Please provide information on the means that will be used to track/document each aeroplane operated and the specific flights of the aeroplane to ensure completeness of monitoring.

Responsible department	Flight Operations Department
Description of procedure	<p>The technical logs for each flight operated by Alpha Airlines and for each scheduled flight operated by Bravo Air are sent routinely to the Flight Operations Department of Alpha Airlines upon the completion of each flight. The same procedure will become applicable to non-scheduled flights operated by Bravo Air from 1 November 2018.</p> <p>The technical logs are reconciled against the day of flight schedule and tracking system for completeness. Any missing Tech log reports are tracked down and data captured and entered into the day of flight data base. The Director Operations Control is responsible for the integrity of the Day of Operations database and to ensure that all required flight reports and records are received and logged in the Day of Operations database.</p>
Location of records	Flight Operations Department

e) List of State pairs operated by the aeroplane operator

Please list **all** State pairs where international flights are currently operated. If applicable, please list State pairs from the State of origin to the State of destination (*). If your State pairs exceed 50, please attach a separate document to the Emissions Monitoring Plan.

(*) For example, flights from State A to State B will require inserting a State pair A-B in the list; flights from State B to State A will require inserting a State pair B-A in the list.

No.	State of origin	State of destination
1	Switzerland	Austria
2	Austria	Switzerland
3	Switzerland	Canada
4	Canada	Switzerland
5	Switzerland	Colombia
6	Colombia	Switzerland
7	Switzerland	Egypt
8	Egypt	Switzerland
9	Switzerland	France
10	France	Switzerland
11	Switzerland	Germany
12	Germany	Switzerland
13	Switzerland	India
14	India	Switzerland
15	Switzerland	Kenya
16	Kenya	Switzerland
17	Switzerland	Portugal
18	Portugal	Switzerland
19	Switzerland	Russian Federation
20	Russian Federation	Switzerland
21	Switzerland	Singapore
22	Singapore	Switzerland
23	Switzerland	Spain
24	Spain	Switzerland
25		
26		
27		
28		
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30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
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47		
48		
49		
50		

f) Determination of all international flights

Please provide information on procedures for determining which aeroplane flights meet the definition of international flights for the purpose of Annex 16, Volume IV, and therefore are subject to the emissions monitoring requirements subject to applicability of Annex 16, Volume IV, Part II, Chapter 2, 2.1.

Responsible department	Environment department
Description of procedure	Alpha Airlines has developed a CORSIA IT tool to handle data used for the CORSIA emissions report. The tool will group flights by state pairs and exclude any domestic flights on the basis of a list of airports which will be maintained by the Environment Department. For each airport included in the database, the corresponding State will be identified on the basis of ICAO Doc 7910.
Location of records	Environment department

g) Determination of international flights with offsetting requirements

Please provide information on the procedures for determining which international flights are subject to CO₂ offsetting requirements under the CORSIA as described in Annex 16, Volume IV, Part II, Chapter 3, 3.1.

Responsible department	Environment department
Description of procedure	Alpha Airlines has developed a CORSIA IT tool to handle data used for the CORSIA emissions report. The tool will group flights by state pairs and exclude any domestic flights on the basis of a list of airports which will be maintained by the Environment Department. For each airport included in the database, the corresponding State will be identified on the basis of ICAO Doc 7910. On 1 September of each year, the Environment Department will obtain the ICAO document entitled "CORSIA States for Chapter 3 State Pairs" and identify all States to/from which flights will not be subject to offsetting requirements.
Location of records	Environment department

h) Determination of flights with no monitoring requirements

If the aeroplane operator conducts any domestic flights and/or humanitarian, medical or firefighting international operations that would not be subject to the emissions monitoring requirements, information on the procedures for how those operations will be separated from those subject to the emissions monitoring requirements.

Responsible department	Flight operations department
Description of procedure	When operating a humanitarian flight, the indicator STS/HUM is systematically used in item 18 of the flight plan. The information on the nature of a flight will be recorded in the Day of Operations database. The Environment Department will compile data from the Day of Operations database and exclude any flights which have been operated for humanitarian requirements. Similarly, the aircraft type will be included in the Days of Operations database, which will allow the Environment Department to exclude flights operated by aeroplanes which have a certified maximum take off mass below 5.7 tonnes. Electronic copies of the flight plans for operations without monitoring requirements will be kept by the Flight operations department.
Location of records	Flight operations department

4 METHODS AND MEANS FOR CALCULATING EMISSIONS

(Annex 16, Volume IV, Appendix 4, 2.3)

a) Fuel Use Monitoring Method and / or the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT)

Please specify whether the aeroplane operator plans to use one or more Fuel Use Monitoring Method(s) (as described in Annex 16, Volume IV, Appendix 2) and / or the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) (as described in Annex 16, Volume IV, Appendix 3) for the 2019-2020 and 2021-2035 periods. When deciding on the monitoring method, consideration should be given to whether the aeroplane operator is eligible for the same method in the 2019-2020 period as in the 2021-2035 period.

For the reporting years 2019 and 2020 (in accordance with Annex 16, Volume IV, Part II, Chapter 2, 2.2.1.2)

- a Fuel Use Monitoring Method is mandatory for aeroplane operators with annual emissions equal to or above 500 000 tonnes of CO₂ from international flights, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2 and Chapter 2, 2.1.
- an aeroplane operator with annual CO₂ emissions from international flights, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2 and Chapter 2, 2.1 of less than 500 000 tonnes, shall use either a Fuel Use Monitoring Method or the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT).

For the reporting years 2021 until 2035 (in accordance with Annex 16, Volume IV, Part II, Chapter 2, 2.2.1.3)

- a Fuel Use Monitoring Method is mandatory for aeroplane operators with annual emissions equal to or above 50 000 tonnes of CO₂ from international flights subject to offsetting requirements, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 3, 3.1. For international flights not subject to offsetting requirements, the aeroplane operator shall use either a Fuel Use Monitoring Method or the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT).
- an aeroplane operator with annual emissions from international flights subject to offsetting requirements, as defined in Annex 16, Volume IV, Part II, Chapter 1, 1.1.2, and Chapter 3, 3.1, of less than 50 000 tonnes, shall use either a Fuel Use Monitoring Method or the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT).

Fuel Use Monitoring Method

a1) Option for simplified monitoring on routes not subject to offsetting requirements

Aeroplane operators which use a Fuel Use Monitoring Method (as described in Annex 16, Volume IV, Appendix 2) for the 2021-2035 period have an option for simplified monitoring with the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) (as described in Annex 16, Volume IV, Appendix 3) on State pairs not subject to offsetting requirements. Please specify whether the aeroplane operator intends to use this option.

no

b) Fuel Use Monitoring Methods

Please provide information on the use of different monitoring methods per sub fleet (by ICAO aircraft type designator).

Monitoring method	Applicable for the following sub-fleets of aeroplanes (by ICAO aircraft type designator)	2019-2020 period	2021-2035 period
Method A			
Method B	B788, A332 (except wet-leased), A359 (entry in service in 2019)	yes	yes
Block-off / Block-on	A332 (wet-leased), B748 (wet-leased)	yes	yes
Fuel Uplift			
Fuel Allocation with Block Hour	A321, E190, A21N (entry in service in 2019)	yes	yes

c) Simplified monitoring method

Please provide information on use of the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT)

2019-2020 period	2021-2035 period

c1) Estimated annual CO₂ emissions

Please demonstrate the eligibility to use the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) by providing an estimate of fuel use in order to calculate an estimate of the total CO₂ emissions for international flights, as defined in Annex 16, Volume IV, Part II, Chapter 2, 2.1. If the ICAO CORSIA CERT was used to estimate the CO₂ emissions, enter the information in the field "Estimate from the ICAO CORSIA CERT". For 2019, the estimate can be based on data within the 2017-2018 period or another appropriate period.

Fuel type	Annual fuel use (in tonnes)	Fuel conversion factor	Annual CO ₂ emissions (in tonnes)
Jet-A		3.16	
Jet-A1		3.16	
Jet-B		3.10	
AvGas		3.10	
Estimate from the ICAO CORSIA CERT			

c2) Supporting information on estimation

Provide supporting information on how the estimation of emissions in c1) has been determined, including on how fuel use has been estimated. In case the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) has been used, a copy of the tool has to be attached and the input method (i.e., Great Circle Distance or Block Time) has to be stated.

c3) Input method for reporting

Please specify for the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) whether Great Circle Distance or Block Time is used to estimate emissions for the reporting periods.

d) Separation of parent-subsidiary related emissions in 2019-2020

If the aeroplane operator is in a parent-subsidiary relationship and intends to be considered a single aeroplane operator for purposes of the CORSIA, identify the procedures that will be used for maintaining separate 2019-2020 fuel and emissions monitoring of the various corporate entities for the purpose of establishing individual 2019-2020 reference CO₂ emissions for the parent and subsidiary (or subsidiaries).

The parent and subsidiary use different aircraft types and different ICAO designators, which will allow to easily segregate the monitoring of the parent and subsidiary.

4.1 Fuel Use Monitoring Method: METHOD A

a) Time of measurement and corresponding documentation for the chosen method

Please specify the exact points in time for the three measurements necessary to calculate the fuel consumption per flight and outline the measurement equipment and procedures for recording, receiving, transmitting and storing of fuel data. Please provide a reference to the corresponding documentation.

Not applicable

b) Fuel density for international flights

Please provide information on the procedures for determining and recording fuel density values (standard or actual) as used for operational and safety reasons and provide reference to the relevant internal documentation. These procedures shall be applied when calculating the fuel consumption for the CORSIA.

Not applicable

4.2 Fuel Use Monitoring Method: METHOD B

a) Time of measurement and corresponding documentation for the chosen method

Please specify the exact points in time for the three measurements necessary to calculate the fuel consumption per flight and outline the measurement equipment and procedures for recording, receiving, transmitting and storing of fuel data. Please provide a reference to the corresponding documentation.

Block-on fuel quantity is recorded when the aircraft stops moving at its designated parking position and parking brakes are set. In cases where a flight is preceded by an activity other than a flight, the quantity of fuel at block-on before the flight under consideration will be substituted with the amount of fuel in the tanks at the end of the previous activity. The mass of fuel in tanks at block-on will be given by the Fuel Quantity Indicators of the aircraft. The pilot in command will enter the measured mass into the Technical Log Book and send it electronically via ACARS to the Flight Operations Department.

The mass of fuel uplifts will be taken from the fuel split received from the fuel supplier. The pilot will enter the measured uplift into the Technical Log Book and send it electronically via ACARS to the Flight Operations Department.

Fuel data will be kept by the Flight Operations department in a dedicated database. Fuel splits are kept by the Fuel Accounting Team (Financial Services Department).

b) Fuel density for international flights

Please provide information on the procedures for determining and recording fuel density values (standard or actual) as used for operational and safety reasons and provide reference to the relevant internal documentation. These procedures shall be applied when calculating the fuel consumption for the CORSIA.

In accordance with the operations manual of Alpha Airlines, actual density will be used and obtained from the refueler. If the actual fuel density is not known, a standard fuel density of 0.80 kg/l is used.

4.3 Fuel Use Monitoring Method: BLOCK-OFF / BLOCK-ON

a) Time of measurement and corresponding documentation for the chosen method

Please specify the exact points in time for the two measurements necessary to calculate the fuel consumption per flight and outline the measurement equipment and procedures for recording, receiving, transmitting and storing of fuel data. Please provide a reference to the corresponding documentation.

The block-off/block-on method is used for aircraft which are wet-leased from Air Delta and the definition of the time of measurements are based on Air Delta's operational practices:

Block-off fuel quantities will be measured when the aircraft first moves from its parking place.

Block-on fuel quantities will be measured when the aircraft comes to rest on the designated parking position.

The mass of fuel in tanks at block-on and block-off will be given by the Fuel Quantity Indicators of the aircraft. The pilot in command will enter the measured mass into the Technical Log Book and send it electronically via ACARS to the Flight Operations Department.

Air Delta crews will enter the measurements in the Technical Log Book, an electronic copy of which will be sent to Air Delta's Flight Operations Department. Fuel and other operational data will be sent by Air Delta to Alpha Airline's Flight Operations department and Financial Services department on weekly basis.

4.4 Fuel Use Monitoring Method: FUEL UPLIFT

a1) Measurement of the block hours (per flight) and corresponding documentation for the chosen method

Please specify the exact points in time for the measurement of block hours per flight (necessary to calculate the fuel consumption per flight for international flights with zero uplift and for the following flight) and outline the measurement equipment and procedures for recording, receiving, transmitting and storing of fuel data. Please provide a reference to the corresponding documentation.

Not applicable

a2) Assignment and adjustment for flights with zero fuel uplift

Please explain the data handling and calculations necessary to meet the adjustment requirement for flights with zero fuel uplift.

Not applicable

b) Fuel uplift

Please specify which fuel uplift record will be used.

Not applicable

c) Fuel density for international flights

Please provide information on the procedures for determining and recording fuel density values (standard or actual) as used for operational and safety reasons and provide reference to the relevant internal documentation. These procedures shall be applied when calculating the fuel use for the CORSIA.

Not applicable

4.5 Fuel Use Monitoring Method: FUEL ALLOCATION WITH BLOCK HOUR

a) Option for calculating the specific fuel burn

Please choose from the options listed below and enter the ICAO type designators and the model for each option. Should one option for all aeroplane types be used, simply enter "all".

	Option	ICAO aircraft type designator / model
<input type="checkbox"/>	1 st Option for aeroplane operators which can clearly distinguish between fuel uplifts for international and domestic flights on a flight by flight basis. In case this option is selected, please also complete section 4.4 (Fuel uplift, a1 and a2), as this monitoring method is used to calculate the total fuel burn on international flights for a specific ICAO type designator or aircraft model.	A321, A21N
<input type="checkbox"/>	2 nd Option for aeroplane operators which cannot clearly distinguish between international and national fuel uplifts on a flight by flight basis.	E190

b) Measurement of the block hours (per flight) and corresponding documentation for the chosen method

Please specify the exact points in time for the measurement of block hours per flight and outline the measurement equipment and procedures for recording, receiving, transmitting and storing of fuel data. Please provide a reference to the corresponding documentation.

Block time is measured as the time between the last door is closed (block-off), until the aircraft stops moving at its designated parking position and parking brakes are set (block-on).
 For A321 and A21N aircraft, block time is recorded by the flight crews in the Technical Log Books. On A21N aircraft, the data will be transmitted automatically via ACARS to the flight operations department. On A321 aircraft, the information from the technical log books is entered manually into the Flight Ops Database.
 For E190 aircraft (operated by Bravo Air), block time is recorded by flight crews in the Technical Log Books. The information from the technical log books is then entered manually by Bravo Air's flight operations department and sent on a weekly basis to Alpha Airlines' flight operations department.

c) Fuel uplift

Please specify which fuel uplift record will be used.

Fuel slips received from the fuel supplier will be used to determine fuel uplift quantities. Copies of the fuel splits are kept by the Fuel Accounting Team (Financial Services Department) of Alpha Airlines for all flights operated by Alpha Airlines and Bravo Air.

d) Fuel density for international flights

Please provide information on the procedures for determining and recording fuel density values (standard or actual) as used for operational and safety reasons and provide reference to the relevant internal documentation. These procedures shall be applied when calculating the fuel use for the CORSIA.

For A321 and A21N aircraft (operated by Alpha Airlines): in accordance with Alpha Airlines' operations manual, the actual fuel density provided by the fuel supplier will be used. In case where actual fuel density is not available, a standard density of 0.8 kg/l will be used.

For E190 aircraft (operated by Bravo Air): in accordance, with Bravo Air's operations manual, a standard density of 0.8 kg/l will be used in all instances.

4.6 ICAO CORSIA CO₂ ESTIMATION AND REPORTING TOOL (CERT)

(Annex 16, Volume IV, Appendix 3)

a) Description of relevant input data

Please specify whether Great Circle Distance and/or Block Time is used as input into the ICAO CORSIA CERT. If applicable, please specify the procedures for determining Block Time and potentially aggregating them to be used in the ICAO CORSIA CERT. This includes specifying the exact points in time for the two time measurements per flight necessary to calculate the Block Time.

Great circle distance will be used.

5. DATA MANAGEMENT, DATA FLOW, CONTROL SYSTEM, RISK ANALYSIS AND DATA GAPS

(Annex 16, Volume IV, Appendix 4, 2.4)

a) Description of data management

Please provide a description of each step in the data flow and data processing, including controls to assure data quality, beginning with the source data up to the Emissions Report. Please reference the responsible departments. Please attach a data flow chart to the Emissions Monitoring Plan summarizing the systems used to record, store and control the quality of data associated with the monitoring and reporting of emissions.

Data is recorded by flight crews for all flights in technical logs. Copies of technical logs will be provided to and kept by the Flight Operations Department. For aircraft equipped with ACARS, the data will also be transmitted automatically via ACARS to the Flight Operations Department. Fuel slips are collected by the Financial Services department, with copies provided to the Flight Operations Department.

The Flight Operations Department will be responsible for entering all data received in the dedicated database and conduct daily integrity checks. The integrity checks will allow to identify situations where secondary sources need to be used or where data gaps occur.

After the integrity checks, the consolidated data will be sent to the Environment Department on a weekly basis. The Environment department verify that all flights subject to CORSIA are properly identified as such (and flights not subject to CORSIA excluded). Data gaps will be filled automatically by the dedicated CORSIA IT tool. The data will be kept in a dedicated database and will be compiled on an annual basis for the emissions report.

b) Threshold for data gaps

If employing a Fuel Use Monitoring Method, please provide a description of the systems and procedures for identifying data gaps and for assessing whether the 5 per cent threshold for significant data gaps has been reached (in accordance with Annex 16, Volume IV, Part II, Chapter 2, 2.5.1).

Daily data integrity verification checks will be performed in the flight operations department. The data will be checked for blank fields, but also for erroneous data. Potential erroneous data will be identified by comparing data with average data for the same aerodrome-pairs or for similar flights.

In cases of blank or erroneous data fields, the flight operations department will look into the availability of secondary sources and seek to identify the origin of the data gap.

At the end of each year, the number of flights affected by data gaps will be compared to the total number of international flights to assess whether they exceed the 5% threshold.

b1) Description of available secondary sources

Please specify data sources that can be alternatively used for reporting purposes.

Where fuel measurements are transmitted by ACARS are used as primary data sources, technical log books will be used as secondary sources where required.

b2) Handling of data gaps and erroneous data values

Aeroplane operators using a Fuel Use Monitoring Method shall use the ICAO CORSIA CO₂ Estimation and Reporting Tool (CERT) to fill data gaps, in accordance with Annex 16, Volume IV, Part II, Chapter 2, 2.5.1, where the secondary data sources listed above are not available. For aeroplane operators not using a Fuel Use Monitoring Method, please provide a description of the method that will be used to fill data gaps in the event a secondary data reference source listed above is not available.

As an equivalent procedure to using the downloadable CERT version, all data gaps will be filled using the CO2 Estimation Models published by ICAO (CEMs). The CEMs published by ICAO will be implemented in Alpha Airlines' IT system and will be updated whenever a new version is made available by ICAO to ensure that the results of implementing the CEMs in our system are identical to those obtained with the same input from the downloadable CERT version.

b3) Data gaps despite secondary sources

Does the existing data management system allow for data gaps when secondary data sources exist?

yes

b4) Explanations of data gaps for which existing secondary sources cannot be used

Please describe the conditions (e.g., cost, time to resolve, data availability, data quality) under which this occurs.

In cases of missing primary data for flights operated by Air Delta on behalf of Alpha Airlines, the technical logs will be too complicated and timely to retrieve from Air Delta to be used as secondary sources.

c) Documentation and record keeping plan

Please specify where process directives are stored. Please indicate the IT system used, if applicable. List of applied data management and IT standards, where relevant.

In addition to its operational databases, Alpha Airlines has developed a dedicated IT tool for CORSIA. The dedicated tool will store fuel and flight data and automatically sort flights by state-pair, while identifying flights which are not subject to MRV requirements. All databases are stored both onsite and offsite.

Archived off-site electronic records are kept for 10 years. Fuel Slips and technical log manual entries are kept for 24 months, and flight crew records are kept for 3 years, within which period it is expected that gaps will have been filled.

d) Explanation of risks

Data management systems and controls are critical for ensuring data completeness, security, quality and minimizing the risk of a material error or misstatement in the emissions report. Please provide a list of the risks associated with the data management system and the corresponding internal or external control activity(ies) for addressing each.

All manual entry systems include inherent risks of incorrect data entry. These risks will be addressed through daily data integrity verification checks.

Risk of loss of data (corruption/significant loss) will be managed through off site storage of back-up data.

e) Revisions of Emissions Monitoring Plan

Please provide information on procedures for identifying: i) material changes to the Emissions Monitoring Plan requiring revision and resubmission to the State and ii) non-material changes to the Emissions Monitoring Plan for disclosure in the Emissions Report.

Non-material changes will be communicated to the administrating authority on an annual basis as appendixes to the emissions report.

In case any material changes are required, the environment team will revise the emissions monitoring plan and submit it to the administrating authority for approval of the amendment(s).

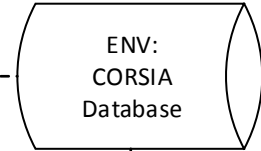
BravoAir



ACARS



AIRDELTA



Data Validation

- Completeness
- Integrity

Exclusion

- Domestic
- Humanitarian

Data Gaps filled with CEMs

Sorting

- State-Pair
- Offsetting



CORSIA Report

