

# CHARLIE AIRWAYS

## CORSIA EMISSIONS MONITORING PLAN SAMPLE

In order to prepare for the monitoring, reporting and verification (MRV) of CO<sub>2</sub> 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 administering 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 administering 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 administering 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 administering 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](mailto:corsia@iata.org).

# CORSIA

## EMISSIONS MONITORING PLAN (EMP)

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### 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.*

1
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**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	2018-09-12	2019-01-01	New EMP

## 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.

Charlie Airways
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### b) Address of the aeroplane operator

Please enter the address of the aeroplane operator.

Address line:	800 rue du Square-Victoria
City:	Montreal
State/Province/Region:	QC
Postcode/ZIP:	H4Z1M1
Country:	Canada

### 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:	Olivia
Surname:	Gagnon
Email address:	o-gagnon@charlie-airways.ca
Telephone number:	+14381234567
Address line 1:	800 rue du Square-Victoria
Address line 2:	
City:	Montreal
State/Province/Region:	QC
Postcode/ZIP:	H4Z1M1
Country:	Canada

### 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 and registration marks
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### d1) Responsibility under the CORSIA

Aeroplane operator that has been assigned the ICAO Designator and holds the AOC (or equivalent)
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### 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).

CHA
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**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	VQ-BUZ	11		21	
2	VQ-MBM	12		22	
3	M-JETS	13		23	
4	M-JETZ	14		24	
5	N12324	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.

In addition to its ordinary operations (performed with the "CHA" designator), Charlie Airways provides aircraft management services to owners of private aircraft. While these flights are operated by Charlie Airways under their AOC, they are not performed using the Charlie Airways ICAO Designator.

**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".

44441

**e2) Date of issue**

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

2016-10-05

**e3) Date of expiry**

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

2035-12-31

**e4) Competent authority for the AOC**

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

Name of the authority:	Transport Canada
Address line:	
City:	Ottawa
State/Province/Region:	ON
Postcode/ZIP:	
Country:	Canada

**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?

This AOC authorizes Charlie Airways to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual and the national civil aviation regulations. The AOC also authorizes Charlie Airways to provide aircraft management services.

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.*

Charlie Airways' shares are split between public and private shareholders. Charlie Airways holds 49% of the shares in Alpha Airlines, an airline based in Geneva.

**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?*

no

**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)

**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.*

**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.*

**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.*

**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.*

Charlie Airways performs scheduled passenger flights to North America, the Caribbean and South America. In addition, it operates occasional charter flights, which include diplomatic missions and military transport on behalf of the Canadian Government. Charlie Airways also performs flights and other aircraft management services for private owners of aircraft. Charlie Airways also operates flights under a wet-lease agreement on behalf of an operator called Echo. Echo's ICAO designator is used for all flights, with the exception of ferry flights between Miami and Charlie Airways' base in Montreal, Canada.

**h) Contact person**

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

Title:	Mr
First name:	Thomas
Surname:	Lavoie
Email address:	t-lavoie@charlie-airways.ca
Telephone number:	+14381234567
Address line 1:	800 rue du Square-Victoria
Address line 2:	
City:	Montreal
State/Province/Region:	QC
Postcode/ZIP:	H4Z1M1
Country:	Canada

**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:	Catherine
Surname:	Drummont
Email address:	c-drummont@charlie-airways.ca
Telephone number:	+14381234567
Address line 1:	800 rue du Square-Victoria
Address line 2:	
City:	Montreal
State/Province/Region:	QC
Postcode/ZIP:	H4Z1M1
Country:	Canada

### 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	A319	Jet-A	2
2	B763	Jet-A	10
3	B788	Jet-A	2
4	DH8C	Jet-A	2
5	B737	Jet-A	4
6	F900	Jet-A	1
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			
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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
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**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	Flight operations department
Description of procedure	The fuel procurement team will inform the Environment department prior to the delivery of any new aircraft when it orders fuel for the delivery flight. Aircraft retirements will be notified by the flight operations center to the Environment team.
Location of records	Flight operations 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	Operations control
Description of procedure	Flight crews will record flight data into technical logs. These technical logs are generated electronically using an electronic flight bag and reports are sent by wifi to the company data servers upon the completion of each flight. Technical log reports are reconciled against operational flight plans and published schedules by the Flight operations department. Any missing or potentially erroneous data are investigated. The Director Operations Control is responsible for the integrity of the operations database and to ensure that all required flight reports and records are received and logged.
Location of records	Operations control 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	Colombia	Canada
2	Brasil	Canada
3	Chile	Canada
4	France	Canada
5	Peru	Canada
6	United States of America	Canada
7	Canada	Colombia
8	Canada	Brasil
9	Canada	Chile
10	Canada	France
11	Canada	Peru
12	Canada	United States of America
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**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	Charlie Airways will use FRED+ to manage CORSIA data. FRED+ will automatically identify flights between ICAO member States and exclude domestic flights. Scheduled updates of FRED+ will ensure the accuracy of the underlying data and its alignment with 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 CO<sub>2</sub> 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	Charlie Airways will use FRED+ to manage CORSIA data. FRED+ will automatically identify flights which are subject to offsetting requirements. Scheduled updates of FRED+ will ensure the accuracy of the underlying data.
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	Environment department and Flight operations
Description of procedure	Charlie Airways will use FRED+ to manage CORSIA data. FRED+ will automatically identify flights which are domestic and exclude them from the emissions report.  Flights operated by DH6C aircraft and State flights will be filtered out from the data extracted by the flight operations department prior to their input into FRED+.  State flights are systematically identified through the information in the flight plan. If Item 18 of the flight plan is marked "HEAD", then the flight is considered to be a flight with Head of State status. Other state flights, such as customs and police services, will use the indicator "STATE" in Item 18. These flights will filtered out from the data extracted by the flight operations department prior to their input into FRED+.
Location of records	Environment 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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	A319, B788, B763	yes	yes
Method B			
Block-off / Block-on	DH8C, B737, F900	yes	yes
Fuel Uplift			
Fuel Allocation with Block Hour			

### c) Simplified monitoring method

Please provide information on use of the ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT)

2019-2020 period	2021-2035 period

### c1) Estimated annual CO<sub>2</sub> emissions

Please demonstrate the eligibility to use the ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT) by providing an estimate of fuel use in order to calculate an estimate of the total CO<sub>2</sub> 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 CO<sub>2</sub> 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 <sub>2</sub> 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 CO<sub>2</sub> 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.*

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**c3) Input method for reporting**

*Please specify for the ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT) whether Great Circle Distance or Block Time is used to estimate emissions for the reporting periods.*

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**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 CO<sub>2</sub> emissions for the parent and subsidiary (or subsidiaries).*

Not applicable

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## 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.*

Flight crews will measure the mass of fuel in tanks using the Fuel Quantity Indicators (FQI) of the aircraft right before and after the fuel loading occurs. The following measurements will be used for method A:

- Fuel quantity right after the completion of the fuel loading. In cases where no uplift takes place for a flight, the amount of fuel contained in the tanks at block-off will be used. In cases where a flight is followed by an activity other than a flight, such as maintenance, the measurement of fuel remaining in tanks at block-on (after the previous flight) will be used. Block-on fuel is measured when the last engine is shut off.
- Fuel uplift measured as the difference in mass in tank, as indicated by the FQIs, right before and after the fuel loading occurs (primary source). The measurement will be cross-checked with the fuel split received from the fuel supplier (secondary source).

The measurements will be logged by flight crews in the technical log. Fuel slips are scanned and sent to the 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.*

The mass of fuel given by the Fuel Quantity Indicators of aircraft are calculated based on actual density (using densitometers).

Fuel density will only be required in situations where fuel uplifts are determined on the basis of fuel uplifts. In accordance with the operations manual of Charlie Airways, a standard density of 0.80 kg/l is used for all flights, except for weight critical operations where pilots are required to use actual fuel density.

## 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.*

Not applicable

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### 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

### 4.3 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.*

Blocks-on is immediately when last engine is shut off. This will be the exact time point for recording the Blocks-on fuel level.

Blocks-off is when the last door is closed. This is the exact point when blocks off fuel is recorded.

Pilots will read the fuel measurements from the aircraft fuel quantity indicators and record the measurements in the technical log.



## 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

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### b) Fuel uplift

*Please specify which fuel uplift record will be used.*

Not applicable

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### 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 <sup>st</sup> 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.	Not applicable
<input type="checkbox"/>	2 <sup>nd</sup> Option for aeroplane operators which cannot clearly distinguish between international and national fuel uplifts on a flight by flight basis.	Not applicable

### 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.

Not applicable

### c) Fuel uplift

Please specify which fuel uplift record will be used.

Not applicable

### 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.

Not applicable


## 4.6 ICAO CORSIA CO<sub>2</sub> 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.



## 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.*

Flight data will be recorded in the Technical Log on the aircraft. These technical logs are generated electronically using an electronic flight bag. Reports are sent by wifi to the company data servers upon the completion of each flight.

Technical log reports are reconciled against operational flight plans and published schedules by the Flight operations department. Any missing or potentially erroneous data are investigated.

The data required for CORSIA is extracted as a csv file, after removal of all flights performed with our DH6C fleet and state flights. The data is input in FRED+, which will automatically fill data gaps using the CEMs and produce the emissions report for CORSIA.

### 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).*

The Operations Control Center will validate the data collected from technical logs. If any data gaps are identified, the fields will be left blank. When the data will be input into FRED+, data gaps will be flagged in the system and the percentage of flights subject to data gaps provided.

### b1) Description of available secondary sources

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

For fuel uplift measurements, fuel slips will be used as secondary sources.

**b2) Handling of data gaps and erroneous data values**

*Aeroplane operators using a Fuel Use Monitoring Method shall use the ICAO CORSIA CO<sub>2</sub> 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.*

Data gaps will be filled by the FRED+ system. The ICAO CO<sub>2</sub> Estimation models are integrated in the FRED+ system and will be updated on a regular basis to ensure they are the latest ones published by ICAO and that the results of implementing the CEMs in IT systems are identical to those obtained with the same input from the downloadable CERT version.

If data gaps exceed 5%, we will engage with the authority to identify remedial action. Potential remedial action could be to determine fuel use using the fuel uplift method as detailed records of fuel uplifts and block time for all flights are kept in the operations control database.

**b3) Data gaps despite secondary sources**

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

no

**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.*

**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.*

Our Operations Control department maintains a database with all technical logs for flights performed by Charlie Airways. Charlie Airways' data management is certified against ISO 27001 standards.

In addition, data required for CORSIA emissions reports will be stored in FRED+ and hosted on Amazon web services.

**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.*

The main risk associated with our data management processes are inaccurate data input into the electronic flight bags. Potential errors will be identified automatically by our database using statistical data for validation.

The data stored on our servers is also stored on a cloud.

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**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.*

The environment department will maintain updated lists of all state pairs and aircraft operated by Charlie Airways. The lists will be appended to the annual emissions reports.

If any changes in systems or processes that may affect the reliability/accuracy of our monitoring occur, the environment department will contact the authority to determine whether they constitute material changes which require an amendment to the emissions monitoring plan.

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