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# **Guidance for Aircraft Operators**

## How to compile a monitoring plan in accordance with the Ordinance on the Acquisition and Reporting of Tonne-Kilometre Data relating to Distances Covered by Aircraft

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Reference: Q263-1469

### **Disclaimer**

This document was developed by the Swiss Federal Office of the Environment (FOEN) to assist aircraft operators with the compilation of a monitoring plan in accordance with the Ordinance on the Acquisition and Reporting of Tonne-Kilometre Data relating to Distances Covered by Aircraft (tkm-Ordinance). It is not legally binding. It is based on a document prepared by the Dutch Emissions Authority in cooperation with the UK Environment Agency<sup>1</sup> and has been adapted to the requirements of the Swiss tkm-Ordinance. It is also based on a document produced by the European Commission<sup>2</sup> which assists aircraft operators to comply with the relevant European Monitoring and Reporting Regulation in the EU Emissions Trading Scheme.

The FOEN wishes to thank the Dutch and UK authorities and the European Commission for permission to use their respective guidance documents.

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<sup>1</sup> Guidance for the Aviation Industry: Monitoring and Reporting Annual Emissions and Tonne km Data for EU Emissions Trading. Dutch Emissions Authority and UK Environment Agency, May 2009.

<sup>2</sup> Guidance Document No. 2: The Monitoring and Reporting Regulation, General Guidance for Aircraft Operators. European Commission, July 2012.

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## 1 General information

### Purpose of the acquisition and reporting of tonne-kilometre data from aviation activities

Switzerland and the European Union (EU) concluded negotiations on the linking of their emissions trading schemes (ETS) in 2016. The linking agreement is to enter into force after its signature and ratification by both parties. Aviation activities have been included in the EU ETS since 2012 and are to be included in the Swiss ETS once the linking agreement has entered into force.

To prepare for this inclusion, aircraft operators will be required to monitor and report tonne-kilometre data (tkm data) relating to flights as specified by the Ordinance on the Acquisition and Reporting of Tonne-Kilometre Data relating to Distances Covered by Aircraft (tkm-Ordinance) during 2018. The resulting data are to serve as a basis for calculating the free allocation of aviation emission allowances for aircraft operators and the maximum amount of available aviation emission allowances in the Swiss ETS. To ensure the correct monitoring of the data, aircraft operators who carry out activities in accordance with the tkm-Ordinance must compile a monitoring plan and submit it to the Federal Office for the Environment (FOEN) for evaluation by not later than 30 September 2017.

Further information about the tkm-Ordinance can be found on the following FOEN website:

[www.bafu.admin.ch](http://www.bafu.admin.ch) > Topics > Topic Climate > Information for specialists > Climate policy > Emissions trading

### Purpose of the monitoring plan

It is in the interest of aircraft operators to prepare a robust monitoring plan in order to ensure compliance with Swiss requirements. The monitoring plan is the reference tool for assessing whether aircraft operators are monitoring their tkm data in accordance with the requirements of the tkm-Ordinance. A verifier has to use your monitoring plan as reference point for verifying the monitoring report. The monitoring plan is thus the translation of the general requirements on monitoring and quality assurance which aircraft operators are required to implement. It contains references to underlying procedures intended to ensure that the reported data are complete, accurate and in line with all relevant provisions of the tkm-Ordinance.

The monitoring plan template provided by the FOEN is based on a template developed by the EU Commission for use in the EU ETS. The FOEN's template has been adapted to take account of the requirements of the tkm-Ordinance.

Before you draft your monitoring plan you are advised to check:

- whether you fall under the scope of application of the tkm-Ordinance;
- which flights have to be monitored by you as an aircraft operator.

## 2 Information about the scope of application of the tkm-Ordinance

### Scope of application of the tkm-Ordinance

*If you are an aircraft operator who ONLY operates flights that do NOT fall in the geographical scope of application of the tkm-Ordinance or that are subject to the exemptions laid down in the tkm-Ordinance, you are NOT required to compile a monitoring plan and to monitor and report data.*

In accordance with Article 3 of the tkm-Ordinance, the scope of application is as follows:

- Flights within Switzerland;

- Flights from Switzerland to countries of the European Economic Area (EEA), i.e. EU Member States, plus Iceland, Norway and Liechtenstein;
- Flights from Basel-Mulhouse to countries of the EEA, if they are classified as Swiss flights in accordance with the treaty between Switzerland and France dated 4 July 1949 on the construction and operation of Basel-Mulhouse Airport in Blotzheim;
- Flights between Switzerland and Basel-Mulhouse Airport, if they are classified as Swiss flights in accordance with the treaty between Switzerland and France dated 4 July 1949 on the construction and operation of Basel-Mulhouse Airport in Blotzheim.

All references to the EEA should be understood to include all 28 EU Member States, plus Iceland, Liechtenstein and Norway. Please note that special exemptions apply for outermost regions of the EU (cf. Annex to this Guidance).

Exempted flights in accordance with Article 3, paragraph 2 of the tkm-Ordinance:

- a. Flights performed exclusively for the transport on official mission of a reigning monarch and his/her immediate family, heads of state, heads of government and government ministers, where this is substantiated by an appropriate status indicator in the flight plan;
- b. Military, customs and police flights;
- c. Flights relating to search and rescue, fire-fighting flights, humanitarian flights and emergency medical service flights;
- d. Flights performed exclusively under visual flight rules as defined in Annex 2 to the Convention of 7 December 1944 on International Civil Aviation;
- e. Flights terminating at the aerodrome from which the aircraft has taken off and during which no planned intermediate landing has been made;
- f. Training flights performed exclusively in order to acquire or maintain a licence, or a rating in the case of cockpit flight crew, where this is substantiated by an appropriate remark in the flight plan provided that the flight does not serve for the transport of passengers and/or cargo, or for the positioning or ferrying of aircraft;
- g. Flights performed exclusively for the purpose of scientific research;
- h. Flights performed exclusively for the purpose of checking, testing or certifying aircraft or airborne or ground-based equipment;
- i. Flights performed by aircraft with a certified maximum take-off mass of less than 5,700 kilograms;
- j. Flights performed by commercial operators in each of three successive four-month periods if they carry out less than 243 flights in accordance with paragraph 1 or if their total annual emissions of CO<sub>2</sub> are below 10,000 tonnes;
- k. Flights performed by non-commercial operators if the total annual emissions of CO<sub>2</sub> from the flights carried out by these operators in accordance with paragraph 1 are below 1,000 tonnes.

If you had compliance obligations in the EU ETS in 2016, the exemptions in letters (j) and (k) do not apply.

For the allocation of flights to the four-month periods cited in letter (j) it is the local take-off time of each flight that is of relevance.

The guidelines below are intended to help you determine which of your flights are covered by the tkm-Ordinance.

*Exemption under letter (a)*

- This exemption is to be interpreted according to the exclusive purpose of the flight.
- Immediate family only comprises the spouse, any partner considered as equivalent to the spouse, the children and the parents.
- Government ministers are members of the government as listed in the national official journal of the country concerned. Members of regional or local governments of a country do not qualify for exemption under this subparagraph.
- An official mission is a mission in which the person concerned is acting in an official capacity.
- Flights for the positioning or ferrying of the aircraft are not covered by this exemption.
- Flights that Eurocontrol's Central Route Charges Office has identified for route charges exemption applicability (hereinafter CRCO exemption code) as 'S' are presumed to be flights performed exclusively for the transport, on official mission, of a reigning monarch and his/her immediate family, heads of state, heads of government and government ministers substantiated by an appropriate status indicator in the flight plan.

*Exemptions under letter (b)*

- Military flights are flights directly related to the conduct of military activities.
- Military flights performed by registered civil aircraft are not covered by this exemption. Similarly, civil flights performed by military aircraft are not exempted under subparagraph (b).
- Flights with the CRCO exemption code 'M' or 'X' are presumed to be exempted military flights.
- Customs and police flights performed by both civil and military aircraft are exempted.
- Flights with the CRCO exemption code 'P' are presumed to be exempted customs and police flights.

*Exemptions under letter (c)*

- In relation to the following categories of flights, flights for the positioning or ferrying of the aircraft and flights carrying exclusively equipment and personnel directly involved in providing the related services are covered by the exemption. Furthermore, these exemptions do not distinguish between flights performed through the use of public and private resources.
- Flights related to search and rescue are flights that provide search and rescue services. These services encompass the performance of distress monitoring, communication, coordination and search and rescue functions, and the provision of initial medical assistance or medical evacuation, through the use of public and private resources, including support aircraft, vessels and other craft and installations.
- Flights with the CRCO exemption code 'R' and flights identified with STS/SAR in field 18 of the flight plan are presumed to be exempted search and rescue flights.
- Firefighting flights are flights performed exclusively to provide aerial firefighting services, i.e. the use of aircraft and other aerial resources to combat wildfires.
- Flights identified with STS/FFR in field 18 of the flight plan are presumed to be exempted firefighting flights.
- Humanitarian flights are flights operated exclusively for humanitarian purposes which carry relief personnel and relief supplies such as food, clothing, shelter, medical and other items during or after an emergency and/or disaster, and/or are used to evacuate persons from a location where their life or health is threatened by such emergency and/or disaster and to transfer them to a safe location in the same country or another country consenting to receive such persons.

- Flights with the CRCO exemption code 'H' and flights identified with STS/HUM in field 18 of the flight plan are presumed to be exempted humanitarian flights.
- Emergency medical service flights are flights exclusively intended to facilitate emergency medical assistance, where immediate and rapid transport is essential by carrying medical personnel, medical supplies, including equipment, blood, organs, drugs, or ill or injured persons and other directly involved persons.
- Flights identified with STS/MEDEVAC or STS/HOSP in field 18 of the flight plan are presumed to be exempted emergency medical service flights.

*Exemption under letter (f)*

- Flights with the CRCO exemption code 'T' and flights identified with RMK/'Training flight' in field 18 of the flight plan are presumed to be exempted under subparagraph (f).

*Exemptions under letter (g)*

- In relation to the following categories of flights, flights for the positioning or ferrying of the aircraft are not covered.
- Flights performed exclusively for the purpose of scientific research.
- This category exempts flights, the sole purpose of which is to carry out scientific research. The scientific research must be partially or totally performed in-flight for the exemption to apply. The transport of scientists or research equipment is not in itself sufficient for a flight to qualify for exemption.

*Exemptions under letter (h)*

- Flights with the CRCO exemption code 'N' and flights identified with STS/FLTCK in field 18 of the flight plan are presumed to be exempted.

*Exemptions under letter (j): de minimis rule (l) for commercial operators*

- All commercial aircraft operators must hold an air operator's certificate (AOC) under Part I of Annex 6 to the Chicago Convention. Operators without such a certificate are not classified as 'commercial aircraft operators'.
- For the application of the *de minimis* rule in accordance with the tkm-Ordinance, the qualification of commercial is linked to the operator and not to the flights in question. This means in particular that the flights provided by a commercial operator have to be taken into account for deciding whether that operator falls above or below the exemption thresholds, even if those flights are not provided for remuneration.
- This *de minimis* rule (l) does not apply to commercial aircraft operators who have compliance obligations under the EU-ETS in 2016. These operators are required to submit a monitoring plan for all the flights falling under the scope of application of Article 3, paragraph 1 and Article 3, paragraph 2, letters (a) to (i), of the tkm-Ordinance.
- Only those flights that fall under the scope of application of the tkm-Ordinance have to be taken into account for deciding whether the aircraft operator falls above or below the exemption thresholds of the *de minimis* rule (l). Flights exempted under subparagraphs (a)-(i) are not taken into account.
- Flights performed by a commercial aircraft operator operating fewer than 243 flights per period for three consecutive four-month periods are exempted. The four-month periods are: January to April; May to August; September to December.
- Commercial operators operating flights with total annual emissions of less than 10,000 tonnes of CO<sub>2</sub> in 2016 are also exempted from the obligation to hand in a tkm monitoring plan. They

are required to estimate their emissions based on fuel consumption using a conservative calculation. The following formula may be used:

$$\text{Estimated annual emissions (tonnes of CO}_2\text{)} = \text{annual fuel consumption (tonnes)} \times \text{fuel emission factor (tonnes of CO}_2\text{/tonnes of fuel)}$$

Emission factor for kerosene = 3.16; emission factor for aviation and jet gasoline = 3.10

#### *Exemptions under letter (k): de minimis rule (II) for non-commercial operators*

- Non-commercial aircraft operators who have compliance obligations in the EU ETS in 2016 must not apply this *de minimis* rule (II) and are required to submit a monitoring plan for all flights that fall under the scope of application of the tkm-Ordinance.
- Only flights which fall under the scope of application of the tkm-Ordinance have to be taken into account for deciding whether the aircraft operator falls above or below the exemption thresholds of the *de minimis* rule (II). Flights exempted under subparagraphs (a)-(i) are not taken into account.
- Non-commercial operators operating flights with total annual emissions of less than 1,000 tonnes of CO<sub>2</sub> in 2016 are also exempted from the obligation to submit a tkm monitoring plan. They are required to estimate their emissions based on fuel consumption using a conservative calculation. The same formula as stated in the *de minimis* rule (I) should be used.

### **3 Information about the structure of this document**

This document describes the information you are required to include in the tkm monitoring plan. All relevant sections of the Swiss monitoring plan template must be completed unless the template specifically states that a particular section is not applicable to you. The following information is arranged according to the numbering system in the Swiss monitoring plan template.

#### **4 Section 1 of the monitoring plan: list of versions**

The aim of this section is to provide an audit trail of monitoring plan versions. It keeps track of the current version of the monitoring plan and identifies any amendments that have been made.

#### **5 Section 2 of the monitoring plan: identification of aircraft operator**

**Section 2** of the monitoring plan template requires you to submit information that will identify you as an aircraft operator. The objective is to inform the FOEN what sort of aviation activities you carry out, what the legal status of your operation is and what your operations are.

You are asked to enter the name of the aircraft operator under **section 2 (a)**. The name that is to be provided in this section is that of the legal entity who operates an aircraft at the time it performs an aviation activity falling under the scope of application of the tkm-Ordinance (cf. Article 2).

Only enter your aircraft operator name in **section 2 (e)** as it appears on the EU Commission's list of aircraft operators (Commission Regulation (EU) 2017/294)<sup>3</sup> if it is different and if you performed flights covered by the EU ETS in 2016, enter in **section 2 (e)**

In **section 2 (b)** you are required to enter your unique identifier as stated in the EU Commission's list of aircraft operators if you had compliance obligations in the EU ETS in 2016.

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<sup>3</sup> Please also check the website of the European Commission for the most up-to-date version: <https://ec.europa.eu/clima/policies/ets/monitoring/operators> > Documentation

### **Section 2 (f): ICAO designator**

If applicable, you are required to enter your unique ICAO designator used as call sign for Air Traffic Control (ATC) purposes. The designator is as entered in box 7 of the ICAO flight plan (the 3-letter code, which excludes the flight identifier).

If you do not have an ICAO designator, please select "n.a" from the drop-down list.

### **Section 2 (g): Aircraft registration marks**

This section should only be completed if you do not have a unique ICAO designator. In this case you are required to enter the aircraft registration marks (tail numbers) for all aircraft you operate (as entered in box 7 of the flight plan). Please list all the aircraft registration marks that are valid within the fleet at the time of submission of the monitoring plan.

### **Section 2 (h): Air Operator Certificate (AOC) and Operating Licence**

In this section you are required to state the AOC number and the AOC issuing authority, as well as the Operating Licence number and the issuing authority, if applicable.

Non-commercial operators do not hold an AOC or Operating Licence and therefore do not need to enter any details in this section.

### **Section 2 (k): Ownership structure of your firm**

In this section you are required to describe the ownership structure of your firm, including the unique ICAO designator of any subsidiaries or parent company (or registration marks if an ICAO designator is not available). Add attachments to your monitoring plan as necessary to include a diagram of your ownership structure. The diagram can be set up on a high level basis.

### **Section 2 (l): Scope of activities**

Using the drop down boxes, identify what best describes the scope of your activities. Commercial operators must submit a copy of Annex 1 of their AOC together with the monitoring plan.

## **6 Section 3 of the monitoring plan: contact details and address for deliveries**

### **Section 3 (a): Contact details**

In this section, please enter the details of the person who can be contacted should the FOEN have any technical or administrative queries regarding the monitoring plan submission. This should be someone who has been involved in either completing the plan or coordinating the data entry.

If the person is acting on behalf of the aircraft operator (e.g. as a consultant) then the name of his/her organisation name should be provided. This would also be applicable if you outsource the drafting of your monitoring plan.

### **Section 3 (b): Address for deliveries**

In this section, please enter a contact name and address for the delivery of notifications or documents (relating to the Swiss federal legislation). Please provide both an electronic and a postal address, if possible within Switzerland.

## **7 Section 4 of the monitoring plan: details of your operations**

### **Emission sources and fleet characteristics:**

The tkm-Ordinance requires you to include all flights falling within its scope of application in the monitoring and reporting process. This means that you have to exclude all flights that are not covered by the tkm-Ordinance.

Section 2 (Information about the scope of application of the tkm-Ordinance) of this guidance explains how you can determine which flights are covered and which are not. To prevent double counting and to ensure that all relevant flights are reflected in the data that will be reported in the tkm report, aircraft operators are required to complete section 4 of the tkm monitoring plan.

#### **Section 4 (a): List of aircraft types**

The aim of the first table in this section is to provide a list of aircraft types that you are operating at the time of submission of the monitoring plan. A field is provided to enter the date of submission. Each aircraft type should be identified by its ICAO alphanumeric aircraft type designator (e.g. A332 is the type designator for an Airbus A330-200). A complete list of ICAO aircraft type designators can be found on the following website:  
<http://www.icao.int/publications/DOC8643/Pages/default.aspx>

The template allows you to further specify sub-types of the aircraft type you have entered in the first column. This might be relevant in defining the specific monitoring methodology for new and old versions of the same generic aircraft type, each with different on-board systems. For example, an older B742 aircraft type might use manual data transmission, whereas a new B742 sub-type might have ACARS as its data transmission system.

Enter in the list the number of each generic aircraft type at the time of submission of the monitoring plan. Note: the number entered should include any leased-in aircraft for which you are the aircraft operator.

Enter the registration marks (tail numbers) of all aircraft, if available.

#### **Section 4 (b): Indicative list of additional aircraft types**

This section requires you to provide an indicative list of additional aircraft types that you expect to operate and for which you are the aircraft operator (aircraft types operated under your ICAO designator or if this is not available your registration marks). The objective of this section is to enable an aircraft operator to provide details of aircraft types which are currently not part of their fleet, but might be in the foreseeable future. This would reduce the requirement for regular updates of the monitoring plan. If an aircraft operator cannot foresee the use of certain aircraft types based on future plans (or historic activities in the case of leased-in aircraft), then this table should be left blank.

This table must not include the same generic aircraft types identified in table 4 (a). For example, if you expect to purchase or lease-in additional B742 aircraft and have already identified this aircraft type in table 4 (a), then table 4 (b) should remain empty.

You are required to make as accurate an estimate as possible of any additional aircraft types which you expect to operate after submitting your monitoring plan. Discrepancies between actual data concerning aircraft types used and the data that you have listed in this section will not lead to non-conformities in the verification process or enforcement. If available, please also enter the registration marks of the additional aircraft expected to be used during the monitoring year.

#### **Section 4 (c): Procedures for tracking completeness of emission sources (aircraft used)**

You are required to implement a procedure for tracking the completeness (including registration and deregistration) of any aircraft you operate and for which you are the aircraft operator (aircraft operated under your ICAO designator, or if this is not available your registration marks). The objective of this procedure is to ensure that all these aircraft are included in your systems and end up in your tkm report. The procedure must guarantee that all

these aircraft are recorded in your internal systems and that this list is available, accurate and up to date. The list should include all aircraft for which you are the aircraft operator. This involves any code shares or leased-in aircraft where applicable, since the ICAO designator is the determining factor for identifying whether the aircraft falls under your responsibility.

Where applicable, you may refer to the list of aircraft associated with your AOC, provided that this list is accurate, complete and contains all aircraft you operate and for which you are the aircraft operator. The procedure should also identify how you account for any aircraft in your fleet for which you are not the aircraft operator, to ensure that this information is not reported as part of your tkm data.

#### **Section 4 (d): Procedures for tracking completeness of the list of flights**

You are required to implement a procedure to ensure that all flights falling under the tkm-Ordinance which you operate under your responsibility as aircraft operator, and the associated departure and destination aerodromes are captured and recorded in a list or in your internal systems. The tkm report calls for data to be aggregated by aerodrome pair.

The procedure must ensure that the list of flights and aerodrome pairs is kept up to date, is complete and does not contain duplicate data. The procedure should indicate which flight related information is contained in your internal systems (such as flight number, flight routes, departure and destination aerodromes, etc.).

In addition, this procedure has to ensure that you can identify the flights for which you are responsible as aircraft operator (flights under your ICAO designator or, if this is not available, your aircraft registration marks). For example, a generic description that all wet leases always fall always under your ICAO designator may be sufficient, provided that you are able to trace all wet lease operations and that these are recorded separately as such in your system. This will enable the verifier and the FOEN to check that flights not operated under your ICAO designator have been excluded from the reported data.

Please note that, when recording data relating to the performed flights, you have to take the actual, rather than planned, flight details into account. For example, if a planned flight from Zurich to London is diverted to Amsterdam, this should be recorded as a flight from Zurich to Amsterdam.

#### **Section 4 (e): Procedures for determining whether performed flights are covered by the tkm-Ordinance**

You are required to implement a procedure for determining which flights are covered by the tkm-Ordinance, ensuring completeness and avoiding double counting. The objective of this procedure is to ensure that flights which are not covered are not included in the tkm report and that flights that are covered are not incorrectly excluded from your tkm report.

The procedure must ensure that all flights that are excluded from the scope of application of the tkm-Ordinance are not included in your tkm report.

### **8 Section 5 of the monitoring plan: distance data**

#### **Section 5 (a): Confirmation of the latitude and longitude of aerodromes**

You are required to use the latitude and longitude of aerodromes either from the location data published in Aeronautical Information Publications (hereinafter "AIP") in compliance with Annex 15 of the Chicago Convention, or from a source using such AIP data. In this section you are required to confirm that you are using such data.

#### **Section 5 (b): Methodology or data source used to determine distance**

Distance must be calculated using the following formula:

$$\text{Distance [km]} = \text{great circle distance [km]} + 95 \text{ km}$$

Great circle distance (GCD) is defined as the shortest distance between any two points on the surface of the Earth, which is approximated by using the WGS84 system (referred to in Article 3.7.1.1. of Annex 15 to the Chicago Convention). The two points are the aerodrome of departure and the aerodrome of destination.

You are required to describe the methodology and data source used for calculating the GCD for each aerodrome pair. You will need to demonstrate that your calculations are derived from the GCD approximated using the WGS84 ellipsoid. You also have to show how distances are calculated (e.g. via internal calculations or the use of third-party software). If you calculate the distance using third-party software, you must show that you have taken steps to ensure that the calculation methodology is based on the WGS84 system and AIP data.

### **Section 5 (c): Systems and procedures for monitoring aerodrome location data**

Please use the most up-to-date AIP data as of 31 December 2018 to calculate your tkm data for 2018.

To ensure that you are using the correct AIP data, you are required to implement systems and procedures for monitoring aerodrome location data. This means that you are required to describe the procedures you have in place for monitoring aerodrome location information and for ensuring that the AIP data are recorded in your system and that AIP data that are valid on 31 December 2018 are used.

If no AIP data are available regarding non-standard aerodromes, the aerodrome location coordinates have to be registered by you and updated if they should change. In this section you are also required to describe how aerodrome location coordinates have been obtained.

In many cases, aircraft operators will have access to information sources containing the location of aerodromes based on AIP data. The master data in your internal systems will have to be updated. The procedure and systems you have in place for monitoring AIP data should ensure this. Your system and procedure should define the procedural steps used to incorporate a new aerodrome location procedure to guarantee that the AIP data used for calculating the distance are up-to-date and accurate.

Systems for monitoring the aerodrome location data can also be maintained and kept up to date by a third party (e.g. an IT supplier). If you outsource the monitoring of aerodrome location data, you are still responsible for their correctness and accuracy. You should therefore control the quality of these processes by defining appropriate requirements for outputs, and review the quality delivered by the third-party provider (cf. section 9 (e) of the monitoring plan).

### **Section 5 (d) Procedure for monitoring the great circle distance between aerodrome pairs:**

You are required to show that you have adequate systems and procedures in place for monitoring the great circle distance (GCD) between aerodrome pairs. In this section of the template you have to describe the systems and procedures for ensuring that AIP data are used for the calculation of the GCD. They should also describe which aerodrome coordinates you use as input data.

Note that the GCD does not correspond to the actual flight route.

If you use a third-party system to calculate the GCD between aerodrome pairs, you should control the quality of these processes by defining appropriate requirements for outputs, and review the quality delivered by the third-party system. You should ascertain that the tool used is properly designed, tested, controlled and maintained to ensure reliable, accurate and timely processing of data.

## 9 Section 6 of the monitoring plan: payload (passengers and checked baggage)

Please use the following formula to calculate payload:

$$\text{Payload [t]} = \text{mass of passengers and checked baggage [t]} + \text{mass of freight and mail [t]}$$

[t] = metric tonnes

### Section 6 (a): Method for determining the mass of passengers and checked baggage

The mass of passengers and their checked baggage must be determined by one of the following options:

- *Option 1:* Default value. A default value of 100 kg for each passenger and his/her checked baggage is used.
- *Option 2:* The mass recorded in the mass and balance documentation (actual or standard mass)

The mass for passengers and checked baggage recorded in the mass and balance documentation for each flight is used.

You are free to choose either option. However, once you have chosen an option and confirmed this in your monitoring plan, you are required to apply that option to all flights within the same trading period.

Mass and balance documentation is also referred to as weight and balance documentation. Specific provisions governing mass and balance documentation are stipulated in 'EU OPS' (Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation). Equivalent regulations also contain provisions governing mass and balance documentation for non-Swiss or non-EU operators. The passenger mass used in the mass and balance documentation can either be the appropriate standard mass value or the actual mass as determined by measurement of each passenger.

Similarly, the mass of checked baggage recorded in the mass and balance documentation can either be the appropriate standard mass value for baggage or the actual mass determined by measurement.

In most cases, it is expected that the standard mass will be applied which can be:

- the standard mass as specified in the EU OPS or equivalent international regulation, or
- depending on the applicable legislation, the standard mass as approved by the appropriate civil aviation authority

Actual mass recorded in the mass and balance documentation has to be weighed according to the provisions stipulated in the EU OPS or equivalent international regulation. You do not have to carry out a detailed uncertainty assessment if you are determining the actual mass.

All commercial air transport operators are required to produce mass and balance documentation in accordance with the applicable regulations. This means you are at liberty to choose between option 1 and option 2 as explained above. If you do not possess mass and balance documentation you are required to choose option 1 (default value) for all flights.

### 6(b): Source of mass and balance data

This section applies only if you have selected option 2.

Here you are required to indicate which standard weights cited in your mass and balance documentation are used, i.e. whether you have used the standard weights for men, women, children and infants as specified in the EU OPS or equivalent international regulation, or

whether you use standard weights approved by the relevant civil aviation authority. You are required to specify for which type of flights you use the standard mass and, if applicable, whether these have been approved by the civil aviation authority. You are also required to do this for checked baggage.

If you are using the actual mass in the mass and balance documentation for specific flights, you are required to describe for which type of flights the actual mass is used, and which sort of measurement equipment you have used to measure the mass of passengers and checked baggage. The information concerning measurement equipment may take the form of a general description.

### **Section 6 (c): Procedure for monitoring the number of passengers on a flight**

To ensure that the correct number of passengers on a flight is indicated, you are required to implement an appropriate procedure.

The term “passenger” refers to all persons (children and adults) on board the aircraft during a flight, excluding the active crew. You are required to ensure that the actual data concerning the number of passengers is recorded in your internal systems and used for drafting your tkm report. Note: the system for determining passenger numbers should exclude those passengers booked on flights but who do not board the aircraft.

Crew members on active duty are not classified as passengers. They must be excluded from the payload and should not be taken into account in the reported data. Positioning crew members who are not on duty should be regarded as passengers.

The procedure for monitoring the number of passengers must at least indicate:

- which data sources are used to determine the number of passengers and their checked baggage
- who is responsible for monitoring the number of passengers and their checked baggage
- which procedures are used for ensuring that the correct number of passengers and their checked baggage is recorded and, if applicable, that the actual weighed mass is accurate and reliable (e.g. calibration, or alternative control activities if calibration is not possible). This includes procedures for recording how crew members on active duty and their baggage are excluded from the reported tkm data
- the information system used for processing and transmitting the number and mass of passengers and their baggage
- whether and how data relating to mass and the number of passengers are entered manually in systems
- how and where the data relating to mass and the number of passengers and their checked baggage are recorded

## **10 Section 6 of the monitoring plan: payload (freight and mail)**

The mass of freight and mail has to be calculated using the actual or standard mass recorded in the mass and balance documentation for the relevant flights. Some aircraft operators may not be required to have a mass and balance documentation, in which case they are required to propose an alternative methodology.

### **Section 6 (d): Requirement to keep mass and balance documentation (freight and mail)**

In this section you are required to state whether you are legally required to keep mass and balance documentation for the relevant flights.

Mass and balance documentation for a flight is a requirement for commercial operators in accordance with the EU OPS or equivalent international regulations. The actual mass has to be calculated in accordance with these regulations, or the standard mass as specified in these regulations has to be used.

### **Section 6 (e): Suitable monitoring methodology if no mass and balance documentation is required**

In this section, if you are not required to keep mass and balance documentation you must propose a suitable methodology for calculating the mass of freight and mail and how the data are acquired, transmitted and subsequently recorded.

### **Section 6 (f): Description of measurement devices**

If you are weighing the mass of freight and mail, please provide a brief description of the utilised measurement devices. Your description should include the type of weighing devices (e.g. weighbridges, weighing platforms, etc.) and cite the calibration standards and margins for error.

If you have outsourced weighing to ground handling service providers, please indicate this here. In this case you should describe how you ensure that the utilised measurement devices are sufficiently accurate (e.g. through clauses in contracts). Should you make use of standard weights for your mass and balance documentation (e.g. standard weights for mail bags), you should give a brief description of this here.

### **Section 6 (g): Confirmation of exclusion of pallets, containers and service weight**

You are required to exclude the tare weight of all pallets and containers that are not part of the payload and service weight from the actual freight and mail mass.

Payload is defined as the total mass of freight, mail, passengers and baggage carried on board the aircraft during a flight.

Containers and pallets that take the form of unit load devices usually display IATA markings such as type codes, maximum gross weights and tare weight. The tare weight of these devices must be excluded from the reported mass of freight and mail if they are not part of the consignment. In this case they cannot be considered as payload. However, unit load devices that form an integral part of the consignment are considered as payload and should be included in the reported freight and mail mass.

Service weight includes catering and removable passenger service equipment, as well as potable water and lavatory chemicals. Service weight is not included in the payload.

In this section you are required to confirm that the actual freight and mail mass excludes the tare weight of pallets and/or containers that are not included in the payload or service weight.

### **Section 6 (h): Procedures for monitoring the mass of freight and mail**

To ensure that the correct (net) mass is used to calculate the payload, you have to implement procedures for monitoring the mass of freight and mail.

If you use the actual mass contained in the documentation, the procedure should describe how the actual mass is weighed and how the data are acquired, transmitted and stored in your internal system. Actual mass has to be weighed in accordance with the provisions stipulated in the EU OPS or equivalent international regulation. If you use the standard mass contained in the documentation, the procedure should describe which standard masses are used and how they are recorded in your internal system.

In your description of the procedure, please explain how the mass of containers is subtracted (i.e. how the net weight is calculated). Your procedure should also explain how service weight and tare weight of pallets and containers are excluded from the actual mass, and guarantee

that checked baggage is not double counted in the monitoring of mass and freight. Furthermore, you have to ensure that actual data relating to the mass of freight and mail are recorded in your internal systems and used for drafting your tkm report.

To sum up, the procedure must at least indicate:

- which data sources are used to determine the mass of freight and mail (how to determine the gross weight, net weight, etc.) and which steps are taken from measurement of the mass to recording this information in your internal systems
- who is responsible for monitoring the mass of freight and mail
- which procedures are implemented to ensure that the correct mass is used to calculate the payload. This includes procedures for excluding the tare weight of containers and pallets, and the service weight, from the payload
- the information system used for processing and transmitting the mass of freight and mail
- whether and how data concerning mass of freight and mail are entered manually into your systems
- how and where the data relating to the mass of freight and mail are recorded

## **11 Section 7 of the monitoring plan: management**

### **Section 7 (a): Roles and responsibilities**

Please identify the key job titles/positions within your organisation with a formal responsibility for monitoring and reporting, and provide a concise description of their role in relation to implementing the monitoring plan.

You may use the additional lines to describe other positions that you feel are relevant. You should only include those functions or positions with a direct role in implementing the monitoring and reporting plan. Please use job titles or functions (e.g. "OCC manager") where possible and do not cite names of individuals.

### **Section 7 (b): Assignment of responsibilities and competences**

You are required to assign responsibilities for monitoring and reporting activities. Where possible, conflicting duties should be segregated, including data handling and control activities, otherwise alternative controls should be put in place.

## **12 Section 8 of the monitoring plan: data flow activities**

Aircraft operators are required to create, document, implement and maintain written procedures for data flow activities for the monitoring and reporting of tkm data, and to ensure that the tkm report resulting from data flow activities does not contain misstatements and is in conformity with the monitoring plan.

Descriptions of written procedures for data flow activities in the monitoring plan should encompass at least the following elements:

- identification of the primary data sources;

- each step in the data flow from primary data to tkm data which reflects the sequence and interaction between the data flow activities;
- the relevant processing steps related to each specific data flow activity, including the formulae and data used to determine the tkm data;
- the utilised electronic data processing and storage systems, as well as the interaction between those systems and other inputs, including manual ones;
- the way in which outputs of data flow activities are recorded.

### Additional information: how to set up data flows

Data flow activities should be set up in such a way that there is a clear linkage with the previous and the next activity. The sequence and interaction between those activities should be clear. This could be achieved by mapping the data flow activities in the form of a diagram or flow chart.

You may want to consider drawing up two separate data flow diagrams if you have more than one standard data flow procedure – for example, if some aircraft are equipped with a direct data link from on-board IT to a central system, but other aircraft require paper copies of flight documentation and a manual link.

The following sample data flow charts from the EU Commission might be helpful:

[EU Commission: Passenger-freight data-flow manual](#)

[EU Commission: Passenger-freight data-flow standard](#)

The steps listed below are intended to help you to set up a data flow and complete the required sections in your monitoring plan.

| Step          | Explanation of how to set up data flows   |
|---------------|---|
| <i>Step 1</i> | <ul style="list-style-type: none"> <li>• understand the FOEN's monitoring and reporting requirements</li> <li>• understand which flights you have to monitor</li> <li>• understand which specific data are needed for monitoring</li> <li>• understand which data have to be accurately reported in your tkm report</li> <li>• understand where data are currently kept and what their primary sources are</li> </ul> <p>You should, for example, have a clear understanding of what is meant by passengers, which weight data should be used, which mass data are required and whether the sources for these data contain all the information required for monitoring.</p> |
| <i>Step 2</i> | <ul style="list-style-type: none"> <li>• identify what steps in the data flow are necessary to produce the required tkm report</li> <li>• assess which of these are (fully/partially) common practice and what further effort is required to implement these steps</li> <li>• identify what needs to be changed in your current data management system, including data from external sources</li> </ul> <p>You will need to have a clear understanding of the extent to which operator-specific circumstances apply, and deal with them appropriately.</p>  |
| <i>Step 3</i> | <p>Map your data flow diagrams.</p> <ul style="list-style-type: none"> <li>• each block in the flow diagram should reflect a distinct activity. Apply a chronological order</li> <li>• responsibility for each task should be allocated to a specific person (job title/</li> </ul>   |

|               |   |
|---------------|---|
|               | <p>position), be based on a clear source and lead to a traceable result (record)</p> <ul style="list-style-type: none"> <li>• clearly identify the systems/databases that are involved</li> <li>• draw up instructions and explanatory texts to enable a sufficient level of understanding on the part of the users of the data flow diagrams (e.g. responsible personnel and verifiers)</li> </ul>   |
| <i>Step 4</i> | <p>Make sure that your new data flow diagrams reflect actual practice.</p> <ul style="list-style-type: none"> <li>• update internal roles, responsibilities and procedures</li> <li>• implement new or adjusted data management systems (electronically and manually)</li> </ul>  |
| <i>Step 5</i> | <p>Develop procedures for the data flow activities These procedures should at least describe the following elements:</p> <ul style="list-style-type: none"> <li>• which tasks and/or actions are performed in the activity concerned</li> <li>• the responsible person (job title) for each data flow activity</li> <li>• the information system used for processing and implementing a particular data flow activity</li> <li>• the frequency with which a particular data flow activity is carried out</li> <li>• how and where the data flow activity is recorded</li> </ul> |
| <i>Step 6</i> | <p>Complete the table detailing your data flow activities in section 8 (a) of the tkm monitoring plan.</p> <p>Attach a depiction of the data flow for tkm data in section 8 (b).</p>  |

### 13 Section 9 of the monitoring plan: control activities

You are required to implement control activities to mitigate the risks of misstatements in the tkm report, as well as to eliminate non-conformities. Control activities need to be defined depending on the outcome of your risk assessment, in order to ensure a proper and cost efficient focus of your efforts.

Control activities to be implemented include:

- 9 (a): Identification of inherent risks and control risks;
- 9 (b): Quality assurance of the measurement equipment and information technology;
- 9 (c): Internal reviews and validation of data;
- 9 (d): Corrections and corrective actions;
- 9 (e): Outsourced activities;
- 9 (f): Records and documentation.

To ensure that the control activities are effective, and in order to reduce the risk that ineffective controls could lead to misstatements and non-conformities, you are required to set up written procedures for these control activities. Please be aware that the control activities have to be carried out in accordance with the risk based approach.

#### Section 9 (a): Identification of inherent risks and control risks

Once you have set up all required data flow diagrams in section 8 (b), you should assess the risks relating to misstatements and non-conformities. The following steps may be helpful here:

- *Step 1:*  
For each activity, identify the risks of non-conformity with the monitoring plan and misstatements / mismatches between actual performance and reported data. These

are *inherent risks*, i.e. risks assuming no controls have yet been put in place. After the control activities have been identified, the risk assessment should also apply to these activities in order to ensure their effective operation. This is referred to as *control risk*, i.e. the risk that ineffective controls could lead to misstatements or non-conformities.

- **Step 2:**  
Assess the identified risks by determining their probability (low, medium or high) and potential impacts (low, medium or high). One method of numerically determining the level of risk is to assign a score (low=1, medium=2, high=3) to both the probability and the impacts, and then assess the risk as the product of the probability multiplied by the impacts.

To ensure that the risk assessment is carried out accurately, you should set up a written procedure for the assessment of inherent and control risks in **section 9 (a)**. This risk assessment will need to be updated whenever there are significant operational changes or if it appears to be insufficiently effective.

### **Section 9 (b): Quality assurance of the measurement equipment and information technology**

If you use measurement instruments to determine your payload, for example, you have to calibrate, adjust and check these measurement instruments in accordance with the applicable standards. For this purpose you should refer to maintenance plans and routine aircraft maintenance procedures.

If measurement instruments cannot be (re-)calibrated, you are required to propose alternative control activities. If your measurement instrument is not functioning properly, you have to take immediate action to rectify this.

If you use IT data links to transmit your data from the aircraft to your internal systems, and you use IT systems to analyse, process, calculate and store these data, you have to ensure that these systems are designed, tested, implemented, controlled and maintained in such a way that reliable, accurate and timely processing of data is guaranteed. The control of information technology must encompass access control, back up, recovery, continuity planning and security.

### **Section 9 (c): Internal reviews and validation of data**

For the management of the data flow, you are required to design and implement internal reviews of defined data sets throughout the data flow process. Examples of internal reviews include horizontal checks between several systems containing same or comparable data, plus vertical checks, trend analysis, plausibility checks, etc.

Horizontal checks could include:

- planned versus actual data (for passengers, freight and mail)
- flights invoiced by Eurocontrol versus flights recorded in operations

Vertical checks / trend analyses could include:

- occupancy rates
- transported passengers versus sold tickets

Note that these examples are not exhaustive and that other control activities may replace reviews of data, depending on the outcome of the risk assessment. Internal reviews are, however, usually among the most effective control activities (e.g. reducing the risk that individual data gaps could occur). These internal reviews may be conducted either manually or electronically, and should be recorded for internal audits and verification.

### **Section 9 (d): Corrections and corrective actions**

If any part of the data flow activities or control activities (device, equipment, staff member, supplier, procedure or other) is found to not function effectively or to only function outside the set boundaries, you have to correct the data. You are required to assess the validity of the outputs through internal reviews, determine the root cause of the malfunction or error, and take appropriate corrective action.

#### **Section 9 (e): Outsourced processes**

If you outsource any processes in the data flow (e.g. using an external tool to calculate the GCD, weighing of baggage and freight at aerodromes, etc.), you have to control the quality of these processes and the reliability of their outcome. You should specify appropriate requirements for your inputs and your methods for reviewing the quality delivered for each dataset or activity that you have outsourced. This could include clauses in contracts stipulating accuracy standards.

#### **Section 9 (f): Records and documentation**

To be able to show and ensure compliance, as well as to reconstruct reported tkm data, you have to keep records of all control activities, information related to the monitoring methodology, and all information required for the verification of tkm reports.

#### **Section 9 (g): Environmental management system**

You are required to indicate whether your organisation has a documented environmental management system. Please select the appropriate answer from the pull down menu.

#### **Section 9 (h): Certification of environmental management system**

If the environmental management system is certified by an accredited organisation and the system incorporates procedures relevant to the monitoring and reporting of tkm data, please specify the applicable standard (e.g. ISO14001, EMAS), in the yellow box.

### **14 Section 10 of the monitoring plan: list of definitions and abbreviations**

To aid the review process you are required to define any abbreviations you may use in your tkm monitoring plan.

### **15 Section 11 of the monitoring plan: additional information**

You are requested to identify and reference any additional documentation that you submit as part of your plan, which you wish the FOEN to take into account when making its assessment. This information must be supplied in the appropriate electronic format and be clearly referenced.

### **16 Concluding remarks**

#### **Changes to your monitoring plan**

After you have submitted your tkm monitoring plan, changes may occur in your operation, monitoring methodology and procedures. If there are changes to your monitoring methodology, you are required to notify the FOEN and update your monitoring plan. If your status changes from "commercial" to "non-commercial" or vice versa, your monitoring plan must be re-evaluated by the FOEN.

**Annex: Flights subject to the provisions of the tkm-Ordinance (outermost regions of the EU)**

Please note that the following territories of EU Member States form part of the EEA and are subject to the provisions of the tkm-Ordinance:

|    |                   |
|----|-------------------|
| ES | Ceuta and Melilla |
| FI | Aland Islands     |
| NO | Jan Mayen         |
| UK | Gibraltar         |

Flights between any aerodromes in Switzerland and offshore installations of EEA countries that are outside territorial waters, such as oil and gas production or exploration platforms, also are subject to the provisions of the tkm-Ordinance.

**Flights that are not subject to the provisions of the tkm Ordinance**

Flights from Switzerland to outermost regions of the EU (in accordance with Article 349, Treaty on the Functioning of the European Union) are not subject to the provisions of the tkm-Ordinance in line with the exemptions proposed by the EU Commission on 3 February 2017<sup>4</sup> regarding the scope of application of the EU ETS as of 1 January 2017.

Currently, the nine outermost regions are:

|    |   |
|----|---|
| ES | Canary Islands  |
| FR | French Guiana<br>Guadeloupe<br>Martinique<br>Mayotte<br>Réunion<br>Saint-Martin |
| PT | Azores<br>Madeira   |

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<sup>4</sup> [Proposal for a Regulation amending Directive 2003/87/EC to continue current limitations of scope for aviation activities and to prepare to implement a global market-based measure from 2021. COM \(2017\) 54 of 3 February 2017.](#)

Please note that the following (overseas) countries and territories of EU Member States do not form part of the EEA and not subject to the provisions of the tkm-Ordinance:

|    |   |
|----|---|
| DK | Greenland<br>Faeroe Islands   |
| FR | French Polynesia<br>New Caledonia<br>Saint Barthélemy<br>Saint Pierre and Miquelon<br>Wallis and Futuna   |
| NL | Aruba<br>Bonaire<br>Saba<br>Sint Eustatius<br>Curaçao<br>Sint Maarten   |
| NO | Svalbard  |
| UK | Anguilla<br>Bermuda<br>British Antarctic Territory<br>British Indian Ocean Territory<br>British Virgin Islands<br>Cayman Islands<br>Falkland Islands<br>Bailiwick of Guernsey<br>Isle of Man<br>Jersey<br>Montserrat<br>Pitcairn, Henderson, Ducie and Oeno Islands<br>Saint Helena<br>Ascension and Tristan da Cunha<br>South Georgia and the South Sandwich Islands<br>Turks and Caicos Islands<br>Akrotiri<br>Dhekelia |

Please also consult the [Frequently Asked Questions on the 2013-2016 Regulation amending the EU ETS for aviation](#) (EU Commission, 30 April 2014).