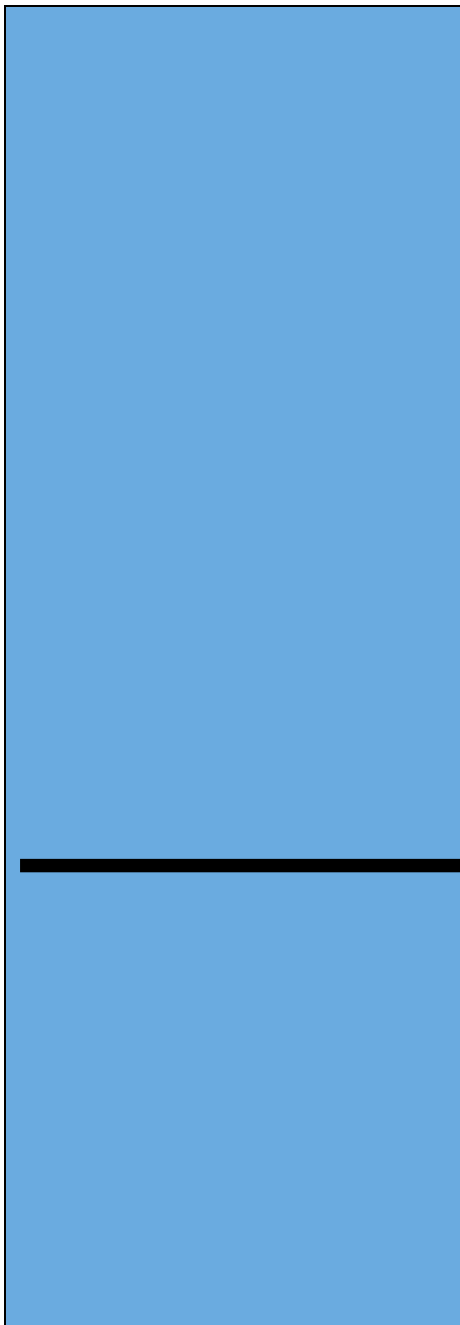




REPUBLIC OF MAURITIUS

**DEPARTMENT OF CIVIL AVIATION**

Sir Seewoosagur Ramgoolam International Airport, Plaine Magnien



**MCAR**

**AVIATION**

**ENVIRONMENT PROTECTION**

**CARBON OFFSETTING AND REDUCTION  
SCHEME FOR INTERNATIONAL AVIATION.  
(CORSIA)**

# DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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## FOREWORD

These requirements have been issued under the provisions of Regulation 135 of the Civil Aviation Regulations 2007 as amended, which empower the Director of Civil Aviation to promulgate Civil Aviation Requirements and procedures not inconsistent with the Civil Aviation Regulations 2007 as amended to implement Requirements and procedures made thereunder to carry out the provisions of the Chicago Convention and any Annex thereto. This Mauritius Civil Aviation Requirements (MCAR) is issued in compliance with the Civil Aviation Act and Civil Aviation Regulations.

This MCAR stipulates the general requirements, procedures and practices to be adhered to by all stakeholders/organizations that are engaged in international operations which directly or indirectly impact climate change. The objective of this MCAR is to manage the adverse impact of aviation activities on the atmosphere leading to sustainable growth of the industry by offsetting the carbon emissions generated due to international operations of their flights. With the objective of compliance with the above mentioned rules, MCAR, AVIATION ENVIRONMENT has been developed based on the International Standards and Recommended Practices (SARPs) contained in ICAO Annex-16, Volume-IV.

This MCAR is issued under the provisions of Regulations 135 of the Civil Aviation Regulations 2007 as amended, for information, guidance and compliance by all such organizations who operates flights to international destinations or intend to operate flights to such international destinations in future under the provisions mentioned in this MCAR.

The requirements contained in this MCAR are in-line with the requirements as mentioned in ICAO Annex-16, Volume-IV. It prescribes applicability, monitoring, reporting and verification (MRV) of aeroplane operator annual CO<sub>2</sub> emissions, CO<sub>2</sub> offsetting requirements from international flights, emissions reductions from the use of sustainable aviation fuels, requirements for verification and verification bodies, purchase and cancellation of emissions units, and compliance procedure to the above requirements.



I POKHUN

**Director of Civil Aviation**

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**TABLE OF CONTENTS**

<b>Foreword</b> .....	<b>2</b>
<b>Table of Contents</b> .....	<b>3</b>
<b>Record of Revision</b> .....	<b>5</b>
<b>Chapter 1 INTRODUCTION.</b> .....	<b>6</b>
1.0 Introduction to Carbon Offsetting and Reduction Scheme for International Aviation: .....	6
2.0 CORSIA Design Elements .....	6
<b>Chapter 2 ADMINISTRATION</b> .....	<b>10</b>
1.0 Attribution of international flights to an aeroplane operator: .....	10
2.0 Attribution of an aeroplane operator to a State:.....	10
3.0 CORSIA Focal Point:.....	11
4.0 Record Keeping:.....	11
5.0 Compliance Periods and Timeline:.....	11
6.0 Equivalent Procedures: Reserved. ....	11
7.0 Oversight by THE AUTHORITY .....	11
<b>Chapter 3 MONITORING, REPORTING AND VERIFICATION (MRV) OF AEROPLANE OPERATOR ANNUAL CO<sub>2</sub> EMISSIONS.</b> .....	<b>13</b>
1.0 Applicability of MRV Requirements: .....	13
2.0 Monitoring of CO <sub>2</sub> Emissions:.....	14
3.0 Emissions Monitoring Plan (EMP): .....	15
4.0 Calculation of CO <sub>2</sub> emissions from aeroplane fuel use: .....	16
5.0 Monitoring of CORSIA eligible fuels claims: .....	16
6.0 Reporting of CO <sub>2</sub> emissions:.....	17
7.0 Verification of CO <sub>2</sub> emissions:.....	19
8.0 Data gaps .....	19
<b>Chapter 4 CHAPTER 4 CO<sub>2</sub> OFFSETTING REQUIREMENTS FROM INTERNATIONAL FLIGHTS.</b> .....	<b>21</b>
1.0 Applicability of CO <sub>2</sub> offsetting requirements: .....	21
2.0 CO <sub>2</sub> offsetting requirements: .....	21
<b>Chapter 5 EMISSIONS REDUCTIONS FROM THE USE OF SUSTAINABLE AVIATION FUELS.</b> .....	<b>24</b>
1.0 Emissions reductions from the use of sustainable aviation fuels:.....	24
2.0 Total final CO <sub>2</sub> offsetting requirements for a given compliance period with emissions reductions from the use of CORSIA eligible fuels: .....	24
<b>Chapter 6 EMISSIONS UNITS.</b> .....	<b>26</b>

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

1.0	Applicability of Emissions Units .....	26
2.0	Cancelling CORSIA Eligible Emissions Units: .....	26
3.0	Reporting emissions unit cancellation: .....	27
4.0	Verification of an Aeroplane Operator’s Emissions Unit Cancellation Report..	27
<b>Chapter 7</b>	<b>VERIFICATION BODY AND NATIONAL ACCREDITATION BODY .....</b>	<b>29</b>
1.0	Verification Body and National Accreditation Body:.....	29
<b>APPENDIX ONE</b>	.....	<b>30</b>
<b>APPENDIX TWO - ABBREVIATIONS AND UNITS</b>	.....	<b>33</b>
<b>APPENDIX THREE - ICAO Assembly Resolution A39-3</b>	.....	<b>34</b>
<b>APPENDIX FOUR – Emissions Monitoring Plan (EMP)</b>	.....	<b>40</b>

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

**Record of Revision**

This MCAR has been issued to formulate regulations towards MRV and offsetting requirements for all aeroplane operators based on International Civil Aviation Organization's International Standards and Recommended Practices (SARPs) as contained in Annex-16, Environmental Protection, Volume-IV "Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)". The MCAR has been developed in line with the first edition of the offsetting requirements as proposed by Committee on Aviation Environmental Protection (CAEP) based on the deliberations held in various meetings and their final recommendations contained in the above ICAO Annex. The Record of Revisions to the aforesaid MCAR will be mentioned as follows:

<b>SN</b>	<b>Issue No.</b>	<b>Revision No</b>	<b>Date</b>	<b>Remarks</b>
1.	Issue 1	Revision 0	10 Dec 2018	Initial issue of MCAR to adopt monitoring, reporting and verification (MRV) and offsetting requirements as contained in Annex-16, Volume-IV.

# DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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## CHAPTER 1 INTRODUCTION.

### 1.0 Introduction to Carbon Offsetting and Reduction Scheme for International Aviation:

1.1 The 39<sup>th</sup> ICAO General Assembly, held in October 2016, concluded with the adoption of a global market-based measure scheme to address CO<sub>2</sub> emissions from international aviation, known as “Carbon Offsetting & Reduction Scheme for International Aviation (CORSIA)” which was approved by ICAO Council on 27th June, 2018. This market-based measure was adopted based on ICAO’s aspirational goal of Carbon Neutral Growth beyond 2020

1.2 In 2010, ICAO set three aspirational goals to address its climate impact:

- (i) An annual improvement of 2% in fuel efficiency from 2009 until 2020,
- (ii) To achieve Carbon Neutral Growth from 2020 to stabilize the net CO<sub>2</sub> emissions, and
- (iii) Reduction of carbon emissions by 50% by 2050 compared to 2005 levels.

1.3 Under CORSIA, aeroplane operators are required to purchase and cancel “emissions units” to offset the increase in CO<sub>2</sub> emissions covered by the scheme. With the exceptions of humanitarian, medical and fire-fighting flights, all civilian international operations undertaken by aeroplane operators are covered by CORSIA. CORSIA aims to address any annual increase in total CO<sub>2</sub> emissions from international civil aviation above the baseline value (based on the average of 2019 and 2020 emissions levels) in order to avoid the impact of any unusual fluctuations in air traffic in 2020 levels.

### 2.0 CORSIA Design Elements

2.1 CORSIA scheme has mainly two design elements, viz., Monitoring, Reporting & Verification (MRV) and Offsetting. MRV is a system to capture fuel consumptions from international operations by an operator and, to calculate the carbon emissions thereon for reporting to the Authority annually. Whereas, in offsetting, an operator is required to offset its carbon emissions from its international operations which is due to increase in emissions levels compare to the baseline emissions value.

2.2 Monitoring, Reporting & Verification (MRV): One of the main features of CORSIA is MRV system:

- (i) Monitoring of fuel use on each international flight and calculation of CO<sub>2</sub> emissions,

## DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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(ii) Reporting of CO<sub>2</sub> emissions information between aeroplane operators, the Authority and ICAO, and

(iii) Verification of reported emissions data to ensure completeness and to avoid misstatements.

2.3 The foremost requirement under this scheme is to monitor, verify and report the fuel consumptions and emissions data from international routes. All operators, who are engaged in international operations, have to capture their fuel consumption and carbon emissions data annually, starting from 1st January, 2019 every year. Requirement for the MRV of CO<sub>2</sub> emissions is independent from participation in CORSIA offsetting. The emissions data calculated from fuel used on international routes by all operators globally for the year 2019 and 2020 will be used exclusively by ICAO to calculate the baseline emissions value which will be used in the subsequent years for calculation of growth in emissions levels for calculation of offsetting requirements. Offsetting Requirements: While the reporting of emissions will take place on an annual basis, offsetting requirements will be aggregated by 3-year compliance period. For every compliance cycle, operators will need to offset and cancel a quantity of eligible emissions units corresponding to their offsetting requirements. The Authority will notify operators of their final offsetting requirements for each 3-year period by 30<sup>th</sup> November of the following year. Operators will, however, also be informed on an annual basis (also by 30<sup>th</sup> November) of the provisional offsetting requirements associated with each individual compliance year.

2.5 Compliance Period:

The offsetting requirements need to be fulfilled by the operators during each compliance period which is of three years' duration. There are five, 3-year compliance periods, as follows, starting from 2021:

(i) 2021-2023: Pilot phase,

(ii) 2024-2026: First phase, and

(iii) 2027-2029, 2030-2032, 2032-2035: Second phase.

2.6 Allocation of Offsetting Requirements:

The allocation of offsetting requirements will evolve over time from a "sectoral" approach to a combination of a "sectoral" and an "individual" component. The sectoral component is based on the total CO<sub>2</sub> emissions of each operator. Each operator will have to offset a given percentage of its CO<sub>2</sub> emissions from flights subject to offsetting requirements. This percentage, the sector's "growth factor",

## **DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS**

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will be the same for all operators and refers to the increase in CO<sub>2</sub> emissions divided by the total CO<sub>2</sub> emissions on routes covered by CORSIA in a given year.

### 2.7 Phased Implementation:

In order to address the concerns of developing states and to take into account the special circumstances and respective capabilities of states, CORSIA will be implemented in phases. The phased implementation, however, only relates to offsetting requirements.

### 2.8 Pilot Phase (2021-2023) and First Phase (2024-2026):

The Pilot and First phases are voluntary in nature and will apply to only those states that opt to participate in these phases. From 2021 until 2026, offsetting requirements will only apply to international flights between states that volunteer to participate in the pilot and/or first phase. Any operator flying between volunteering states will be subject to offsetting requirements, irrespective of participation of their State in the voluntary phases. All other international flights to and from states that have not volunteered; will be exempt from offsetting requirements.

### 2.9 Second Phase (2027 – 2035):

The Second phase is mandatory in nature and will apply to all those states who meets the RTK criteria or the exempted states who volunteers to participate in the scheme. From 2027, offsetting requirements will apply to all international flights including those that did not volunteer to be part of the pilot/first phases.

### 2.10 The Second Phase of CORSIA applies to all ICAO Member States except to those States that meet the following aviation-related criteria:

- (I) States with individual share of international aviation activities in Revenue Tonne Kilo meters (RTKs), in year 2018 below 0.5 per cent of total RTKs, and
- (ii) States that are not part of the list of States that account for 90 per cent of total RTKs when sorted from the highest to the lowest amount of individual RTKs.

### 2.11 Voluntary Participation:

States who wish to participate in CORSIA voluntarily, can decide to join the scheme at the beginning of any year, however, they shall communicate their



## DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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decision to ICAO before 30th June of the preceding year. States who decide to participate in CORSIA on a voluntary basis may discontinue their voluntary participation from the scheme from 1st January of any given year, provided they inform ICAO not later than 30th June of the preceding year. The list of such participating States will be published on ICAO website who intend to voluntarily participate in CORSIA from its outset.

### 2.12 Route-based Approach:

CORSIA shall apply to all international flights on the routes between two States participating in the CORSIA for offsetting requirements, in order to have complete emissions coverage and to minimizing market distortion.

# DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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## CHAPTER 2 ADMINISTRATION.

### 1.0 Attribution of international flights to an aeroplane operator:

- 1.1 As the scheme is applicable to international flights only, as a first step, all aeroplane operators have to identify their flights operating on international routes. For the purposes of this MCAR, two or more consecutive international flights, operated under the same flight number, are considered as separate flights.
- 1.2 The aeroplane operators shall either use ICAO Designator or Registration Marks to determine the attribution of such international flights. In case, an international flight could not be identified based on its ICAO Designator or Registration Mark, that flight shall be attributed to the owner of the aeroplane.
- 1.3 The aeroplane operators shall provide a list of such identified international flights along with proper evidence of such identification to the Authority. The Authority shall perform the required order of magnitude checks to ensure correct attribution of all international flights to the respective aeroplane operators, if required.

### 2.0 Attribution of an aeroplane operator to a State:

- 2.1 The aeroplane operator shall also ensure correct attribution towards the State to which the aeroplane operator fulfils its operational requirements by using either ICAO Designator Air Operator Certificate (AOC). In case, an aeroplane operator does not possess an ICAO Designator or Air Operator Certificate, the State where the aeroplane operator is registered as juridical person or reside, shall be considered for its attribution purpose.
- 2.2 In case, the aeroplane operator changes its ICAO Designator, AOC or place of juridical registration/residence and is subsequently attributed to a new State, but it is not establishing a new entity or a subsidiary, then the new State shall become the State to which the aeroplane operator fulfils its requirements under this MCAR at the start of the next compliance period. Till such time, the aeroplane operator shall demonstrate compliance with the requirements of this MCAR only.
- 2.3 The aeroplane operator with a wholly owned subsidiary aeroplane operator that is legally registered with the Authority, can submit a request to the Authority for treating both the operators as a single entity for demonstrating compliance with the requirements of this MCAR. The Authority may consider their request provided the aeroplane operator submits substantiation documents to demonstrate that the subsidiary aeroplane operator is wholly owned by the parent organization.

# DEPARTMENT OF CIVIL AVIATION

## REPUBLIC OF MAURITIUS

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### **3.0 CORSIA Focal Point:**

- 3.1 The aeroplane operator shall designate a Focal Point in their respective organizations duly approved by their management. Names and Contact details of such Focal Points shall be submitted to the Authority for approval.
- 3.2 The Focal Point should possess sound knowledge of CORSIA and related environmental protection matters.
- 3.3 The Focal Point shall act as the contact person for the Authority for all CORSIA related issues and shall be responsible for submission of all data, information, reports as and when required under CORSIA. The Focal Point shall be also responsible for demonstrating compliance to the requirements contained in this MCAR.

### **4.0 Record Keeping:**

- 4.1 The aeroplane operator, responsible for demonstrating compliance to the requirements contained in this MCAR, shall maintain all relevant records pertaining to their fuel consumption and corresponding emissions data for at least 15 years.
- 4.2 The aeroplane operator should also maintain and keep all records relevant to its CO<sub>2</sub> emissions per State and Aerodrome pair submitted to the Authority for the 2019- 2020 period for the purpose of calculating its offsetting requirements during the 2030-2035 compliance periods.

### **5.0 Compliance Periods and Timeline:**

- 5.1 The aeroplane operators shall comply with the requirements as contained in this MCAR and shall adhere strictly with the timeline provided by the Authority from time to time.

### **6.0 Equivalent Procedures: Reserved.**

### **7.0 Oversight by THE AUTHORITY**

- 7.1 The Authority may carry out oversight of the aeroplane operators regarding their correct attribution to the State and international flights, annual fuel and emissions related data from international operations, Emissions Monitoring Plan, Annual Emissions Report, Emissions Unit Cancellation Report, data management, data

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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gaps and record keeping, as and when required. The Authority may, at any time, ask for additional substantiation data from the aeroplane operators in this regard.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**CHAPTER 3      MONITORING, REPORTING AND VERIFICATION  
(MRV) OF AEROPLANE OPERATOR ANNUAL CO<sub>2</sub> EMISSIONS.**

**1.0      Applicability of MRV Requirements:**

- 1.1      The requirements of this chapter shall be applicable to all aeroplane operators including scheduled operators, non-scheduled operators and those operating under general aviation that produces annual CO<sub>2</sub> emissions greater than 10,000 tonnes from international operations using an aeroplane(s) with a maximum certificated take-off mass greater than 5,700 kg, on or after 1st January 2019 onwards.
  
- 1.2      The requirements of this chapter shall not apply to those aeroplane operator whose annual CO<sub>2</sub> emissions from international flights, is less than 10,000 tonnes. However, in order to monitor their annual emissions from international flights, the aeroplane operator shall submit relevant data pertaining to their fuel consumption from international operations to the Authority on annual basis as per the template provided by the Authority.
  
- 1.3      The requirements of his chapter shall not apply to international flights, preceding or following, a humanitarian, medical or fire-fighting flight provided such flights were conducted with the same aeroplane and were required to accomplish the related humanitarian, medical or fire-fighting activities or to reposition thereafter the aeroplane for its next activity.
  
- 1.4      The aeroplane operator shall have to provide enough supporting evidence of such flights to the Authority and the verification body for verification purpose, in order to consider these flights exempted under MRV requirements.
  
- 1.5      The requirements of this chapter shall be also applicable to an aeroplane operator who starts its international operations after 1st January, 2019 (i.e., a New Entrant). However, a new entrant will be liable for monitoring, reporting and verification requirements from the 1st January of the next year after its annual CO<sub>2</sub> emissions from international operations exceeds 10,000 tonnes in the preceding year.
  
- 1.6      Aeroplane operator whose annual CO<sub>2</sub> emissions value is very close to the threshold value of 10,000 tonnes CO<sub>2</sub> emissions from international flights, should approach the Authority for further necessary guidance for demonstrating compliance to the aforesaid requirements.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**2.0 Monitoring of CO<sub>2</sub> Emissions:**

- 2.1 As a part of requirements, all aeroplane operators shall monitor their annual fuel consumption and emissions data from international operations from 1st January, 2019 onwards. For the monitoring purposes, the aeroplane operator has to establish a monitoring procedure and shall be properly document it in their Emissions Monitoring Plan (EMP) with reference to their internal document. The Emissions Monitoring Plan (EMP) containing necessary information about the monitoring and reporting about the fuel used and corresponding emissions data from all international flights, shall be submitted to the Authority for approval.
- 2.2 For the details of the information to be contained in the Emission Monitoring Plan, all aeroplane operators shall use the template developed by the Authority for preparing their EMP. The EMP shall be approved by the Authority and the aeroplane operators shall strictly follow the monitoring procedure as mentioned in their approved EMP.
- 2.3 The aeroplane operators whose annual carbon emissions is less than 10,000 tonnes, shall establish a simplified procedure to monitor their fuel consumption data from international operations and shall use a simplified EMP provided by the Authority and shall continue using the same template till their CO<sub>2</sub> emissions exceeds the threshold value of 10,000 tonnes annually.
- 2.4 For 2019-2020 period: The aeroplane operator with annual CO<sub>2</sub> emissions from international flights, greater than or equal to 500,000 tonnes shall use a Fuel Use Monitoring Method as prescribed in Chapter-1 of this MCAR.
- 2.5 The aeroplane operator with annual CO<sub>2</sub> emissions from international flights, less than 500,000 tonnes shall either use a Fuel Use Monitoring Method or the ICAO CORSIA CO<sub>2</sub> Estimation and Reporting Tool (CERT) which is described in Chapter-2 of this MCAR.
- 2.6 However, if the annual CO<sub>2</sub> emissions increases above the threshold of 500,000 tonnes during 2019, the Authority may allow the operator to continue with the use of CERT for 2020 also, based on a written request from the aeroplane operator.
- 2.7 The aeroplane operator should use the same monitoring method during the 2019-2020 period that it expects to use during the 2021-2023 period, taking into account the projected annual CO<sub>2</sub> emissions for the period 2021-2023. In case, the aeroplane operator desires to change its monitoring method, it will submit a revised Emissions Monitoring Plan to the Authority by 30<sup>th</sup> September 2020 in order to implement the new monitoring method from 1<sup>st</sup> January 2021 onward.

**DEPARTMENT OF CIVIL AVIATION**  
**REPUBLIC OF MAURITIUS**

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- 2.8 In case, the aeroplane operator's Emissions Monitoring Plan is found to be incomplete and/or inconsistent with the eligible Fuel Use Monitoring Method, the Authority shall direct the aeroplane operator to resubmit the Emissions Monitoring Plan by amending the EMP with correct information.
- 2.9 the Authority may allow the operator to use CERT till 30<sup>th</sup> June 2019, in case, the aeroplane operator does not have sufficient information to select an appropriate Fuel Use Monitoring Method. However, the aeroplane operator shall submit an Emissions Monitoring Plan to the Authority within 30<sup>th</sup> June, 2019.
- 2.10 For 2021-2035 period: The aeroplane operator, with annual CO<sub>2</sub> emissions from international flights subject to offsetting requirements, greater than or equal to 50,000 tonnes, shall use a Fuel Use Monitoring Method for those flights. However, for international flights not subjected to offsetting requirements, the aeroplane operator shall either use a Fuel Use Monitoring Method or CERT.
- 2.11 The aeroplane operator, with annual CO<sub>2</sub> emissions from international flights subject to offsetting requirements, less than 50,000 tonnes, shall either use a Fuel Use Monitoring Method or CERT. However, if the aeroplane operator's annual CO<sub>2</sub> emissions from international flights subject to offsetting requirements, increases above the threshold of 50,000 tonnes in two consecutive years, the aeroplane operator shall submit a revised Emissions Monitoring Plan to the Authority by 30<sup>th</sup> September of the third year by indicating an appropriate Fuel Use Monitoring Method to be used from on 1st January of the fourth year onwards.
- 2.12 If the aeroplane operator's annual CO<sub>2</sub> emissions from international flights subject to offsetting requirements, decreases below the threshold of 50,000 tonnes in two consecutive years, the aeroplane operator may opt to change its monitoring method on 1<sup>st</sup> January of the fourth year. However, if the aeroplane operator chooses to change its monitoring method, an updated Emissions Monitoring Plan will be required to be submitted to the Authority by 30<sup>th</sup> September of the third year.

**3.0 Emissions Monitoring Plan (EMP):**

- 3.1 The aeroplane operator shall submit an Emissions Monitoring Plan (EMP) to the Authority for approval latest by 30<sup>th</sup> September, 2018 to be applicable from 1<sup>st</sup> January, 2019 onwards. The EMP shall contain all relevant information as provided in the template issued by the Authority.
- 3.2 An aeroplane operator who starts international operations after 1<sup>st</sup> January, 2019, shall also submit an Emissions Monitoring Plan to the Authority within three months after it exceeds the threshold value of annual 10,000 tonnes of emissions.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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3.3 The aeroplane operator shall resubmit the Emissions Monitoring Plan to the Authority whenever there is a significant change in the information contained in the earlier submitted Emissions Monitoring Plan. For this purpose, the definition of significant change shall be referred. The aeroplane operator shall also inform, in writing, to the Authority with valid justification, about the changes in the revised Emissions Monitoring Plan.

3.4 If the aeroplane operator's Emissions Monitoring Plan is determined to be incomplete and/or inconsistent with the Emissions Monitoring Plan template, the Authority shall summarily reject the EMP and shall direct the aeroplane operator to resubmit the EMP along with the requisite information.

**4.0 Calculation of CO<sub>2</sub> emissions from aeroplane fuel use:**

4.1 The aeroplane operator using a Fuel Use Monitoring Method, shall determine the CO<sub>2</sub> emissions from international flights using the following equation for both conventional and sustainable aviation fuel:

**4.2 CO<sub>2</sub> Emissions (in tonnes) =  $\Sigma$  Mass of fuel (in tonnes) X Fuel conversion factor**

4.3 For the purpose of calculating CO<sub>2</sub> emissions, the mass of fuel used includes all aviation fuels. An aeroplane operator shall use the following value of fuel conversion factor: for Jet-A fuel = 3.16 (in kg CO<sub>2</sub>/kg fuel) and for AvGas or Jet-B fuel = 3.10 (in kg CO<sub>2</sub>/kg fuel).

4.4 The aeroplane operator shall convert the volume (if the fuel uplift is measured in units of volume) of the fuel into mass by applying proper fuel density value before using the aforesaid formula.

4.5 The aeroplane operator shall use an actual fuel density provided by the fuel vendor. In case, an actual fuel density value is not available, the operator shall use the standard value of 0.8 kg per litre for operational and safety reasons. However, the operator shall mention about the use of actual or standard fuel density in their Emission Monitoring Plan along with a reference to the relevant aeroplane operator's documentation.

**5.0 Monitoring of CORSIA eligible fuels claims:**

5.1 An aeroplane operator can reduce their emissions offset requirements by using CORSIA eligible fuels in place of conventional fuel. However, an aeroplane operator who intends to claim such emissions reductions shall use an ICAO



## **DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS**

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approved CORSIA eligible fuel that meets the “CORSIA Sustainability Criteria” as prescribed at ICAO CORSIA website.

- 5.2 Further, the aeroplane operator shall only use CORSIA eligible fuels from fuel producers that are certified by an approved Sustainable Certification Scheme and meet the requirements of CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes as prescribed at ICAO CORSIA website.
- 5.3 However, the aeroplane operator has to provide evidences in respect of the CORSIA eligible fuels purchased that meet ICAO’s sustainability criteria and certification scheme. In case, the aeroplane operator cannot demonstrate the compliance of the CORSIA eligible fuels with the sustainability criteria, then it shall be considered as conventional aviation fuel and no emissions reduction benefits shall be provided to the aeroplane operator.
- 5.4 The claims of emissions reductions from the use of CORSIA eligible fuels by an aeroplane operator shall be based on mass of CORSIA eligible fuels according to the available purchasing and blending invoices/records.
- 5.5 The emissions reductions from the use of a CORSIA eligible fuels are calculated based on the approved Life Cycle Emissions value (LSf) of the CORSIA eligible fuels used by the operator. The aeroplane operator shall provide necessary information on emissions reductions from using CORSIA eligible fuel in their Emissions Report whenever such emissions reductions are availed.

### **6.0 Reporting of CO<sub>2</sub> emissions:**

- 6.1 The aeroplane operator should use the standardised Emissions Report template provided by the Authority for demonstrating compliance with the CORSIA. The Emissions Report shall contain all the necessary information as per the template.
- 6.2 A copy of the duly verified Emissions Report and a copy of the associated Verification Report shall be submitted to the Authority at the end of each calendar year, by the aeroplane operator within the specified time line prescribed by the Authority. The aeroplane operator shall include the number of international flights operated in that year, both at the level of State pair and Aerodrome pair in their respective Emissions Report.
- 6.3 While submitting the consolidated CO<sub>2</sub> emissions from international flights for the 2019-2020 period, including subsidiary aeroplane operators, the aeroplane operator shall ensure that the Emissions Report submitted to the Authority also include the disaggregated data relating to each subsidiary aeroplane operator.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- 6.4 In specific circumstances where an aeroplane operator having a very limited number of State pairs operations that are subject to offset requirements and/or not subject to offset requirements, the aeroplane operator may request in writing to the Authority that such data shall not be published at the aeroplane operator level explaining the reasons why such data shall not be disclosed with proper justification. Based on the justification provided by the aeroplane operator, the Authority may consider about the confidentiality of such data and disclosure of such data at aeroplane operator level. However, the annual CO<sub>2</sub> emissions of an aeroplane operator on a given State pair will be considered as commercially sensitive only if they are determined using a Fuel Use Monitoring Method.
- 6.5 In specific circumstances where aggregated State pair data may be attributed to an identified aeroplane operator as a result of a very limited number of aeroplane operators conducting flights on a State pair, that aeroplane operator may request in writing to the Authority that such data not be published at State pair level, explaining the reasons why disclosure would harm their commercial interests. Based on this request, the Authority shall determine whether this data is confidential.
- 6.6 All aeroplane operator data which is deemed confidential in accordance with paragraphs 6.4 and 6.5 above shall be aggregated without attribution to the specific aeroplane operator
- 6.7 The Authority will calculate and inform each of the aeroplane operators about their average total CO<sub>2</sub> emissions during the 2019 and 2020 period.
- 6.8 The aeroplane operator shall subtract CORSIA eligible fuels traded or sold to a third party from its total reported quantity of CORSIA eligible fuels.
- 6.9 The aeroplane operator shall also provide a declaration of all other GHG schemes, it participates in, where the emissions reductions from the use of CORSIA eligible fuels may be claimed, and a declaration that it has not made claims for the same batches of CORSIA eligible fuel under other schemes.
- 6.10 To claim emissions reductions from the use of CORSIA eligible fuels in the Emissions Report, the aeroplane operator shall provide the information to THE AUTHORITY, within a given compliance period for all CORSIA eligible fuel received by a blender by the end of that compliance period. The information provided is through to the blend point, and includes information received from both the neat (unblended) fuel producer and the fuel blender.
- 6.11 The aeroplane operator should make CORSIA eligible fuel claims on an annual basis in order to ensure all documentation is dealt with in a timely manner. However, the aeroplane operator has the option to decide when to make a

# DEPARTMENT OF CIVIL AVIATION

## REPUBLIC OF MAURITIUS

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CORSIA eligible fuel claim within a given compliance period for all CORSIA eligible fuel received by a blender within that compliance period. However, for any blending that occurs in the second half of the final year of a compliance period, the Authority should determine whether any flexibility is needed to be provided to the aeroplane operator in terms of submitting reports.

- 6.12 If the aeroplane operator purchases fuel from a supplier downstream from the fuel blender (e.g., from a distributor, another aeroplane operator, or an aerodrome-based fuel distributor), this fuel supplier shall provide all of the requisite documentation in order for the emissions reductions from the use of CORSIA eligible fuels to be claimed by the aeroplane operator.

### **7.0 Verification of CO<sub>2</sub> emissions:**

- 7.1 For the purpose of cross-check of annual reported data, the aeroplane operator should perform an internal pre-verification of its Emissions Report prior to submitting the same for verification to an external verifier. The aeroplane operator shall engage a verification body for the verification of its annual Emissions Report.

- 7.2 More details about a verification body and the relevant requirements about its accreditation is provided in details at Chapter-7 of this MCAR.

- 7.3 The aeroplane operator and the verification body, shall both independently submit a copy of the Emissions Report and associated Verification Report to the Authority, within the stipulated timeline as communicated by the Authority.

- 7.4 Fuel purchases, transaction reports, fuel blending records and sustainability credentials shall constitute the documentary proof for the purpose of verification and approval of emissions reductions from the use of CORSIA eligible fuels.

- 7.5 The aeroplane operator shall ensure that it, or its designated representative, has audit rights of the production records for the sustainable aviation fuels that it purchases from a vendor.

### **8.0 Data gaps**

- 8.1 The aeroplane operator shall take utmost care to avoid any data gaps in their annual Emissions Report while submitting such reports to the Authority and the verification body. Data gaps in reported emissions-related data, can occur due to irregular operations, data feed issues, human error, critical system failures, etc. Any such data gaps that are identified by the verification body may lead non-compliance with the CORSIA requirements and ultimately could result in Found unsatisfactory of an Emissions Report by the verification body. A data gap could

## DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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also be identified by the Authority in its review process of the verified Emissions Report.

- 8.2 The aeroplane operator using a Fuel Use Monitoring Method, shall fill data gaps using the ICAO CERT, provided that the data gaps during a compliance period do not exceed the following thresholds:
- (i) 2019-2020 period: 5 per cent of international flights.
  - (ii) 2021-2035 period: 5 per cent of international flights subject to offsetting requirements.
- 8.3 The aeroplane operator shall correct issues identified with the data and information management system in a timely manner to mitigate ongoing data gaps and system weaknesses. If the aeroplane operator realizes it has data gaps and system weaknesses that exceed the threshold as mentioned in paragraph 8.2 above, it shall approach the Authority to take remedial action to address this.
- 8.4 When the threshold is exceeded, the aeroplane operator shall mention the percentage of international flights, for the 2019-2020 period, or flights subject to offsetting requirements, for the 2021-2035 period, that had data gaps, and provide an explanation to the Authority in their annual Emissions Report.
- 8.5 The aeroplane operator shall fill all data gaps and correct systematic errors and misstatements prior to the submission of the Emissions Report to the Authority. The aeroplane operator shall ensure that procedure for identifying and rectifying any data gaps is properly documented in their procedure manual which shall be referred by the Authority in case of rectification process of such data gaps.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**CHAPTER 4      CHAPTER 4 CO<sub>2</sub> OFFSETTING REQUIREMENTS  
FROM INTERNATIONAL FLIGHTS.**

**1.0      Applicability of CO<sub>2</sub> offsetting requirements:**

- 1.1      As such, the offsetting requirements are applicable from 1<sup>st</sup> January 2021 to 31<sup>st</sup> December 2035. However, for Mauritian scheduled operators with international operations from Mauritius to a State and back, the offsetting requirements of this MCAR shall be applicable from 1<sup>st</sup> January 2027 onwards except the aeroplane operators having international operations between two States that have opted to participate in the voluntary phases of CORSIA also.
- 1.2      The requirements of this MCAR shall not be applicable to a new entrant aeroplane operator for the first three years starting in the year when its annual CO<sub>2</sub> emissions from international operations exceeds 10,000 tonnes or until its annual emissions level exceeds 0.1% of 2020 emissions level, whichever occurs earlier. The requirements of this MCAR shall then be applicable from 1st January of the subsequent year.

**2.0      CO<sub>2</sub> offsetting requirements:**

- 2.1      The amount of CO<sub>2</sub> emissions of an aeroplane operator, required to be offset in a given year from 1<sup>st</sup> January 2021 to 31<sup>st</sup> December 2023 prior to consideration of the sustainable aviation fuels, shall be calculated as follows:

**Operator's Offsetting Requirements in a given year = Operator's CO<sub>2</sub> emissions in that year X Sector's Growth Factor.**

- 2.2      The Sector's Growth Factor applicable for a given year, will be published by ICAO and is defined as

**SGF = [(Total sectoral CO<sub>2</sub> emissions in year Y- Average total annual sectoral CO<sub>2</sub> emissions during 2019 and 2020 in the given year) / Total sectoral CO<sub>2</sub> emissions in year Y].**

Sectoral emissions in a given year do not include the CO<sub>2</sub> emissions from new entrants during their exception period.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- 2.3 As the participation of States in CORSIA change over time, the average of total sectoral CO<sub>2</sub> emissions during 2019 and 2020 covered by these State pairs in the given year Y will be recalculated by ICAO.
- 2.4 The Authority will calculate, for each of the aeroplane operators, the amount of CO<sub>2</sub> emissions required to be offset in a given year from 1<sup>st</sup> January 2024 to 31<sup>st</sup> December 2035 (without emissions reduction from use of CORSIA eligible fuels), every year as follows:

**Aeroplane operator’s offsetting requirements in the given year Y = Percent Sectoral in the given year Y X (Aeroplane operator’s CO<sub>2</sub> emissions in the given year Y X Sector’s Growth Factor) + Percent Individual in the given year Y X (Aeroplane operator’s CO<sub>2</sub> emissions in the given year Y X Aeroplane operator’s Growth Factor).**

Where percent individual in the given year y = (100% - Percent Sectoral in the given year y). For the period 2021 to 2029, the values of Percent Sectoral and Percent Individual are 100% and 0% respectively and hence the last term in the above formula shall not be considered. However, from 2030 onwards, ICAO will specify exact values of Percent Sectoral and Percent Individual to be used.

The table below gives an overview of CO<sub>2</sub> offsetting requirements on a sectoral and individual basis during different compliance periods. However, the final value of percent individual in a given year (%O<sub>y</sub>) will be determined by the ICAO in its future Assemblies. However, the tentative values are as shown below:

<b>Year of applicability</b>	<b>%S<sub>y</sub></b>	<b>%O<sub>y</sub></b>
1 January 2024 to 31 December 2029	100%	0%
1 January 2030 to 31 December 2032	(100% - %O <sub>y</sub> )	A specified percentage of at least 20%
1 January 2033 to 31 December 2035	(100% - %O <sub>y</sub> )	A specified percentage of at least 70%

- 2.5 ICAO will provide the applicable value of Sector Growth Factor on yearly basis.
- 2.6 The Authority will calculate the aeroplane operator’s Growth Factor for a given year in accordance with the CO<sub>2</sub> emissions from the verified Emissions Reports submitted by aeroplane operators which is calculated as:
- [(Total aeroplane operator’s CO<sub>2</sub> emissions in the given year Y - Average total annual aeroplane operator’s CO<sub>2</sub> emissions during 2019 and 2020 in the given year Y) / Total aeroplane operator’s CO<sub>2</sub> emissions in the given year Y].

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- 2.7 The Authority will inform the aeroplane operator of its final offsetting requirements within the stipulated timeline upon calculating the final offsetting requirements for a given compliance period of each of the aeroplane operators.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**CHAPTER 5 EMISSIONS REDUCTIONS FROM THE USE OF  
SUSTAINABLE AVIATION FUELS.**

**1.0 Emissions reductions from the use of sustainable aviation fuels:**

- 1.1 The aeroplane operator that intends to claim for emissions reductions from the use of CORSIA eligible fuels in a given year shall compute emissions reductions as follow:

Emissions reductions from the use of sustainable aviation fuels in the given year Y (in tonnes) =  $[\sum \text{Total mass of a neat CORSIA eligible fuel claimed in the given year Y (in tonnes)} \times \{1 - (\text{LSf/LC})\}] \times \text{Fuel Conversion Factor}$ .

The aeroplane operator shall use the value of fuel conversion factor for Jet-A fuel = 3.16 kg CO<sub>2</sub>/kg fuel and for AvGas or Jet-B fuel = 3.10 kg CO<sub>2</sub>/kg fuel.

The Emissions reduction factor (ERFf) of a CORSIA eligible fuel is the ratio (1-LSf/LC) where LSf = Life cycle emissions value for a CORSIA eligible fuel (in gCO<sub>2</sub>e/MJ) and LC = Life cycle emissions values for a conventional aviation fuel, equal to 89 gCO<sub>2</sub>e/MJ for jet fuel and equal to 95 gCO<sub>2</sub>e/MJ for AvGas.

- 1.2 For each of the CORSIA eligible fuels claimed, the total mass of the neat CORSIA eligible fuel claimed in the given year Y needs to be multiplied by its emissions reduction factor (ERFf.) Then the quantities are summed up for all CORSIA eligible fuels.
- 1.3 In order to use the value for both Default Life Cycle Emissions value and Actual Life Cycle Emissions value when used for the calculation of CORSIA eligible fuels, the aeroplane operator shall approach the Authority for the values to be used.
- 1.4 If an Actual Life Cycle Emissions value is used, then an approved Sustainability Certification Scheme shall ensure that the methodology used for calculating Actual Life Cycle Emissions values has been applied correctly.

**2.0 Total final CO<sub>2</sub> offsetting requirements for a given compliance period with emissions reductions from the use of CORSIA eligible fuels:**

- 2.1 The amount of CO<sub>2</sub> emissions required to be offset by the aeroplane operator, after taking into account emissions reductions from the use of CORSIA eligible fuels in a given year from 1st January 2021 to 31st December 2035, shall be calculated by the Authority as follows:

**Aeroplane operator's total final offsetting requirements in the given compliance period =  $\sum$  Aeroplane operator's total offsetting requirements in**



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**the given years of the compliance period –  $\Sigma$  Emissions reductions from the use of CORSIA eligible fuels in the given years of the compliance period.**

- 2.2 If the aeroplane operator's total final offsetting requirements during a compliance period is zero or negative, then the aeroplane operator has no offsetting requirements for that compliance period. However, the negative offsetting requirements shall not be carried forward to subsequent compliance periods.
- 2.3 The aeroplane operator's total final offsetting requirements during a compliance period shall be rounded up to the nearest tonne of CO<sub>2</sub>.
- 2.4 After calculating the final offsetting requirements for a given compliance period of each of the aeroplane operators, the Authority will inform the aeroplane operator of their final offsetting requirements individually within the stipulated timeline.
- 2.5 The aeroplane operator shall then meet their offsetting requirements through CORSIA Eligible Emissions Units.

# DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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## CHAPTER 6 EMISSIONS UNITS.

### 1.0 Applicability of Emissions Units

- 1.1 The requirements of this chapter shall be applicable to an aeroplane operator who has to demonstrate compliance against its offsetting requirements by purchasing CORSIA Eligible Emissions Units.

### 2.0 Cancelling CORSIA Eligible Emissions Units:

- 2.1 The aeroplane operator shall meet its offsetting requirements by cancelling CORSIA Eligible Emissions Units in a quantity equal to the sum of its final offsetting requirements for a given compliance period. The CORSIA Eligible Emissions Units are those units which meet the ICAO approved CORSIA Emissions Unit Eligibility Criteria and can be used for demonstrating compliance to meet its offsetting requirements under CORISA.

- 2.2 To fulfil the provisions of paragraph 2.1 above, the aeroplane operator shall:

- (a) Cancel such CORSIA Eligible Emissions Units within a registry designated by a CORSIA Eligible Emissions Unit Programme within the stipulated timeline, and
- (b) Request each CORSIA Eligible Emissions Unit Programme registry to make visible on the registry's public website, information regarding cancelled CORSIA Eligible Emissions Units for a given compliance period of each aeroplane operator. Such information for each cancelled CORSIA Eligible Emissions Unit shall include the consolidated identifying information such as quantity of emissions units cancelled, Start of serial numbers, End of serial numbers, date of cancellation, Eligible emissions unit programme, Unit type, Host country, Methodology, Demonstration of unit date eligibility and aeroplane operator in whose name the units were cancelled.

- 2.1 "Cancel" means the permanent removal and single use of a CORSIA Eligible Emissions Unit within a CORSIA Eligible Emissions Unit Programme designated registry such that the same emissions unit may not be used more than once. This is sometimes also referred to as "retirement", "cancelled", "cancelling" or "cancellation".

# DEPARTMENT OF CIVIL AVIATION

## REPUBLIC OF MAURITIUS

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### **3.0 Reporting emissions unit cancellation:**

- 3.1 To meet its final offsetting requirements for a given compliance period, the aeroplane operator shall report to the Authority, the cancellation of CORSIA Eligible Emissions Units carried out, by submitting to the Authority a copy of the verified Emissions Unit Cancellation Report for approval and a copy of the associated Verification Report.
- 3.2 The Emissions Unit Cancellation Report shall contain information such as quantity of emissions units cancelled, Start of serial numbers, End of serial numbers, date of cancellation, Eligible emissions unit programme, Unit type, Host country, Methodology, Demonstration of unit date eligibility, Programme-designated registry name, Unique identifier for registry account to which the batch was cancelled and aeroplane operator in whose name the units were cancelled and shall be submitted to the Authority within the stipulated timeline.
- 3.3 Once the information pertaining to emissions Units for a given compliance period is submitted to ICAO, the Authority may publish the following information for a given compliance period:
- (a) Total final offsetting requirements over the compliance period for each aeroplane operators, and
  - (b) Total quantity of emissions units cancelled over the compliance period by each aeroplane operator to reconcile the total final offsetting requirements, as reported by each aeroplane operator.

### **4.0 Verification of an Aeroplane Operator's Emissions Unit Cancellation Report**

- 4.1 The aeroplane operator shall engage a verification body for the verification of its Emissions Unit Cancellation Report. The aeroplane operator may choose to use the same verification body engaged for the verification of its Emissions Report earlier.
- 4.2 Details about a verification body and its relevant requirements are mentioned in Chapter-7 of this MCAR.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- 4.3 The aeroplane operator shall provide access to the verification body for all relevant information on the cancellation of emissions units.
- 4.4 The aeroplane operator and the verification body shall both independently submit a copy of the Emissions Unit Cancellation Report and associated Verification Report to the Authority within the stipulated timeline, following the verification of the Emissions Unit Cancellation Report by the verification body.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**CHAPTER 7      VERIFICATION BODY AND NATIONAL  
ACCREDITATION BODY**

**1.0      Verification Body and National Accreditation Body:**

- 1.1      The aeroplane operator shall engage a verification body for the verification of its annual Emissions Report and Emissions Unit Cancellation Report.
- 1.2      A verification body shall conduct the verification according to ISO 14064-3:20061, and the relevant requirements as mentioned in Chapter-3 of this Mauritius Civil Aviation Requirements.
- 1.3      A verification body shall be accredited to ISO 14065:20135 and the relevant requirements as mentioned in Chapter-3 of this Mauritius Civil Aviation Requirements, by a national accreditation body, or a foreign accreditation body in order to be eligible to verify the Emissions Unit Cancellation Report of an aeroplane operator.
- 1.4      A national accreditation body or a foreign accreditation body shall be working in accordance with ISO/IEC 17011:20046.
- 1.5      An operator may also engage a verification body accredited in other State for verification of CORSIA related tasks.
- 1.6      The verification body shall also possess sufficient knowledge of aviation industry and associated Greenhouse Gas inventory and the verification body.
- 1.7      A verification body can approach THE AUTHORITY for their further training in order to qualify as a verifier under CORSIA.
- 1.8      The verification bodies to be empanelled with THE AUTHORITY should be third party verification bodies accredited as per ISO 14065 for CORSIA scheme.
- 1.9      THE AUTHORITY will give provisional approval to verification bodies in case they have applied for accreditation by April 2019. However, Verification bodies have to ensure that they are accredited within six months of application”.

# DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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## APPENDIX ONE

**Administrative partnership:** Delegation of administering tasks in this Volume from one State to another State(s).

**Aerodrome:** A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

**Aerodrome pair:** A group of two aerodromes composed of a departing aerodrome and an arrival aerodrome.

**Aeroplane:** A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

**Aeroplane owner:** Person(s), organization(s) or enterprise(s) identified via Item 4 (Name of owner) and Item 5 (Address of owner) on the certificate of registration of an aeroplane.

**Air operator certificate (AOC):** A certificate authorizing an operator to carry out specified commercial air transport operations.

**Aviation alternative fuel:** A non-petroleum-based drop-in aviation fuel.

**Conventional aviation fuel:** A petroleum-based drop-in aviation fuel.

**Conversion process:** A type of technology used to convert a feedstock into aviation alternative fuel.

**Feedstock:** A type of unprocessed raw material used for the production of aviation alternative fuel.

**Flight plan:** Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

**Flight time – aeroplanes:** The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Note.— Flight time as here defined is synonymous with the term “block to block” time or “chock to chock” time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.

**Fuel uplift:** Measurement of fuel provided by the fuel supplier, as documented in the fuel delivery notes or invoices for each flight (in litre). A-11

# DEPARTMENT OF CIVIL AVIATION

## REPUBLIC OF MAURITIUS

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**Great Circle Distance:** The shortest distance, rounded to the nearest kilometre, between the origin and the destination aerodromes, measured over the earth's surface modelled according to the World Geodetic System 1984 (WGS84).

Note. – Latitude and longitude coordinates of aerodromes can be obtained from the ICAO Location Indicators database.

**National accreditation body:** Authorised body which attests that a verification body is competent to provide specific verification services.

**New entrant:** Any aeroplane operator that commences an aviation activity falling within the scope of this Volume on or after its entry into force and whose activity is not in whole or in part a continuation of an aviation activity previously performed by another aeroplane operator.

**Notifying State:** The State that has submitted to ICAO the request for the registration of or change in the three-letter designator of an aeroplane operator over which it has jurisdiction.

**Operator:** The person, organization or enterprise engaged in or offering to engage in an aircraft operation.

**Pathway:** A specific combination of feedstock and conversion process used for the production of aviation alternative fuel.

**Reporting period:** A period which commences on 1 January and finishes on 31 December in a given year for which an aeroplane operator or State reports required information.

**State pair:** A group of two Contracting States composed of a departing Contracting State or its territories and an arrival Contracting State or its territories.

**Sustainable aviation fuel:** An aviation alternative fuel that meets the CORSIA Sustainability Criteria under this Volume.

**Verification of report:** An independent and systematic evaluation process of an emissions report and, when required, a cancellation of eligible emissions units report, which has been sufficiently documented.

**Verification body:** A legal entity that performs the verification of an Emissions Report and, when required, an Emissions Units Cancellation Report, as an accredited independent third party.

**Verification team:** A group of verifiers, or a single verifier that also qualifies as a team leader, belonging to a verification body conducting the verification of an Emissions Report and, when required, an Emissions Units Cancellation Report. The team can be supported by technical experts.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**Verification report.** A document, drafted by the verification body, containing the verification statement and required supporting information.



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**APPENDIX TWO - ABBREVIATIONS AND UNITS**

Where the following abbreviations are used in this MCAR, they have the meanings ascribed to them below:

Abbreviations

ACARS	Aircraft Communications Addressing and Reporting System
AOC	Air operator certificate
CERT	CO <sub>2</sub> Estimation and Reporting Tool
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
GHG	Greenhouse gases
IAF	International Accreditation Forum
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
MRV	Monitoring, Reporting and Verification
MJ	Megajoule
RTK	Revenue Tonne Kilometres

Non-SI units

The non-SI units listed in Table A shall be used either in lieu of, or in addition to, SI units as primary units of measurement under this MCAR.

Table A Non-SI units for use with SI

<b>Specific quantity</b>	<b>Unit</b>	<b>Symbol</b>	<b>Definition (in terms of SI units)</b>
mass	tonne	t	1 t = 10 <sup>3</sup> kg
time	hour	h	1 h = 60 min = 3 600 s
volume	litre	L	1 L = 1 dm <sup>3</sup> = 10 <sup>-3</sup> m <sup>3</sup>

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**APPENDIX THREE - ICAO ASSEMBLY RESOLUTION A39-3**

**Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme**

*Whereas* Assembly Resolution A38-18 decided to develop a global market-based measure (GMBM) scheme for international aviation, for decision by the 39th Session of the Assembly;

*Recalling* that Assembly Resolution A38-18 requested the Council, with the support of Member States, to finalize the work on the technical aspects, environmental and economic impacts and modalities of the possible options for a GMBM scheme, including on its feasibility and practicability, taking into account the need for development of international aviation, the proposal of the aviation industry and other international developments, as appropriate, and without prejudice to the negotiations under the UNFCCC;

*Also recalling* that Assembly Resolution A38-18 requested the Council, with the support of Member States, to identify the major issues and problems, including for Member States, and make a recommendation on a GMBM scheme that appropriately addresses them and key design elements, including a means to take into account special circumstances and respective capabilities, and the mechanisms for the implementation of the scheme from 2020 as part of a basket of measures which also include technologies, operational improvements and sustainable alternative fuels to achieve ICAO's global aspirational goals;

*Recognizing* that ICAO is the appropriate forum to address emissions from international aviation, and the significant amount of work undertaken by the Council, its Environment Advisory Group (EAG) and its Committee on Aviation Environmental Protection (CAEP) to develop a recommendation for a GMBM scheme and its design elements and implementation mechanisms, including the analyses of various approaches for distribution of obligations;

*Further recalling* that Assembly Resolution A38-18 requested the Council, with the support of Member States, to organize seminars, workshops on a GMBM scheme for international aviation participated by officials and experts of Member States as well as relevant organizations;

*Recognizing* the convening of two rounds of Global Aviation Dialogues (GLADs) seminars held in 2015 and 2016 for all regions;

*Noting* the support of the aviation industry for a single global carbon offsetting scheme, as opposed to a patchwork of State and regional MBMs, as a cost effective measure to complement a broader package of measures including technology, operations and infrastructure measures;

*Recognizing* that MBMs should not be duplicative and international aviation CO<sub>2</sub> emissions should be accounted for only once;

## DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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*Emphasizing* that the decision by the 38<sup>th</sup> Session of the Assembly to develop a global MBM scheme for international aviation reflects the strong support of Member States for a global solution for the international aviation industry, as opposed to a possible patchwork of State and regional MBMs;

*Reaffirming* the concern with the use of international civil aviation as a potential source for the mobilization of revenue for climate finance to the other sectors, and that MBMs should ensure the fair treatment of the international aviation sector in relation to other sectors;

*Recalling* the UNFCCC and the Paris Agreement and *acknowledging* its principle of common but differentiated responsibilities and respective capabilities, in light of different national circumstances;

*Also acknowledging* the principles of non-discrimination and equal and fair opportunities to develop international aviation set forth in the Chicago Convention;

*Welcoming* the adoption of the Paris Agreement under the UNFCCC and *recognizing* that the work related to a global MBM scheme for international aviation and its implementation will contribute to the achievement of the goals set out in the Paris Agreement;

*Whereas* the UNFCCC and the Paris Agreement provide for mechanisms, such as the Clean Development Mechanism (CDM) and a new market mechanism under the Paris Agreement, to contribute to the mitigation of GHG emissions to support sustainable development, which benefit developing States in particular;

*Welcoming* the cooperation between the United Nations Framework Convention on Climate Change (UNFCCC) and ICAO on the development of CDM methodologies for aviation;

*Recognizing* that this Resolution does not set a precedent for or prejudice the outcome of negotiations under the UNFCCC, the Paris Agreement, or other international agreements, nor represent the position of the Parties to the UNFCCC, the Paris Agreement, or other international agreements;

The Assembly:

1. Resolves that this Resolution, together with Resolution A39-1: Consolidated statement of continuing ICAO policies and practices related to environmental protection - General provisions, noise and local air quality and Resolution A39-2: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change, supersede Resolutions A38-17 and A38-18 and constitute the consolidated statement of continuing ICAO policies and practices related to environmental protection;
2. Acknowledges the progress achieved on all elements of the basket of measures available to address CO<sub>2</sub> emissions from international aviation, including aircraft technologies, operational improvements, sustainable alternative fuels and a GMBM scheme and any other measures, and affirms the preference for the use

## DEPARTMENT OF CIVIL AVIATION REPUBLIC OF MAURITIUS

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of aircraft technologies, operational improvements and sustainable alternative fuels that provide the environmental benefits within the aviation sector;

3. Also acknowledges that, despite this progress, the environmental benefits from aircraft technologies, operational improvements and sustainable alternative fuels may not deliver sufficient CO<sub>2</sub> emissions reductions to address the growth of international air traffic, in time to achieve the global aspirational goal of keeping the global net CO<sub>2</sub> emissions from international aviation from 2020 at the same level;
4. Emphasizes the role of a GMBM scheme to complement a broader package of measures to achieve the global aspirational goal, without imposing inappropriate economic burden on international aviation;
5. 5. Decides to implement a GMBM scheme in the form of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to address any annual increase in total CO<sub>2</sub> emissions from international civil aviation (i.e. civil aviation flights that depart in one country and arrive in a different country) above the 2020 levels, taking into account special circumstances and respective capabilities;
6. Requests the Council to continue to ensure all efforts to make further progress on aircraft technologies, operational improvements and sustainable alternative fuels be taken by Member States and reflected in their action plans to address CO<sub>2</sub> emissions from international aviation, and to monitor and report the progress on implementation of action plans, and that a methodology should be developed to ensure that an aircraft operator's offsetting requirements under the scheme in a given year can be reduced through the use of sustainable alternative fuels, so that all elements of the basket of measures are reflected;
7. Request the Council to continuously monitor the implementation of all elements of the basket of measures, and consider the necessary policies and actions to ensure that progress is achieved in all of the elements in a balanced way with an increasing percentage of emissions reductions accruing from non-MBM measures over time;
8. Acknowledges special circumstances and respective capabilities of States, in particular developing States, in terms of vulnerability to the impacts of climate change, economic development levels, and contributions to international aviation emissions, among other things, while minimizing market distortion;
9. Decides the use of a phased implementation for the CORSIA to accommodate the special circumstances and respective capabilities of States, in particular developing States, while minimizing market distortion, as follows:
  - a) Pilot phase applies from 2021 through 2023 to States that have volunteered to participate in the scheme. States participating in this phase may determine the basis of their aircraft operator's offsetting requirements from paragraph 11 e) i) below;

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- b) First phase applies from 2024 through 2026 to States that voluntarily participate in the pilot phase, as well as any other States that volunteer to participate in this phase, with the calculation of offsetting requirements in paragraph 11 a) below;
  - c) All States are strongly encouraged to voluntarily participate in the pilot phase and the first phase, noting that developed States, which have already volunteered, are taking the lead, and that several other States have also volunteered;
  - d) The Secretariat will make public on the ICAO website updated information on the States that volunteered to participate in the pilot phase and first phase;
  - e) Second phase applies from 2027 through 2035 to all States that have an individual share of international aviation activities in RTKs in year 2018 above 0.5 per cent of total RTKs or whose cumulative share in the list of States from the highest to the lowest amount of RTKs reaches 90 per cent of total RTKs, except Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developing Countries (LLDCs) unless they volunteer to participate in this phase;
  - f) States that are exempted or have not yet participated are strongly encouraged to voluntarily participate in the scheme as early as possible, in particular those States that are members of a regional economic integration organization. States who decide to voluntarily participate in the scheme, or decide to discontinue the voluntary participation from the scheme, may only do so from 1 January in any given year and they shall notify ICAO of their decision by no later than 30 June of the preceding year;
  - g) Starting in 2022, the Council will conduct a review of the implementation of the CORSIA every three years, including its impact on the growth of international aviation, which serves as an important basis for the Council to consider whether it is necessary to make adjustments to the next phase or compliance cycle and, as appropriate, to recommend such adjustments to the Assembly for its decision;
10. *Decides* that the CORSIA shall apply to all aircraft operators on the same routes between States with a view to minimizing market distortion, as follows:
- a) all international flights on the routes between States, both of which are included in the CORSIA by paragraph 9 above, are covered by the offsetting requirements of the CORSIA;
  - b) all international flights on the routes between a State that is included in the CORSIA and another State that is not included in the CORSIA by paragraph 9 above are exempted from the offsetting requirements of the CORSIA, while retaining simplified reporting requirements; and

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- c) all international flights on the routes between States, both of which are not included in the CORSIA by paragraph 9 above, are exempted from the offsetting requirements of the CORSIA, while retaining simplified reporting requirements;
11. *Decides* that the amount of CO<sub>2</sub> emissions required to be offset by an aircraft operator in a given year from 2021 is calculated every year as follows:
- a) an aircraft operator's offset requirement = [ % Sectoral × (an aircraft operator's emissions covered by CORSIA in a given year × the sector's growth factor in the given year)] + [ % Individual × (an aircraft operator's emissions covered by CORSIA in a given year × that aircraft operator's growth factor in the given year);
- b) where the sector's growth factor = (total emissions covered by CORSIA in the given year – average of total emissions covered by CORSIA between 2019 and 2020) / total emissions covered by CORSIA in the given year;
- c) where the aircraft operator's growth factor = (the aircraft operator's total emissions covered by CORSIA in the given year – average of the aircraft operator's emissions covered by CORSIA between 2019 and 2020 ) / the aircraft operator's total emissions covered by CORSIA in the given year;
- d) where the % Sectoral = (100% – % Individual) and;
- e) where the % Sectoral and % Individual will be applied as follows:
- (i) from 2021 through 2023, 100% sectoral and 0% individual, though each participating State may choose during this pilot phase whether to apply this to:
- a) an aircraft operator's emissions covered by CORSIA in a given year, as stated above, or
- b) an aircraft operator's emissions covered by CORSIA in 2020;
- (ii) from 2024 through 2026, 100 % sectoral and 0% individual;
- (iii) from 2027 through 2029, 100 % sectoral and 0% individual;
- (iv) from 2030 through 2032, at least 20% individual, with the Council recommending to the Assembly in 2028 whether and to what extent to adjust the individual percentage;

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- (v) from 2033 through 2035, at least 70% individual, with the Council recommending to the Assembly in 2028 whether and to what extent to adjust the individual percentage;
- f) the aircraft operator's emissions and the total emissions covered by CORSIA in the given year do not include emissions exempted from the scheme in that year;
- g) the scope of emissions in paragraphs 11 b) and 11 c) above will be recalculated at the start of each year to take into account routes to and from all States that will be added due to their voluntary participation or the start of a new phase or compliance cycle;
12. *Decides* that a new entrant<sup>5</sup> is exempted from the application of the CORSIA for three years or until the year in which its annual emissions exceed 0.1 per cent of total emissions in 2020, whichever occurs earlier. From the subsequent year, the new entrant is included in the scheme and treated in the same way as the other aircraft operators.
13. *Decides* that, notwithstanding with the provisions above, the CORSIA does not apply to low levels of international aviation activity with a view to avoiding administrative burden: aircraft operators emitting less than 10,000 metric tonnes of CO<sub>2</sub> emissions from international aviation per year; aircraft with less than 5,700 kg of Maximum Take Off Mass (MTOM); or humanitarian, medical and firefighting operations;
14. *Decides* that the emissions that are not covered by the scheme, as the results of phased implementation and exemptions, are not assigned as offsetting requirements of any aircraft operators included in the scheme;
15. *Notes* the work of the Council, with the technical contribution of CAEP, on: a) the monitoring, reporting and verification (MRV) system; b) recommended criteria for emissions units to be purchased by aircraft operators that take into account developments in the UNFCCC process; c) and registries under the CORSIA, and *requests* the Council, with the technical contribution of CAEP, to complete its work as soon as possible

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**APPENDIX FOUR – 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 CO<sub>2</sub> 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.*



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**1 VERSION CONTROL OF EMISSIONS MONITORING PLAN**

**(a) Version No.**

*Please enter version number of the current version.*

**(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.

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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.*

--

**(b) Address of the aeroplane operator**

*Please enter the address of the aeroplane operator.*

Address line:	
City:	
State/Province/Region:	
Postcode/ZIP:	
Country:	

**(c) Legal representative**

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

Title:	
First name:	
Surname:	
Email address:	
Telephone number:	
Address line 1:	
Address line 2:	
City:	
State/Province/Region:	

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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Postcode/ZIP:	
Country:	

**(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***

**(d1) Responsibility under the CORSIA**

**(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).*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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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		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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(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.*

**(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".*

**(e2) Date of issue**

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

**(e3) Date of expiry**

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

**(e4) Competent authority for the AOC**

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

Name of the authority:	
Address line:	
City:	
State/Province/Region:	
Postcode/ZIP:	
Country:	

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(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?*

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

**(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.*

**(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?*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

**(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-subsidary 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-subsidary 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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

*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.*

**(h) Contact person**

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

Title:	
First name:	
Surname:	
Email address:	
Telephone number:	
Address line 1:	
Address line 2:	
City:	
State/Province/Region:	



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

Postcode/ZIP:	
Country:	

**(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:	
First name:	
Surname:	
Email address:	
Telephone number:	
Address line 1:	
Address line 2:	
City:	
State/Province/Region:	
Postcode/ZIP:	
Country:	

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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 aeroplane	No.	ICAO type designator	Fuel type	Number of aeroplane
1				21			
2				22			
3				23			
4				24			
5				25			
6				26			
7				27			
8				28			
9				29			
10				30			
11				31			
12				32			
13				33			
14				34			
15				35			
16				36			
17				37			
18				38			
19				39			
20				40			

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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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?*

--

**(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	
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**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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Description of procedure	
Location of records	

**(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	
Description of procedure	
Location of records	

**(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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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No.	State of origin	State of destination
1		
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3		
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**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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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	
Description of procedure	
Location of records	

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(g) Determination of international flights with offsetting requirements**

*Please provide information on the procedures for determining which international flights are subject to CO 2 offsetting requirements under the CORSIA as described in Annex 16, Volume IV, Part II, Chapter 3, 3.1.*

Responsible department	
Description of procedure	
Location of records	

**(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	
Description of procedure	
Location of records	

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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>*



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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- *Estimation and Reporting Tool (CERT).*

**(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.*

**(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			
Block-off / Block-on			
Fuel Uplift			
Fuel Allocation with Block Hour			

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

**(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.*

**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.*

**(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

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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.

**(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

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

---

**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, transmittin]g and storing of fuel data. Please provide a reference to the corresponding documentation.

**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.*

**(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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(b) Fuel uplift**

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

**(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*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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.	
<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.	

**(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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(c) Fuel uplift**

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

**(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*



**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**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*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**5.0 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.*

**(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).

**(b1) Description of available secondary sources**

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

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(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.*

**(b3) Data gaps despite secondary sources**

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

**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.*

**DEPARTMENT OF CIVIL AVIATION  
REPUBLIC OF MAURITIUS**

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**(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*

**(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.*

**(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.*