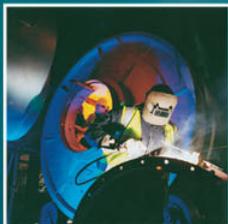
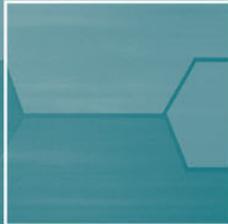


# European Commission

## MRV Guidance for aviation in the EU ETS

Tonne kilometre data  
Draft Technical Report

September 2008



# Entec

*Creating the environment for business*

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## European Commission

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Entec UK Limited

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## Executive Summary

This report has been produced to provide a technical evidence base to support the European Commission in developing guidelines for the monitoring, reporting and verification (MRV) of tonne-kilometre data by aircraft operators in the European Union Emissions Trading Scheme (EU ETS). The report outlines key technical issues, suggests preferred technical solutions and supports the guidelines found in the proposed draft Commission Decision. The final form of guidance will depend on consultation, final wording in the legislation and wider issues.

This report assumes that the current proposals are in force. However, the reader should be aware that at the time of writing, the legislation was still under negotiation in the codecision procedure, so any future changes should be taken into account when reading this report. The European Parliament's position on the proposed amendment to Directive 2003/87/EC to include aviation in the EU ETS, adopted on 8 July 2008, is the legislative basis for recommendations outlined in this report. This document is referenced accordingly.



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## 1. Introduction

### 1.1 Project overview

On 20 December 2006 the European Commission adopted a proposal for a Directive<sup>1</sup> to amend Directive 2003/87/EC<sup>2</sup> (the EU ETS Directive) so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community. The Commission's proposal is subject to the codecision procedure. The Council has already sent its common position to the European Parliament, which has approved with amendments the proposed Directive in its second reading through legislative resolution of 8<sup>th</sup> of July 2008<sup>3</sup>. It is expected that the Council will shortly adopt the proposal as approved by the European Parliament and therefore the adopted text will soon become a Directive and enter into force.

Aircraft operators would then be required to surrender sufficient allowances to account for their verified emissions. Under the scheme, aircraft operators will also be able to apply for free allocations of allowances at the start of the reporting period by submitting verified activity data for a baseline year.

The proposed Directive is subject to codecision by the European Parliament and the Council and has not yet been finally approved. However, in anticipation of its adoption, the Commission is preparing for its implementation and the aim of this project is to assist this.

Monitoring, reporting and verification (MRV) are crucial to the functioning of the EU ETS and key to its environmental effectiveness. The objectives of the study are the following:

- To provide the Commission with assistance in the development of monitoring, reporting and verification guidelines for aviation's inclusion in the EU ETS;

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<sup>1</sup> COM (2006) 818 - Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community

<sup>2</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC

<sup>3</sup> 2006/0304 (COD) - European Parliament legislative resolution of 8 July 2008 on the Council common position for adopting a directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community



- To identify any necessary changes to the general monitoring and reporting guidelines<sup>4</sup> applying to all sectors included in the EU ETS from 2008 and to propose options for additional draft guidelines specific to aviation activities;
- To provide for an open consultation phase.
- As set out above, there are two elements to monitoring, reporting and verification for aviation's inclusion in the EU ETS.
  - MRV of tonne-kilometre data – When aircraft operators apply for their allowances, they will have to submit verified tonne-kilometre data for their aviation activities for a reference year;
  - MRV of annual emissions – Throughout each compliance year, aircraft operators will have to monitor their emissions and then submit a verified emissions report at the end of the year.

This report considers the issues surrounding the MRV of **tonne-kilometre data**. A separate report considers the MRV of annual emissions data.

## 1.2 Structure of the report

The report begins by setting the context for MRV and the requirements for aircraft operators, Member States, competent authorities and the European Commission. It then examines the more technical aspects of MRV and proposed new guidance before considering the costs of collating and submitting baseline data.

The report is split into sections covering each of these issues as follows:

- Legislative requirements;
- Overview of application process;
- Guidance structure;
- Issues for guidance and a summary of guidance;
- Administrative Costs;
- Stakeholder Feedback (for final report).

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<sup>4</sup> Commission Decision 2007/589/EC of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/CE.



## 1.3 Overview of approach

The aviation proposal establishes a process for a consistent EU-wide approach to allocating allowances to the aviation sector. For other sectors, Member States have decided allocation methods through their National Allocation Plans (NAPs).

Therefore, previously there has been no EU-level guidance on the monitoring and reporting of activity data (which in the case of aviation is tonne-kilometre data). However, there is existing guidance on the monitoring and reporting of annual emissions data.

Although the guidance required for tonne-kilometre data has some differences to that required for annual emissions data, the established principles of MRV (Box 1) are generic and their spirit has been applied in developing guidance of tonne-kilometre data.

### Box 1 Key principles of Monitoring, Reporting and Verification of annual emissions

**Completeness.** Monitoring and reporting should cover all process and combustion emissions from all emission sources and source streams belonging to activities listed in Annex I to Directive 2003/87/EC and of all greenhouse gases specified in relation to those activities while avoiding double-counting.

**Consistency.** Monitored and reported emissions shall be comparable over time, using the same monitoring methodologies and data sets. Monitoring methodologies can be changed in accordance with the provisions of these Guidelines if the accuracy of the reported data is improved. Changes in monitoring methodologies shall be subject to approval from the competent authority and shall be fully documented in accordance with these guidelines.

**Transparency.** Monitoring data, including assumptions, references, activity data, emission factors, oxidation factors and conversion factors shall be obtained, recorded, compiled, analysed and documented in a manner that enables the reproduction of the determination of emissions by the verifier and the competent authority.

**Trueness.** It shall be ensured that the emission determination is systematically neither over nor under true emissions. Sources of uncertainties shall be identified and reduced as far as practicable. Due diligence shall be exercised to ensure that the calculation and measurement of emissions exhibit highest achievable accuracy. The operator shall enable reasonable assurance of the integrity of reported emissions to be determined. Emissions shall be determined using the appropriate monitoring methodologies set out in these Guidelines. All metering or other testing equipment used to report monitoring data shall be appropriately applied, maintained and calibrated, and checked. Spreadsheets and other tools used to store and manipulate monitoring data shall be free from error. Reported emissions and related disclosures shall be free from material misstatement, avoid bias in the selection and presentation of information, and provide a credible and balanced account of an installation's emissions.

**Cost effectiveness.** In selecting a monitoring methodology, the improvements from greater accuracy shall be balanced against the additional costs. Hence, monitoring and reporting of emissions shall aim for the highest achievable accuracy, unless this is technically not feasible or will lead to unreasonably high costs. The monitoring methodology itself shall describe the instructions to the operator in a logical and simple manner, avoiding duplication of effort and taking into account the existing systems in place at the installation.

**Faithfulness.** A verified emissions report shall be capable of being depended upon by users to represent faithfully that which it either purports to represent or could reasonably be expected to represent.

**Improvement of performance in monitoring and reporting emissions.** The process of verifying the emission reports shall be an effective and reliable tool in its support of quality assurance and quality control procedures, providing information upon which an operator can act to improve its performance in monitoring and reporting emissions.

From Annex I of the Monitoring and Reporting Decision (2007/589/EC). Note that this box refers to emissions.

Based on this premise, the following approach was taken:



- Areas for guidance were determined (see Guidance Structure);
- The MRG 2007 Decision <sup>4</sup> was then examined to assess whether it is applicable and could provide the additional guidance needed and, if so, the relevant sections were noted for inclusion in a new Commission Decision (with any amendments required);
- If the MRG 2007 Decision provided little assistance, issues were extracted for further assessment (see Issues for Guidance);
- Where required, a range of options were developed for resolving each of these ‘issues for guidance’;
- They were then evaluated and a preferred technical solution was recommended.

The report is structured to reflect this approach.



## 2. Legislative requirements

### 2.1 Overview

The Commission's proposal is not a stand-alone Directive, it amends existing legislation. The legislative requirements for aviation MRV in the EU ETS are set out in the following places:

- **Directive 2003/87/EC** – The existing European Union Emissions Trading Scheme Directive (the EU ETS Directive);
- **Commission Decision 2007/589/EC** – The Monitoring and Reporting Decision (the MRG 2007 Decision);
- **Commission Proposal COM(2006)818** – The proposed changes to the EU ETS Directive to include aviation activities (the aviation proposal);
- **Commission Proposal COM(2008)16** – The proposed changes to the EU ETS Directive announced following the review of the EU ETS (the EU ETS Review proposal).
- **Position of the European Parliament adopted at second reading on 8 July 2008** with a view to the adoption of Directive 2008/.../EC of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (2006/0304(COD)) – Approval with amendments of the proposed Directive after receiving the common position by the Council.

The EU ETS Directive and the MRG 2007 Decision are existing legislation, but the aviation proposal and the EU ETS review proposal are still in the codecision process. This project therefore presents a challenge as the legislation, upon which it is based, is not yet finalised.

However, in order to progress, the report is based on the Commission's original proposals and takes into account the recent Position of the European Parliament adopted at second reading. It does not take into account any of the changes to the EU ETS Review proposal. Clearly there is the potential for changes to be introduced to the aviation proposal throughout the codecision process and these should be taken into account when reading this report. Some of the potential changes are highlighted under section 2.4.

### 2.2 Existing requirements

#### 2.2.1 The EU ETS Directive

The EU ETS Directive sets out the rules and framework for the EU ETS as a whole. It does not provide any guidance on MRV of data for allocation; this is left to Member States to decide.



## 2.2.2 The MRG 2007

The MRG 2007 Decision sets out the approach for monitoring, reporting and verifying **emissions** covered under the Directive. **It does not cover how data should be collected for the purpose of calculating allocations** – this is currently left to Member States through their National Allocation Plans. However, many of the same principles and a similar approach can be applied to MRV of tonne kilometre data for aviation.

## 2.3 Future requirements

### 2.3.1 The ETS Aviation proposal

The Commission proposal COM(2006)818 and its amendments from the codecision procedure (the ETS Aviation proposal) has been a key legal instrument outlining aviation's inclusion into the EU ETS. The areas of the proposal that are relevant to MRV of tonne-kilometre data are Articles 3b, 3c, 3d, 3e, 3f and 3g, and the amendments to Annexes I, IV and V of the Directive, which refer respectively to: the coverage of the scheme; monitoring and reporting principles; and verification criteria.

### Coverage

The latest amendments to the ETS Aviation proposal aim to ensure that all flights which arrive at or depart from EU aerodromes will be included in the Scheme from 1 January 2012. Certain flights are excluded from the scheme; one such exclusion excludes all flights performed by aircraft with a Maximum Take-Off Weight (MTOW) under 5,700kg. The Scheme will therefore cover almost all commercial flights and a significant quantity of non-commercial flights (e.g. by business jets). The following is the full list of exclusions:

- flights performed exclusively for the transport, on official mission, of a reigning Monarch and his immediate family, Heads of State, Heads of Government and Government Ministers, of a country other than a Member State, where this is substantiated by an appropriate status indicator in the flight plan;
- military flights performed by military aircraft and customs and police flights;
- flights related to search and rescue, fire-fighting flights, humanitarian flights and emergency medical service flights authorised by the appropriate competent authority;
- any flights performed exclusively under visual flight rules as defined in Annex 2 to the Chicago Convention;
- flights terminating at the aerodrome from which the aircraft has taken off and during which no intermediate landing has been made;



- training flights performed exclusively for the purpose of obtaining 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 the aircraft;
- flights performed exclusively for the purpose of scientific research or for the purpose of checking, testing or certifying aircraft or equipment whether airborne or ground-based;
- flights performed by aircraft with a certified maximum take-off mass of less than 5 700 kg;
- flights performed in the framework of public service obligations imposed in accordance with Regulation (EEC) No 2408/92 on routes within outermost regions as specified in Article 299(2) of the Treaty or on routes where the capacity offered does not exceed 30 000 seats per year; and
- flights which, but for this point, would fall within this activity, performed by a commercial air transport operator operating either
  - fewer than 243 flights per period for three consecutive four-month periods ; or
  - flights with total annual emissions lower than 10 000 tonnes per year.

Flights performed exclusively for the transport, on official mission, of a reigning Monarch and his immediate family, Heads of State, Heads of Government and Government Ministers, of an EU Member State may not be excluded under this point.

## Free allocation

Articles 3d, 3e and 3f set out the allocation process for aircraft operators. To receive allowances, operators must submit an application along with verified tonne kilometre data for a specific ‘monitoring year’ within a set timeframe. This process is detailed in section 3.

### 2.3.2 The EU ETS Review proposal

On 23 January 2008, the Commission adopted a proposal to amend the EU ETS Directive following a review. The proposal covers a range of issues, but those relevant to MRV for aviation are:

- A proposed Regulation on Monitoring and Reporting to add more legal weight to the MRG 2007;
- A proposed Regulation on Verification to provide a more solid legal basis for verification and accreditation;
- Further improvements to verification through amendments to Annex IV and V of the Directive.

None of these proposed changes necessarily affect the nature of this project. Recommendations made through this project can be integrated into future regulations if necessary.



## 2.4 Form of guidance

As set out above, the existing legislation will be applied to the aviation sector when it joins the scheme. However, currently there is no legal instrument through which to provide guidance on MRV of tonne-kilometre data. The guidance could be incorporated into the existing MRG 2007 Decision (as an Annex), however the reporting of annual emissions is for a very different purpose (for annual compliance) to the reporting of tonne-kilometre data (which is for initial allocation of allowances) and in order to avoid confusion for operators, a separate instrument would be preferable.

The recommended guidance in this report will therefore be in the form of a new separate Commission Decision, distinct from the existing MRG 2007. It will not suggest amendments to the ETS Aviation proposal, but where appropriate will highlight where such amendments may be required.

A similar structure to that of the MRG 2007 Decision will be adopted as described in section **Error! Reference source not found.**



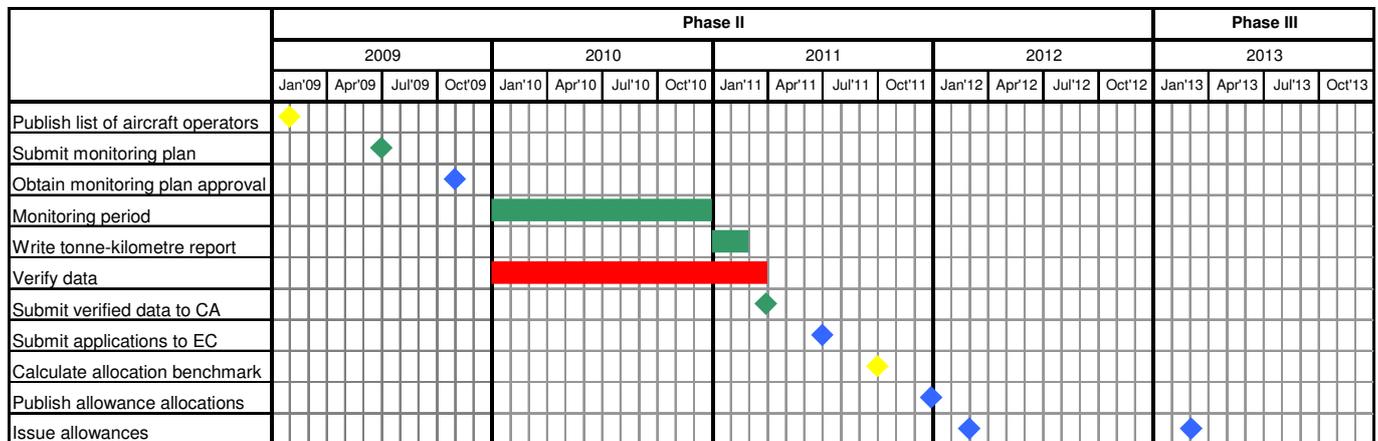
## 3. Administrative Processes

This section describes the processes that aircraft operators will have to follow in order to receive their initial allocation of allowances and the role of MRV of tonne-kilometre in this application process. It is an optional process, but without an application an operator will not receive any free allowances. Applications should be made by submitting to the competent authority in the administering Member State verified tonne-kilometre data for aviation activities performed during the monitoring year. This data must be monitored and reported in accordance with the corresponding monitoring plans, and then verified by accredited third-party verifiers.

There are a series of steps to the administrative process that makes up this application for free allowances. These steps are represented in Figure 3.1 With the exception of the first two steps related to the timing of the submission and approval of monitoring plans, all the dates of the processes in Figure 1 are set out in the proposed aviation legislation.

Submitting tonne-kilometre data as an application for an allocation of free emissions allowances is a one off process for the first two trading phases. Allocations for both Phase II (2012) and Phase III (2013 onwards) of the EU ETS will be based on 2010 aviation data.

**Figure 3.1** Timeline for monitoring, reporting and verification of tonne-kilometre data



### Key

European Commission ■ Aircraft operators ■ Competent Authority / Member States ■ Verifiers ■



## Stage 1 – Publish list of aircraft operators

Before each EU ETS phase, the Commission will publish a list of aircraft operators by 1 February specifying the administering Member State for each aircraft operator.

## Stage 2- Submit monitoring plan

Aircraft operators will be required to submit a monitoring plan for approval to the competent authority that sets out measures the operator will adopt to monitor and report tonne-kilometre data. There are no deadlines legally required for this submission. To ensure smooth operation of the system it is suggested that the monitoring plan is submitted to the competent authority at the latest six months prior to the start of the 2010 benchmarking year.

## Stage 3- Obtain monitoring plan approval

There is no deadline legally required for when the competent authority will have to approve the monitoring plan. To ensure smooth operation of the system it is suggested that the competent authority approves the monitoring plan three months prior to the start of the monitoring period. While not stated in the proposed Aviation ETS Directive, competent authorities will need to provide evidence of this approval to operators. This will comprise an important element of the verification process.

## Stage 4- Monitoring period

Aircraft operators will have to monitor tonne-kilometre data in accordance with their approved monitoring plan.

## Stage 5- Prepare tonne-kilometre report

Aircraft operators will have to report tonne-kilometre data in accordance with the required reporting format.

## Stage 6- Verify data

Accredited third-party verifiers must verify the aircraft operator's tonne-kilometre data against the approved monitoring plan.

## Stage 7- Submit verified data to the competent authority

The tonne-kilometre data report along with the verification report shall be submitted by 31st March 2011, as stated in the Aviation ETS Directive.



## Stage 8- Submit applications to the EC

Member States shall submit applications (verified tonne-kilometre data reports) to the Commission by 30th June 2011.

## Stage 9- Calculate allocation benchmark

The Commission shall calculate the allowances to be freely allocated, auctioned and set aside in the special reserve, and the benchmark used to allocate allowances by 30th September 2011.

## Stage 10- Publish allocation of allowances

Member States shall calculate and publish the allocation of allowances to each aircraft operator whose application it submitted to the Commission by 31st December 2011.

## Stage 11- Issue allowances

The competent authority of the administering Member State shall issue the allocated allowances to each aircraft operator by 28th February 2012 and 28th February for each following year.



## 4. Guidance Structure

A similar structure to the MRG 2007 Decision will be used for the new guidance on MRV of tonne-kilometre data.

- **Definitions** – Definitions of new terms;
- **Monitoring and reporting principles** – As set out above, the existing ones in the MR Decision can be applied with suitable revision;
- **Monitoring of tonne-kilometre data** – General administrative issues for monitoring data, covering issues such as boundaries (determining eligible flights and operators), timing of plan submission and content;
- **Methodologies** – Guidance on what methodologies to apply and how to apply them;
- **Uncertainty assessment** – How uncertainty should be assessed and reported;
- **Reporting** – How data should be reported, what information must be included and in what format;
- **Retention of information** – Requirements to retain information for 10 years;
- **Control and verification** – How aircraft operators should ensure that the quality of the data is controlled and guidance for verifiers on the verification process;
- **Requirements for smaller operators** – Smaller operators may suffer a disproportionately large administrative burden, so this section will consider requirements for smaller aircraft operators and any other derogations required.

This section identifies areas under each heading where guidance or analysis is needed. It also highlights where guidance can be adopted from the MRG 2007.

### 4.1 Definitions

The following terms need to be defined.

#### Basic definitions

- activities (same as the MRG 2007);
- competent authority (same as the MRG 2007);
- monitoring methodology (same as the MRG 2007);



- ‘monitoring year’ means the calendar year ending twenty four months before the start of the period to which it relates in accordance with Annexes IV and V or, in relation to the period referred to in Article 3b(1), 2010;
- ‘tonne-kilometre monitoring methodology’ means the sum of approaches used by an aircraft operator to determine the number of tonne-kilometres performed;
- ‘tonne-kilometre monitoring plan’ means a detailed, complete and transparent documentation of the monitoring methodology of a specific aircraft operator, including documentation of the data acquisition and data handling activities, and the system to control the trueness thereof;
- tier (same as the MRG 2007);
- annual (same as the MRG 2007);
- reporting period (same as the MRG 2007);
- trading period (same as the MRG 2007).

## Specific definitions

- ‘aircraft operator’ means the person who operates an aircraft at the time it performs an aviation activity listed in Annex I or, where the operator is not known or is not identified by the owner of the aircraft, the owner of the aircraft. The ICAO designator should be used to identify the operator wherever possible (proposed addition based on discussion in section 5.1);
- ‘flight’ means an activity listed in Annex I as ‘operation of an aircraft from take-off to its next landing’, as defined by ICAO. Thus take-off is the aerodrome of departure, and next landing is the aerodrome of arrival;
- ‘aerodrome of departure’ means the aerodrome from which an aircraft performing an activity listed in Annex I leaves’, whether or not this is the original aerodrome of departure for the entire flight. This is a component of an entire flight; including that falling outside the EU’s airspace.
- ‘aerodrome of arrival’ means the aerodrome at which an activity listed in Annex I arrives. This is a component of an entire flight; including that falling outside the EU’s airspace.
- ‘Mass and Balance documentation’ means the documentation specified under JAR-OPS Section 1 Subpart J;
- ‘passengers’ means the number of persons onboard excluding crew members;
- ‘payload’ means the total mass of freight, mail and passengers carried;
- ‘distance’ means the great circle distance between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95 km;



- ‘tonne-kilometre’ means a tonne of payload carried a distance of one kilometre.

► **Provide specific definitions for baseline data MRV**

## 4.2 Monitoring and Reporting Principles

The current monitoring and reporting principles described in section 3 of the MRG 2007 Decision (shown in Box 1 on page 3) can be used to derive equivalent principles for tonne-kilometre data of aviation in the new Commission Decision as follows:

- **Completeness.** Monitoring and reporting of tonne-kilometre activity data for aircraft operators shall cover all flights from aviation related activities listed in Annex I to Directive 2003/87/EC while avoiding double-counting;
- **Consistency.** Monitored and reported tonne-kilometre activity data shall be comparable for each period, using the same monitoring methodologies and data sets. Monitoring methodologies can be changed in accordance with the provisions of these Guidelines if the accuracy of the reported data is improved.<sup>5</sup> Changes in monitoring methodologies shall be subject to approval from the competent authority and shall be fully documented in accordance with these guidelines;
- **Transparency.** Monitoring data, including assumptions, references, distance data and payload data shall be obtained, recorded, compiled, analysed and documented in a manner that enables the reproduction of the determination of tonne-kilometre activity by the verifier and the competent authority;
- **Trueness.** It shall be ensured that the tonne-kilometre data determination is systematically neither over nor under true activity. Sources of uncertainties shall be identified and reduced as far as practicable. Due diligence shall be exercised to ensure that the calculation and measurement of tonne-kilometre data exhibit highest achievable accuracy. The operator shall enable reasonable assurance of the integrity of reported tonne-kilometre data to be determined. Tonne-kilometre data shall be determined using the appropriate monitoring methodologies set out in these Guidelines. All metering or other testing equipment used to report monitoring data shall be appropriately applied, maintained and calibrated, and checked. Spreadsheets and other tools used to store and manipulate monitoring data shall be free from error. Reported tonne-kilometre activity data and related disclosures shall be free from material misstatement, avoid bias in the selection and presentation of information, and provide a credible and balanced account of an aircraft operator’s activity;
- **Cost effectiveness.** In selecting a monitoring methodology, the improvements from greater accuracy shall be balanced against the additional costs. Hence, monitoring and reporting of tonne-kilometre data shall aim for the highest achievable accuracy, unless this is technically not feasible or will lead to unreasonably high costs. The monitoring methodology itself shall describe the instructions to the

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<sup>5</sup> Some language may require alteration once the new version of the MRG is made public.



aircraft operator in a logical and simple manner, avoiding duplication of effort and taking into account the existing systems used by the aircraft operator;

- **Faithfulness.** A verified tonne-kilometre data report shall be capable of being depended upon by users to represent faithfully that which it either purports to represent or could reasonably be expected to represent;
- **Improvement of performance in monitoring and reporting activity data.** The process of verifying the activity data reports shall be an effective and reliable tool in its support of quality assurance and quality control procedures, providing information upon which an aircraft operator can act to improve its performance in monitoring and reporting tonne-kilometre data.

► **Use amended version of monitoring and reporting principles for the new Commission Decision**

## 4.3 Monitoring tonne-kilometre data

Aircraft operators will need guidance on the boundaries of the scheme (i.e. which flights are included) and the requirements of the monitoring plan.

### 4.3.1 Boundaries

The coverage of flights and those that are excluded from the scheme are clearly outlined in the ETS Aviation proposal, however, there are some boundary and scope issues that need to be considered for baseline MRV:

- Aircraft operators will need to ensure that they have excluded any flights exempted by the legislation;
- It may be difficult to clearly determine the operator for each flight that is included in baseline data because there are often complex leasing arrangements between airlines.

The first issue will be addressed by the Commission through the development of guidelines<sup>6</sup> and through the verification process. As outlined in the recent Common Position, aircraft operators will use the ICAO designator, which will address the second issue. The appropriate designator will be determined by aircraft owners in cases where aircraft are not covered by the ICAO system. This is also discussed in section 5.1.

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<sup>6</sup> The proposal states that within 6 months the entry into force of the Directive, guidelines will be developed on the detailed interpretation of the aviation activities in Annex I in particular flights related to search and rescue, fire fighting flights, emergency medical flights, and flights performed by commercial air transport operators operating less than 243 flights per period for three consecutive four month periods.



## 4.3.2 Monitoring Plan

Aircraft operators have to submit a monitoring plan setting out measures to monitor and report tonne-kilometre data. However, there is no specific guidance on what should be included in a tonne kilometre monitoring plan, what format it should take or when it must be submitted for approval by the CA.

In the current scheme, where baseline (or activity) data was used to determine allocation, Member States did not use the same approach. Given the global nature of the aviation industry, a more harmonised approach should be used in order to avoid competitive distortions (e.g. if one MS has more relaxed requirements).

The new Commission Decision on tonne-kilometre data should include a section clearly stating requirements for monitoring plans. The MRG 2007 Decision sets out guidance for monitoring plans for annual emissions, much of which can be applied to tonne-kilometre monitoring plans. This approach will help ensure a more consistent approach to monitoring plans for tonne-kilometre data and avoids confusion between different monitoring plans.

However, one key issue relates to the timing of submission of tonne-kilometre monitoring plans and this is considered below.

- ▶ **Include details of tonne-kilometre monitoring plan requirements based on the existing requirements for emissions monitoring plan requirements**
- ▶ *Further guidance needed for timing of submission of monitoring plans. This is discussed in section 5.2.*

## 4.4 Methodologies

The calculation methodology is set out in the aviation proposal as follows:

<b>Box 2</b>	<b>Calculation methodology for tonne-kilometre data</b>
	$\text{tonne kilometres} = \text{distance} \times \text{payload}$ <p>where:</p> <p>“distance” means the great circle distance between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95 km; and</p> <p>“payload” means the total mass of freight, mail and passengers carried.</p>

Whilst this sets out the broad approach, further guidance is needed in several areas as outlined below.



## Calculation formulae

The proposal requires the above calculation formula to be applied. This can be re-iterated in a section on 'calculation formula'. However, the formula does not specify units to use, so there needs to be further clarification of units. Namely that distance should be in kilometres and payload should be expressed in metric tonnes.

- ▶ **Calculation formula and units should be specified**

## Tiers of approaches

The MRG 2007 Decision allows the use of different tiers of approaches for each of the factors used when reporting annual emissions. These tiers range from lower accuracy and higher uncertainty measurement methods (tier 1) to more accurate and less uncertain methods (tiers 3 and 4). Operators are classified according to their annual emissions and larger operators must adopt a more robust (i.e. higher tier) methodology.

Tiering allows operators some flexibility to take into account the technical practicality or cost of an approach without compromising accuracy or certainty. It is a way to ensure those emitting high quantities of CO<sub>2</sub> monitor emissions with the highest level of accuracy that is technically possible within reasonable costs, where errors or poor reporting could significantly bias the total. It also aims to reduce the monitoring burden on smaller operators, where lower quality reporting has a lower absolute effect.

Discussions with Eurocontrol could reveal that a tiering approach, as applied to emissions categories, may not be necessary for tonne-kilometre data. If Eurocontrol data quality is consistent across operators covered, then the applicable uncertainty range is also open to discussion.

Furthermore, given the nature of the data monitored to determine aviation performance, the issue of tiering can also be disregarded if the possibility of using certain industry defaults can be considered.

- ▶ **Where industry defaults, standards and Eurocontrol data is used, no tiers will be required.**
- ▶ **Further assessment may be required on the use of tiers for issues such as for the calculation of freight and mail mass.**



## Distance

Distance is defined as the great circle distance (GCD) between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95km<sup>7</sup>. Further guidance is needed on how to calculate the GCD.

- What data sources to use for aerodrome locations;
- Which method to use for calculating GCD (the Earth is not a perfect sphere and there are more precise ways to calculate GCD).

► ***Clearer guidance needed on the calculation of distance. This is discussed in section 5.4.***

## Payload

The proposal specifies that for calculating payload

- The number of passengers excludes crew members;
- Aircraft operators can choose to apply the actual mass, standard mass or a default value of 100kg (under negotiation) for each passenger and their checked baggage.

There needs to be clearer guidance about this and the calculation of payload needs to be more explicitly defined.

► ***Clearer guidance needed on the calculation of payload. This is discussed in section 5.5.***

## 4.5 Uncertainty assessment

The need for uncertainty assessment as part of the tonne kilometre may not be relevant. Given that uncertainty ranges as applied to the measurement of emissions data relates largely to the associated uncertainty of emissions meters, it is not clear that this approach will be relevant to the measurement of the data in question. Parameters like distance for example, do not require uncertainty assessment; it is possible that it could be based on a standard default for the industry. Weight is perhaps the only parameter that could require uncertainty assessment given the uncertainty associated with weighbridges for example.

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<sup>7</sup> Added by the Council to factor in air traffic control and routing issues



## 4.6 Reporting

Each aircraft operator shall include the following information in its application for free allowances:

### A. Data identifying the operator, including:

- Name of the operator;
- Its administering Member State;
- Its address, including postcode and country and, where different, its contact address in the administering Member State;
- The aircraft registration numbers and types of aircraft used during the year covered by the application to perform the aviation activities listed in Annex I for which it is the aircraft operator;
- The number and issuing authority of the air operator certificate and operating license under which the aviation activities listed in Annex I for which it is the aircraft operator were performed;
- Address, telephone, fax and email details for a contact person; and
- Name of the aircraft owner.

### B. Tonne-kilometre data:

- Number of flights by aerodrome pair;
- Number of passenger-kilometres by aerodrome pair;
- Number of tonne-kilometres by aerodrome pair;
- Chosen method for calculation of mass for passengers and checked baggage; and
- Total number of tonne-kilometres for all flights performed during the year to which the report relates falling within the aviation activities listed in Annex I for which it is the aircraft operator.

Discussions in section 5.1 propose the identification of operators using ICAO designators. If this is adopted then Section A reporting should also include the ICAO Designator of the aircraft operator to allow easy identification of the operator. This list is otherwise clear and should be reiterated in the guidance.

- ▶ **Reiterate required content for tonne-kilometre data reporting, including ICAO Designator (see section 6.3 for further discussion).**



## 4.7 Retention of information

In the current scheme, operators are required to retain records of their annual emissions for a minimum of ten years in order to allow reproducibility of the determination of emissions by a third party. This approach can also be applied to tonne-kilometre data – tonne-kilometre reports should be retained for ten years. However, if the baseline year relates to subsequent phases of the EU ETS which exceeds a total of ten years, arguably the data retention period for tonne kilometre data could be longer.

- ▶ **Require tonne-kilometre reports to be retained for ten years. Input from the public consultation process to be considered.**

## 4.8 Control and verification

In order to ensure the trueness and faithfulness of reported tonne-kilometre data, adequate internal control and external verification processes are necessary.

The aviation proposal does not include any specific requirements for data control and management by aircraft operators. However, well-established processes for annual emissions are set out in the existing MRG 2007 Decision (Section 10). In line with the aviation proposal<sup>8</sup> and in order to avoid duplication of effort, the current MRG 2007 Decision is used as the basis for control and verification of tonne kilometre data. The question is whether it should be used in whole or in part, and whether any changes are required to ensure that it is applicable to baseline data monitoring and reporting.

To determine whether additional or different guidance is required for the verification process it is first necessary to consider how the existing requirements in the EU ETS Directive and the MRG 2007 Decision would apply to verification of tonne kilometre data.

Control and verification procedures for the EU ETS aim to ensure that the data reported by operators are accurate and free from errors. The current provisions that must be followed by operators and verifiers are outlined in section 10 of the MRG 2007.

‘Control’ refers to the operator’s systems and procedures used to ensure annual emissions data are:

- collected in accordance with the approved plan;

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<sup>8</sup> The aviation proposal amends Annex V to apply the general principles, and methodology for verifying emissions reports to the verification of aviation tonne-kilometre data.



- handled and stored appropriately;
- free from misstatements (omissions, misrepresentations and errors);
- readily available for review by a verifier;
- retained for the required period of time.

‘Verification’ by an independent, accredited verifier then includes checks of these procedures to ensure that data have been monitored in accordance with the approved Monitoring Plan, the legislation and any guidelines, and that they are free from material misstatements. The verifier’s findings are issued as an External Verification Report.

Together these play a major role in ensuring the integrity of the data on which the allocations will be based.

## Data Acquisition and Handling (10.1) and Control System (10.2)

Section 10.1 and 10.2 require operators to implement effective data acquisition, handling and control systems, including internal risk assessment, procedures and responsibilities, corrective action systems, records and documentation, maintenance and calibration systems and internal reviews and validations of data to mitigate the identified risks before the start of the reporting period. This is to ensure that reported emissions are calculated correctly and that all data and information is documented and retained to facilitate verification.

## Control Activities (10.3)

Section 10.3 requires operators to control and mitigate inherent risks in control systems and to identify and implement control activities relating to; procedures and responsibilities (10.3.1) quality assurance (10.3.2), reviews and validation of data (10.3.3), any outsourced processes (10.3.4), corrections and corrective action (10.3.5) and records and documentation (10.3.6).

Section 10.3.2 requires operators to calibrate, adjust and check measuring equipment at regular intervals prior to use, applying relevant traceable standards where available. If components of a measurement instrument cannot be calibrated, operators can propose alternative control activities, subject to CA approval.

In the case of aviation, this requires any measuring equipment (e.g. for weighing payloads etc) to be calibrated at regular intervals and checked against international measuring standards, and records of this retained. In the context of tonne-kilometre data this will apply to the fuel uplift and weighing of payload where applicable.

Section 10.3.3 refers to reviews and validation of data.

To implement these provisions, some operators will need to upgrade their current procedures and systems. Although this will be an initial cost, good data management is needed to ensure robust and fair allocations, and will speed up the verification process.



Specific procedures for calibration and checking against international standards will need to be determined by the operator (most likely in line with current procedures) and noted in the monitoring plan. Verifiers will then need to review records to confirm the procedures have been applied as part of the verification process. If stakeholders consider that additional clarity is required on such procedures, further guidance may be developed through the consultation process.

- ▶ **If sought by stakeholders, provide further guidance on calibration and quality assurance checks of tonne-kilometre data and any relevant traceable standards**

## Verification (10.4)

### 10.4.1 General principles

The objective of the verification is to ensure that baseline data have been monitored in accordance with the guidelines and that reliable and correct baseline data are reported. A verifier is *‘a competent, independent, accredited verification body or person with responsibility for performing and reporting on the verification process, in accordance with the detailed requirements established by the Member State pursuant to Annex V of the Directive 2003/87/EC’*.

Verifiers must state, with reasonable assurance, whether the data in the baseline data report is free from material misstatements and whether there are no material non-conformities. To do this they must, among other things, check the records, sample raw data and examine calculations and spreadsheets.

### Verification methodology (10.4.2)

Section 10.4.2 describes how the verifier must plan and perform the verification with the following steps:

- Strategic analysis;
- Risk analysis;
- Verification;
- Internal verification report;
- Verification report.

These steps can be applied to verification of aviation tonne-kilometre data.

Verification will also check if weighing equipment meets any specific uncertainty requirements and specifications for calibrations etc. Actual payload may be the most problematic if this is dependant on numerous weighing instruments in all aerodromes.



Verifiers must also apply the appropriate materiality levels when performing verifications, with existing requirements depending on the scale of emissions. For installations emitting between 0 and 500 kt CO<sub>2</sub> per year, the emission data must meet a materiality level of 5% and for those emitting over 500 kt CO<sub>2</sub> the data must meet a materiality level of 2%. The materiality level requirement is taken into account in determining the level of detail and amount of data/information checking performed by the verifier. It therefore also has a bearing on the time and potential costs of verification.

Materiality thresholds based on emissions are not suitable for tonne-kilometre data, therefore materiality level values need to be set to ensure verifiers are able to give 'reasonable assurance' about the quality of the tonne kilometre data, within reasonable costs. It seems appropriate to treat all operators in a similar way since the data are used in the allocation process and therefore to set the materiality level at 2% provided this does not incur unreasonable costs. This will be further discussed during consultation.

- ▶ **The control and verification methodology outlined in Section 10 of the MRG 2007 Decision should be replicated in guidance on tonne kilometre data.**

## 4.9 Accreditation of verifiers

Accreditation is the processes through which verifiers and/or verification bodies prove that they have the experience, capabilities and internal procedures necessary to perform independent verifications in accordance with the requirements of the MRG 2007 Decision and the ETS Directive. Once they show that they can perform verifications to an adequate standard they are formally 'accredited'.

### 4.9.1 Within Europe

Most MSs have accreditation bodies (often members of the European Co-operation on Accreditation) that assess and accredit verifiers in accordance with international standards (e.g. ISO 14065) and undertake regular surveillance of verifiers' work. Typically, lists of accredited verification bodies or verifiers who can be contacted by the operators to perform verifications are available from the accreditation bodies or MS.

The current proposal does not make specific reference to accreditation requirements for verifiers contracted by aircraft operators to verify tonne kilometre data.

Since the verification process proposed for aviation is the same as for existing installations (i.e. essentially the process of checking data for errors and against the monitoring plan), verifiers are unlikely to need a new set of skills and therefore their existing accreditation should, in most instances, be adequate to enable them to perform verifications of tonne kilometre data. No further guidance on accreditation requirements is therefore considered necessary, although this is open to stakeholder views.



## 4.9.2 Outside Europe

Under the proposal, third country aircraft operators will also need to use accredited verifiers. It may be most appropriate for them to use a verifier that has been accredited by the accreditation body in their administering MS. However, they can also use verifiers from other countries (such as their country of origin) provided the verifier has been accredited in an equivalent manner (i.e. meets the requirements in the MRG 2007) and is recognised by the administering MS's competent authority to whom the tonne kilometre data is submitted.

- ▶ **Accreditation requirements in the MRG 2007 Decision should be applied to all verifiers intending to perform verifications of tonne-kilometre data**

## 4.10 Requirements for smaller operators

There are currently no specific provisions to reduce the monitoring burden for smaller operators. However, in accordance with the principles of MRG 2007 Decision – to ensure cost effectiveness in approaches – options to reduce potential costs for smaller operators that are likely to receive lower allocations should be examined. These could be developed through some form of tiering or may involve specific exclusions from the requirements for certain smaller operators. This will be considered throughout each section and will not be addressed as its own issue.

As discussed in section 4.4, it is possible that as a result of reviewing Eurocontrol data, and given the number of operators that are excluded (or that are considering exclusion) from the EU ETS, it will not be necessary to create a separate category for small emitters in the aviation sector.

- ▶ **Explore options for reducing costs for smaller operators.**

## 4.11 Special reserve applications

Provision has been made to set aside a reserve of allowances for new aircraft operators entering the scheme and those experiencing rapid growth. Three per cent of allowances to be allocated will be reserved for them.

This provision is for operators that begin operating after the tonne-kilometre data is provided (new operators), as well as for those operators whose tonne kilometre data increases by an average of more than 18 per cent per annum between the year of tonne-kilometre data submission and the second calendar year of the EU ETS trading phase (high-growth operators). And whose activity in both these cases is **not in whole or in part a continuation of an aviation activity previously performed by another aircraft operator.**



In order to apply for this reserve, eligible operators must submit an application to their competent authority by 30<sup>th</sup> June in the third year of the period, including:

- Verified tonne-kilometre data for the second year of the period;
- Evidence for their eligibility.

High growth operators will also have to provide the competent authority with:

- the percentage increase *and* the absolute increase in tonne-kilometres performed between the original monitoring year (that was used for their initial regular application) and the second calendar year of the period;
- the absolute growth in tonne-kilometres performed between the original monitoring year (that was used for their initial regular application) and the second calendar year of the period which exceeds the 18 per cent increase.

However, there is little additional guidance on how operators will be able to demonstrate that their additional or new activity is ‘not part of a continuation of an aviation activity previously performed by another aircraft operator’.

- ▶ **Provide further guidance on how to demonstrate that applications to the special reserve concern additional or new activity.**



## 5. Issues for guidance

### 5.1 Guidance on aircraft operator

#### Issue

The proposal defines aircraft operators as ‘*the person who operates an aircraft at the time it performs an aviation activity listed in Annex I or, where the operator is not known or is not identified by the owner of the aircraft, the owner of the aircraft*’. However, the aviation sector is highly fluid and for commercial airlines, there is a range of commercial arrangements. This may make it difficult to clearly identify which operator is responsible for each flight because of complex arrangements between airlines such as wet and dry leasing and code sharing (see Box 3). The definition is still open to interpretation<sup>9</sup> and therefore requires further clarification.

#### Box 3 Typical commercial arrangements in aviation

**Code share** – Where a flight operated by an airline is jointly marketed as a flight for one or more other airlines. The airline that operates the flight (e.g. provides the aircraft, crew and ground handling services) is referred to as the operating carrier. The companies that sell tickets for that flight but do not actually operate it are referred to as marketing carriers.

**Dry lease** – A lease of an aircraft where the aircraft is operated under the Air Operator Certificate of the lessee. It is normally a lease of an aircraft without crew, operated under the commercial control of the lessee and using the lessee's airline designator code and traffic rights.

**Wet lease** – A lease of an aircraft where the aircraft is operated under the Air Operator Certificate of the lessor. It is normally a lease of an aircraft with crew, operated under the commercial control of the lessee and using the lessee's airline designator code and traffic rights.

Definitions of leasing arrangements taken from UKCAA Official Record Series 4. No 570 (30 Sept 2005), p2.

#### Options

There are several options for identifying the operator of a commercial flight:

- Option 1 – No further guidance;
- Option 2 – Based on ICAO airline designator code;
- Option 3 – Based on Air Operator's Certificate (AOC).

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<sup>9</sup> Note that as the definition currently stands, it could be implied that the pilot is the aircraft operator. Clearly this is not the intention and is likely to be remedied through the codecision process.



## Analysis

Option 1 would leave the definition open to interpretation and could cause disagreements over responsibility (although the definition in the proposal specifies that if the operator cannot be identified, then the aircraft owner should be responsible).

Using the ICAO designator would provide a unique identity for each commercial airline. Leased flights are carried out under the lessee's designator, which would be appropriate as they are responsible for the flight.

Using the AOC would create complications for leasing arrangements. Some leased flights (see box above) are carried out under the lessee's AOC, but others may be under the lessor's AOC.

## Recommendation

The ICAO designator should be used to identify the operator wherever possible. The aircraft owner will need to determine the designator accordingly in cases where an aircraft is not covered by the ICAO system. This corresponds to the European Parliament's second reading on 8<sup>th</sup> July 2008.

- ▶ **Provide further guidance for operators on the use of designators in cases where they are not covered by the ICAO system.**

## 5.2 Timing of submission of Monitoring Plan

### Issue

The proposal (as amended by the Council) requires aircraft operators to submit a monitoring plan setting out how they will monitor and report tonne-kilometre data. However, there is no guidance on the process for doing so.

In the current scheme, where baseline (or activity) data was used to determine allocation, Member States did not use the same approach – they developed their own processes for baseline data reporting. Furthermore, not all Member States required these data to be verified.

### Options

Options are:

- Option 1 – provide no additional guidance on when a tonne-kilometre monitoring plan must be submitted and allow MS to develop their own rules;
- Option 2 – require monitoring plans to be approved before the start of the monitoring year;



- Option 3 – require monitoring plans to be approved before the end of the monitoring year.

## Analysis

Option 1 would allow for inconsistency with different approaches in different Member States. This may cause confusion amongst aircraft operators or worse, create competitive disadvantages. However, such an approach would allow maximum flexibility for Member States to adapt to their particular circumstance and capacity.

Options 2 and 3 would ensure a more consistent approach and provide clear guidelines. Verifiers need a monitoring plan in order to verify against, therefore it makes little sense in providing a monitoring plan after some or all of the monitoring has taken place. If there are any errors or the plan is not approved, then there is little that can be done as the data has already been collected. This provides no incentive for creating a high quality monitoring plan. As such, Option 3 is of limited value.

Option 2 appears much more promising, providing consistency and a robust process to allow proper verification. Member States should be allowed some freedom to set their own timetable (in order to reflect their circumstance), but monitoring plans should be approved before the monitoring begins.

## Recommendation

There are no deadlines legally required for this submission. However, in order to ensure smooth operation of the system, to allow verifiers to perform their role properly and to assure the quality of the process, it is suggested that monitoring plans should be submitted to the competent authority at the latest six months before the **start** of the monitoring period. This requirement should be applied uniformly across all member states to avoid negative distributional impacts. At the very least, it should be specified that monitoring plans must be approved before the start of the monitoring period.

## 5.3 Contents of Monitoring Plan

### Issue

There is no specific guidance on what should be included in a monitoring plan for tonne kilometre data monitoring. In addition, current guidelines and legislation do not suggest what form the monitoring plan should take, for example if a template will be made available in order to harmonise the content and structure of plans.

### Options

The options are:

- Option 1 – provide no additional guidance on what operators must include in a tonne kilometre data reporting plan;



- Option 2 – specify requirements for the tonne kilometre data monitoring plan stating what information must be included in a monitoring plan;
- Option 3 – in addition to option 2, provide a standard template/format for operators to complete.

## Analysis

Option 1 is not appropriate since it will lead to inconsistent reporting requirements by each MS competent authority.

Section 4.3 of the MR Decision can be used as a basis for developing the requirements of monitoring plans for tonne kilometre data. However, while some requirements are suitable, others are not and some could pertain to aircraft following suitable amendments. Therefore, a list of requirements for reporting plans should be given in the new Commission Decision. This will ensure a reasonable level of harmonisation among competent authorities.

Option 3 provides for the additional possibility of a standard template/format for tonne kilometre reporting plans. This would provide even greater harmonisation and therefore is the preferred option. Example templates have been produced for the Public Consultation and will be found as separate files (i.e. these are Excel templates and are not provided as Appendices to this document). Note that these indicate the potential type of structure and contents, but not necessarily the format of the templates.

On the basis of option 3, the new Commission Decision could also contain text such as the following:

*“Monitoring plans for tonne kilometre data shall contain:*

- i. the description of the aircraft operator, aircraft operated and routes operated;*
- ii. information on responsibilities for monitoring and reporting within the control of the aircraft operator;*
- iii. a description of the calculation-based methodology used;*
- iv. a description of the methodology applied to distance calculations;*
- v. a list and description of the methodology applied to payload calculations including a description of any measurement systems;*
- vi. a description of the procedures for data acquisition, handling activities and control activities (such as calibration of weighing equipment) as well as a description of the activities to be performed during the monitoring year.*

*The monitoring methodology shall be changed if this improves the accuracy of the reported data, unless this is technically not feasible or would lead to unreasonably high costs.*



*All changes and proposed changes in monitoring methodology or the underlying data sets shall be notified to the competent authority without undue delay after the aircraft operator has become aware of it or could in all reasonableness have become aware of it, unless otherwise specified in the monitoring plan.*

*Changes to the monitoring plan shall be clearly stated, justified and fully documented in internal records of the operator.*

*A competent authority shall require the aircraft operator to change its monitoring plan if its monitoring plan is no longer in conformity with the rules laid down in these Guidelines.”*

- ▶ **An example template of a monitoring plan is provided in a separate file for use in the public consultation.**

## 5.4 Guidance for ‘distance’

### Issue

Distance is defined in the aviation proposal as ‘*the great circle distance (GCD) between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95 km*’.

No Guidance is currently provided on whether existing databases of great circle distances can be used or whether each operator is expected to calculate the GCD. Eurocontrol has a model that lists ICAO airports and can be reliably used to get the standard GCD distances between all airports. It is not known at this stage what other datasets already exist with GCD between aerodrome pairs.

The Great Circle Distance is technically defined as the shortest distance between any two points on the surface of a sphere measured along a path on the surface of the sphere. The Earth can be approximated by a sphere with a radius of 6372.795 km. However, the Earth is not a perfect sphere, and is more closely approximated by a spheroid with the radius of curvature of 6356.750 km at the poles and 6378.135 km at the equator<sup>10</sup>.

There is no clear guidance in the legislation about how to calculate the Great Circle Distance. Furthermore, the location used for each aerodrome can vary and there is no guidance on which data sources to use to establish aerodrome locations. Guidance is therefore needed on two issues. First, to establish whether the existing dataset(s) should be utilised for obtaining GCDs. And second, in those cases where the existing dataset(s) do not have an entry for a particular aerodrome pair, what method to adopt to calculate GCDs.

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<sup>10</sup> Bomford, Guy 1980 *Geodesy* Clarendon Press, Oxford



## Options

There are three options for estimating GCDs:

- Option 1 – Specify that operators should use the GCDs between airports with ICAO codes held by Eurocontrol's WHS84 model;
- Option 2 – Specify criteria for ensuring reliable and robust GCD datasets, but let operators choose their own;
- Option 3 – Provide no guidance and specify neither a particular dataset, nor criteria for ensuring the robustness of GCD data from existing datasets.

## Analysis

Option 1 would stipulate that operators should utilise data from the Eurocontrol WHS84 model, ensuring consistent, reliable and robust data. This model contains GCDs between all airports with ICAO codes. Eurocontrol can provide GCD data for all intra-EU airport pairs and for all airport pairs involving extra-EU countries for which a flight has taken place in the past. The only exception where GCD data would not exist in Eurocontrol would be for airports outside Europe from which no flights to Europe have ever departed or no flights from Europe have ever arrived. Even in these cases, on the date of the first flight, a GCD would be generated and made available by Eurocontrol. This option – having only one data source for the vast majority of flights, if not all – would harmonise the methodology used by operators and would ensure a fair allocation, given that some variation in airport location data may exist due to the size of airports.

Option 2 would ensure that the GCD data that is used is reliable and robust, whilst not restricting the sourcing of GCD data. There are two main options to calculate GCD:

- Calculate GCD by approximating the Earth as a sphere with average radius 6372.795 km; gives an error of approximately 0.5% (32km) for a long-haul flight from London Gatwick to Newark (6,404km).
- Calculate GCD by approximating the Earth as a spheroid with polar radius of 6356.750 km and equatorial radius of 6378.135 km. This is the more accurate method to use, but requires more complex calculation.

However, because the opportunity would exist for different data sources to be used for the same aerodrome pair, there is some potential that two operators may use slightly different GCDs to calculate tonne-kilometre data. It is not known at this stage what other GCD datasets exist.

Option 3 is the least restrictive approach. However it would not ensure the use of consistent GCD data, nor would it specify that the source used is reliable and robust.



## Recommendation

There needs to be a degree of consistency and an assurance that the data used are robust, so it would not be appropriate to allow aircraft operators to select their location values without any guidance. It is therefore recommended that Option 1 is chosen such that operators should use Eurocontrol data where available for their aerodrome pairs. Where Eurocontrol data is not available, an alternative method should be provided by the aircraft operator offering robust and reliable datasets providing at least the same accuracy as the sphere method described in Option 2.

- ▶ **Consultation with Eurocontrol will be required to determine how this data will be accessed.**
- ▶ **Require aircraft operators to clearly state their data source for GCDs.**

### 5.4.1 Calculating GCDs

Where existing GCD datasets do not, for whatever reason, hold the GCD between a particular aerodrome pair, then the operator will have to calculate the GCD.

## Options

For calculating the GCD, there are three options:

- Option 1 – Do not specify a method and allow operators to choose a method;
- Option 2 – Calculate GCD by approximating the Earth as a sphere with radius 6372.795 km;
- Option 3 – Calculate GCD by approximating the Earth as a spheroid with polar radius of 6356.750 km and equatorial radius of 6378.135 km.

## Analysis

Option 1 would be simplest, but would not encourage more accurate reporting of data by aircraft operators and could result in an inconsistent approach.

Using Option 2 (Earth as a sphere) gives an error of approximately 0.5% (32km) for a long-haul flight from London Gatwick to Newark (6404 km).

Option 3 is the more accurate method to use, but requires more complex calculation. Given that the scheme covers approximately 6290m flight km (in 2004, based on Eurocontrol data), a 0.5% error introduced by a less accurate method would have an increased significance.



## Recommendation

Option 3 is technically the most accurate method and should be used where possible. For some operators this may require more effort for marginal improvement and may not be warranted. In light of this, the preferred method should be based on a spheroidal Earth (Option 3), with the minimum requirement to assume a spherical Earth (Option 2).

- ▶ **Preferred method is to require GCD calculations to assume a spheroidal Earth**
- ▶ **The minimum requirement should be for GCD calculations to assume a spherical Earth**

## 5.5 Guidance for ‘payload’

### Issue

Payload comprises three sets of data: mass of freight, mass of mail, and mass of passengers. The Aviation ETS legislation provides some requirements for calculating the mass of passengers:

- the number of passengers excludes crew members; and
- aircraft operators may choose one of the following two options to report passenger and checked baggage data:
  - to apply either the actual or standard mass for passengers and checked baggage contained in its mass and balance documentation for the relevant flights; or
  - to apply a default value of 100 kg for each passenger and his checked baggage.

However, there is no further guidance on how to calculate and report freight data and mail data. Overall, there needs to be clearer guidance on how to report payload, including the different approaches that are permitted for each factor.

Verification is also a challenge when weight or mass measurements are involved because it requires individual assessments of measurement instruments. Calculating the uncertainty for a monitoring system which uses hundreds of weighing instruments for baggage would be extremely difficult and time consuming. However, commercial aircraft operators record mass and balance data as part of their JAR-OPS requirements, which may provide an alternative means for verification or a source of data itself.

### Options

- Option 1 – Do not impose specific uncertainty requirements for freight and mail mass measurements;



- Option 2 – Use as a default data from the mass and balance documentation (where available) for freight and mail mass
- Option 3 – Provide tiers<sup>11</sup> of approaches for freight and mail mass measurements. These would have decreasing levels of uncertainty, in-line with methodology for setting tiers for monitoring and reporting activity data in the MRG 2007 Decision;

### Analysis

Option 1 would leave considerable discretion to operators and competent authorities that could affect the scheme's implementation and would introduce inconsistencies between operators. This option would be acceptable if evidence could be provided that common practice in the aviation industry led to results precise enough, so that the annual measurement uncertainty would be reached in any event, and that no additional legal requirement would need to be introduced.

Option 2 is considered as the most appropriate approach for commercial operators, which already collect data on payload as part of their JAR-OPS / EU OPS<sup>12</sup> safety requirements for mass and balance<sup>13</sup>. This information must be recorded in flight documentation, which must be kept for 3 months.

The EU OPS set in their Subpart J “Mass and Balance” that “*an operator must establish the mass of the traffic load, including any ballast, by actual weighing or determine the mass of the traffic load in accordance with standard passenger and baggage masses as specified by OPS 1.620*”. Traffic load is defined as “*the total mass of passengers, baggage and cargo, including any non-revenue load*”. Appendix 1 to OPS 1.620 sets the procedure for establishing revised standard mass values for passengers and baggage. This procedure ascertains that “*the weighing machine to be used for passenger weighing (...) must be accurate to within 0,5% or 200 g whichever is the greater*”. However, no specific accuracy is required for weighing freight and mail. According to JAR-OPS/EU OPS, the method for determining the applicable passenger, baggage and cargo mass must be provided by each operator in their Operations Manual.

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<sup>11</sup> Tiers of approaches are introduced by the existing MRG (Commission Decision 2007/589/CE) to determine the following variables: activity data (fuel/material flow and Net Calorific Value), emission factors, composition data, oxidation and conversion factors. The tier system balances the need for flexibility to accommodate different sectors and technologies with the need for a level playing field for operators across the EU. Higher tiered approaches involve higher accuracy in measurement or calculation.

<sup>12</sup> JAR-OPS refers to the Joint Aviation Requirement for the operation of commercial air transport (aeroplanes), published by the Joint Aviation Authorities. EU OPS refers to Commission Regulation (EC) No 8/2008 of 11 December 2007 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane.

<sup>13</sup> See JAR-OPS Section 1, Subpart J for details of Mass and Balance requirements for commercial aircraft operators.



Mass of passengers and baggage are important factors in ensuring safe operation of the aircraft and therefore accurate information is needed by the pilot. There will naturally be some uncertainty that would be challenging to calculate, however if option 2 was applied, verifiers would simply need to check that the reported data was consistent with mass and balance documentation. This option represents a balance of uncertainty/accuracy with cost, in line with the MRV principles.

However, non-commercial operators are not covered by JAR-OPS and they will not have the same documentation. As they are generally smaller operators (according to EBAA, 40% of business aviation operators have only one aircraft and 85% have fewer than five), they will have less instrumentation. Therefore, estimating the uncertainty of the monitoring system would be more straightforward but reaching a certain uncertainty threshold would be more difficult.

Providing tiers of approaches (option 3) would be only necessary to estimate uncertainties of weighing instruments when no mass and balance documentation can be provided. This is likely to happen only in smaller operators and therefore it would not be possible to define different tiers according to different sizes or emissions thresholds of operators, as it is the case in the existing Monitoring and Reporting Guidelines for stationary installations. Accordingly, the preferred approach for operators that cannot provide mass and balance documentation would be to require a specific uncertainty threshold to all operators, based in existing uncertainty standards of the industry weighing instruments. An uncertainty assessment could be required for these operators in order to prove compliance with the thresholds defined.

## Recommendation

Option 2 should be considered as the default option for commercial airlines. For operators without mass and balance documentation requirements, a specific level of uncertainty will be required according to industry standards, which may need to be proved through an uncertainty assessment.

- ▶ **Specify that aircraft operators must report their payload data under 2 headings: Freight and Mail; and Passengers and Checked Baggage.**
- ▶ **Clarify that operators may choose their method for reporting Passenger and Checked Baggage data.**
- ▶ **Specify that operators must use the same payload values as recorded in their Mass and Balance documentation where available.**
- ▶ **Where Mass and Balance documentation is not available, provide additional guidance for reporting the mass of Freight and Mail.**



## 5.6 Eligibility for Special Reserve

### Issue

A Special Reserve has been proposed by the Council as a set of allowances for operators that begin operating after the initial tonne-kilometre data is provided (new operators), as well as for those operators whose tonne kilometre data increases by an average of more than 18 per cent per annum between the year of tonne-kilometre data submission and the second calendar year of the period (high-growth operators). And whose activity in both these cases is **not in whole or in part a continuation of an aviation activity previously performed by another aircraft operator**.

New Article 3d(a)(9) sets out that detailed rules on the operation of the special reserve may be established under the comitology process. Note that this project only considers the MRV aspects of the special reserve and its scope does not currently include broader issue relating to its operation. An issue relevant to MRV and this report is: an application to the proposed special reserve requires aircraft operators to submit verified tonne-kilometre data to the CA, but there are no details of this process. In order to ensure consistency and equity, the same rules as for standard applications should be followed.

### Options

- Option 1 – Provide no further guidance other than requiring aircraft operators to prove their eligibility to competent authorities;
- Option 2 – Set out an EU-wide definition of eligibility;
- Option 3 – Set out a list of sample ineligible activities.

### Analysis

Option 1 would provide greatest degree of flexibility and allow competent authorities to exercise their judgement as to the nature of activities. However, this may result in different treatment in Member States and could create inequalities across the EU.

Setting out an EU-wide definition of eligibility would be the clearest solution, providing harmonised guidance that would be applied to all operators regardless of their administering Member State. However, it still remains difficult to define and risks excluding legitimate activities or including inappropriate activities.

Option 3 is a compromise between the two, clearly defining specific examples that are not eligible, but again a single, comprehensive list is challenging to develop.



## Recommendation

It is clear that some form of EU-wide harmonisation is required to ensure a level playing field.

- ▶ **Clarify that the applications to the special reserve should be in line with the provisions of this guidance.**
- ▶ **Determining eligibility with the special reserve should coincide with the requirements outlined in the proposed monitoring plan.**



## 6. Summary of guidance

This section summarises the guidance to be included in the new Commission Decision.

### 6.1 Definitions

#### ► Provide the following definitions

#### Basic Definitions

- activities (same as the MRG 2007);
- competent authority (same as the MRG 2007);
- monitoring methodology (same as the MRG 2007);
- ‘monitoring year’ means the calendar year ending twenty four months before the start of the period to which it relates in accordance with Annexes IV and V or, in relation to the period referred to in Article 3b(1), 2010;
- ‘tonne-kilometre monitoring methodology’ means the sum of approaches used by an aircraft operator to determine the number of tonne-kilometres performed;
- ‘tonne-kilometre monitoring plan’ means a detailed, complete and transparent documentation of the monitoring methodology of a specific aircraft operator, including documentation of the data acquisition and data handling activities, and the system to control the trueness thereof;
- tier (same as the MRG 2007);
- annual (same as the MRG 2007);
- reporting period (same as the MRG 2007);
- trading period (same as the MRG 2007).

#### Specific definitions

- ‘aircraft operator’ means the person who operates an aircraft at the time it performs an aviation activity listed in Annex I or, where the operator is not known or is not identified by the owner of the aircraft, the owner of the aircraft. The ICAO designator should be used to identify the operator wherever possible (proposed addition based on discussion in section 5.1);



- ‘flight’ means an activity listed in Annex I as ‘operation of an aircraft from take-off to its next landing’, as defined by ICAO. Thus take-off is the aerodrome of departure, and next landing is the aerodrome of arrival;
- ‘aerodrome of departure’ means the aerodrome from which an aircraft performing an activity listed in Annex I leaves’, whether or not this is the original aerodrome of departure for the entire flight. This is a component of an entire flight; including that falling outside the EU’s airspace.
- ‘aerodrome of arrival’ means the aerodrome at which an activity listed in Annex I arrives. This is a component of an entire flight; including that falling outside the EU’s airspace.
- ‘Mass and Balance documentation’ means the documentation specified under JAR-OPS Section 1 Subpart J;
- ‘passengers’ means the number of persons onboard excluding crew members;
- ‘payload’ means the total mass of freight, mail and passengers carried;
- ‘distance’ means the great circle distance between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95 km;
- ‘tonne-kilometre’ means a tonne of payload carried a distance of one kilometre.

## 6.2 Monitoring and reporting principles

### ► Use amended version of monitoring and reporting principles for the new Commission Decision.

- **Completeness.** Monitoring and reporting of tonne-kilometre data for aircraft operators shall cover all flights from activities listed in Annex I to Directive 2003/87/EC while avoiding double-counting;
- **Consistency.** Monitored and reported tonne-kilometre activity data shall be comparable for each period, using the same monitoring methodologies and data sets. Monitoring methodologies can be changed in accordance with the provisions of these Guidelines if the accuracy of the reported data is improved. Changes in monitoring methodologies shall be subject to approval from the competent authority and shall be fully documented in accordance with these guidelines;
- **Transparency.** Monitoring data, including assumptions, references, distance data and payload data shall be obtained, recorded, compiled, analysed and documented in a manner that enables the reproduction of the determination of tonne-kilometre activity by the verifier and the competent authority;
- **Trueness.** It shall be ensured that the tonne-kilometre data determination is systematically neither over nor under true activity. Sources of uncertainties shall be identified and reduced as far as



practicable. Due diligence shall be exercised to ensure that the calculation and measurement of tonne-kilometre data exhibit highest achievable accuracy. The operator shall enable reasonable assurance of the integrity of reported tonne-kilometre data to be determined. Tonne-kilometre data shall be determined using the appropriate monitoring methodologies set out in these Guidelines. All metering or other testing equipment used to report monitoring data shall be appropriately applied, maintained and calibrated, and checked. Spreadsheets and other tools used to store and manipulate monitoring data shall be free from error. Reported tonne-kilometre activity data and related disclosures shall be free from material misstatement, avoid bias in the selection and presentation of information, and provide a credible and balanced account of an aircraft operator's activity;

- **Cost effectiveness.** In selecting a monitoring methodology, the improvements from greater accuracy shall be balanced against the additional costs. Hence, monitoring and reporting of tonne-kilometre data shall aim for the highest achievable accuracy, unless this is technically not feasible or will lead to unreasonably high costs. The monitoring methodology itself shall describe the instructions to the aircraft operator in a logical and simple manner, avoiding duplication of effort and taking into account the existing systems used by the aircraft operator;
- **Faithfulness.** A verified tonne-kilometre data report shall be capable of being depended upon by users to represent faithfully that which it either purports to represent or could reasonably be expected to represent;
- **Improvement of performance in monitoring and reporting activity data.** The process of verifying the activity data reports shall be an effective and reliable tool in its support of quality assurance and quality control procedures, providing information upon which an aircraft operator can act to improve its performance in monitoring and reporting tonne-kilometre data.

## 6.3 Monitoring tonne-kilometre data

### Boundaries

- ▶ **The ICAO designator will be used to determine aircraft operators. Guidance will be needed for aircraft owners for aircraft that are not covered by the ICAO system.**

### The Monitoring Plan

In order to allow verifiers to perform their role properly and to assure the quality of the process, monitoring plans should be approved six months before the **start** of the monitoring period. This requirement should be applied uniformly across all member states to avoid negative distributional impacts. At the very least, it should be specified that monitoring plans must be approved before the start of the monitoring period.

- ▶ **Specify that monitoring plans must be approved before the start of the monitoring period**



► **Include details of tonne-kilometre monitoring plan requirements based on the existing requirements for emissions monitoring plan requirements**

“Pursuant to Article 3d(b) of Directive 2003/87/EC aircraft operators shall submit a monitoring plan setting out measures to monitor and report tonne-kilometre data.

The monitoring methodology is part of the monitoring plan which shall be approved by the competent authority in accordance with the criteria set out in this Annex.

The competent authority shall check and approve the monitoring plan prepared by the aircraft operator before the start of the reporting period, and again after any substantial changes to the monitoring methodology.

The monitoring plans shall contain:

- i. the description of the aircraft operator, aircraft operated and routes operated;
- ii. information on responsibilities for monitoring and reporting within the control of the aircraft operator;
- iii. a description of the calculation-based methodology used;
- iv. a description of the methodology applied to distance calculations;
- v. a list and description of the methodology applied to payload calculations including a description of any measurement systems;
- vi. a description of the procedures for data acquisition, handling activities and control activities (such as calibration of weighing equipment) as well as a description of the activities to be performed during the monitoring year.

The monitoring methodology shall be changed if this improves the accuracy of the reported data, unless this is technically not feasible or would lead to unreasonably high costs.

All changes and proposed changes in monitoring methodology or the underlying data sets shall be notified to the competent authority without undue delay after the aircraft operator has become aware of it or could in all reasonableness have become aware of it, unless otherwise specified in the monitoring plan.

Changes to the monitoring plan shall be clearly stated, justified and fully documented in internal records of the operator.

A competent authority shall require the aircraft operator to change its monitoring plan if its monitoring plan is no longer in conformity with the rules laid down in these Guidelines.”



## 6.4 Methodologies

### Calculation formulae

#### ► Calculation formula and units should be specified

“Calculation of tonne-kilometre data shall be based on the following formula:

$$\text{Tonne kilometres (tkm)} = \text{distance (km)} \times \text{payload (t)}$$

Where:

‘Distance’ means the great circle distance between the aerodrome of departure and the aerodrome of arrival plus an additional fixed factor of 95 km

‘Payload’ means the total mass of freight, mail and passengers carried”

### Tiers of approaches

- **Where industry defaults, standards and Eurocontrol data is used, no tiers will be required.**
- **Further assessment may be required on the use of tiers for issues such as for the calculation of freight and mail mass where data from Mass & Balance documentation is unavailable.**

If tiers are adopted for certain calculations, then the following may apply:

- The operator may apply different approved tier levels to the different variables used within a single calculation. The choice of tiers shall be subject to approval by the competent authority.
- The highest tier approach shall be used by all operators to determine all variables. Only if it is shown to the satisfaction of the competent authority that the highest tier approach is technically not feasible or will lead to unreasonably high costs, may a next lower tier be used for that variable within a monitoring methodology.
- The operator shall without undue delay propose changes to the tiers applied when:
  - Accessible data has changed, allowing for higher accuracy in the determination of tonne-kilometre data;
  - Errors were detected in data resulting from the monitoring methodology;



- The competent authority has requested a change.
- If the highest tier methodology is temporarily not feasible for technical reasons, an operator may apply the highest achievable tier until such time as the conditions for application of the former tier have been restored. The aircraft operator shall, without undue delay, provide proof of the necessity for a change of tiers to the competent authority and details of the interim monitoring methodology. The operator shall take all necessary action to allow the prompt restoration of the original tier for monitoring and reporting purposes. Operators may account for gaps in data using the appropriate fall back calculations (as outlined in section 5.2 of the MRG 2007).

## Distance

Guidance is needed on two issues. First, to establish whether the existing dataset(s) should be utilised for obtaining GCDs.

- ▶ **Operators should use Eurocontrol data where available for their aerodrome pairs.**
- ▶ **Consultation with Eurocontrol will be required to determine how this data will be accessed.**
- ▶ **Require aircraft operators to clearly state their data source for GCDs.**

And second, in those cases where the existing dataset(s) do not have an entry for a particular aerodrome pair, the method to adopt to calculate GCDs is:

- ▶ **Preferred method is to require GCD calculations to assume a spheroidal Earth**
- ▶ **The minimum requirement should be for GCD calculations to assume a spherical Earth**

## Payload

Clarification should be provided for the reporting of payload data and specifically for Passenger and Checked Baggage data. Freight and Mail mass should be reported and these figures should be taken from Mass and Balance documentation where available. Where this documentation is not available, further guidance should be provided.

- ▶ **Specify that aircraft operators must report their payload data under 2 headings: Freight and Mail; and Passengers and Checked Baggage.**
- ▶ **Clarify that operators may choose their method for reporting Passenger and Checked Baggage data.**



- **Specify that operators must use the same payload values as recorded in their Mass and Balance documentation where available.**

“Payload shall be calculated using the following formula:

$$\text{Payload (t)} = \text{mass of Freight and Mail (t)} + \text{mass of Passengers and Checked Baggage (t)}$$

## Mass of Passengers and Checked Baggage:

For Passenger and Checked Baggage mass, aircraft operators may select from the following methods:

- **Actual mass method.** Actual mass of passengers and baggage as calculated.
- **Standard mass method.** Standard mass for passengers and checked baggage contained in its Mass and Balance documentation.
- **Default value method.** A default value for each passenger and their checked baggage of 100 kg.”

## Mass of Freight and Mail:

For mass of Freight and Mail, the actual mass should be used, where available this should be the actual mass contained in its Mass and Balance Documentation data. Where Mass and Balance documentation is not available, a tiering system as included could be adopted, but this requires further investigation:

### *Tier 1*

The Freight and Mail mass over the reporting period shall be determined with a maximum uncertainty of  $\pm 7.5\%$ .

### *Tier 2*

The Freight and Mail mass over the reporting period shall be determined with a maximum uncertainty of  $\pm 5\%$ .

### *Tier 3*

The Freight and Mail mass over the reporting period shall be determined with a maximum uncertainty of  $\pm 2.5\%$ .

### *Tier 4*

The Freight and Mail mass over the reporting period shall be determined with a maximum uncertainty of  $\pm 1.5\%$ .”



## 6.5 Uncertainty assessment

- ▶ **Provide guidance on how to assess uncertainty in tonne-kilometre data MRV in line with the MRG 2007**

“The aircraft operator shall have an understanding of main sources of uncertainty when calculating tonne-kilometre data.

The competent authority will have approved the combination of tiers. In doing so, the competent authority has authorised the uncertainty directly resulting from correct application of the approved monitoring methodology. Stating the combination of tiers in the tonne-kilometre report shall constitute reporting uncertainty for the purposes of Directive 2003/87/EC.

The uncertainty determined for the measurement system within the tier system shall comprise the specified uncertainty of the applied measurement instruments, uncertainty associated with the calibration and any additional uncertainty connected to how the measurement instruments are used in practice. The stated threshold values within the tier system refer to the uncertainty associated to the value for one reporting period.

The aircraft operator shall provide written proof of the uncertainty level associated with the determination of distance and payload data in order to demonstrate compliance with the uncertainty thresholds defined above. The operator shall base the calculation on the specifications as provided by the supplier of the measurement instruments. If these specifications are not available, the operator shall provide for an uncertainty assessment of the measurement instrument. In both cases, he shall take into account necessary corrections of these specifications from effects resulting from the actual use conditions like ageing, conditions of the physical environment, calibration and maintenance. These corrections may involve conservative expert judgement.

If measurement systems are applied, the aircraft operator shall take into account the cumulative effect of all components of the measuring system on the uncertainty of the annual activity data using the error propagation law which yields two convenient rules for combining uncorrelated uncertainties under addition and multiplication or respective conservative approximations if interdependent uncertainties occur:”<sup>14</sup>

## 6.6 Reporting

- ▶ **Reiterate required content for tonne-kilometre data reporting.**

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<sup>14</sup> Sections 7.1(a) and 7.1(b) from the MRG 2007 Decision would be also included without amendment



## 6.7 Retention of information

- ▶ **Require tonne-kilometre reports to be retained for 10 years.**

## 6.8 Control and verification

- ▶ **The control and verification methodology outlined in Section 10 of the MRG 2007 Decision should be replicated in guidance on tonne kilometre data.**

## 6.9 Requirements for smaller operators

- ▶ **Explore options for reducing costs for smaller operators.**

## 6.10 Special reserve applications

- ▶ **Clarify that the applications to the special reserve should be in line with the provisions of this guidance.**
- ▶ **Determining eligibility with the special reserve should coincide with the requirements outlined in the proposed monitoring plan.**



## 7. Administrative costs

### 7.1 Overview

One of the key principles of monitoring and reporting is to ensure that the process does not impose unreasonable costs upon operators and/or CAs while still achieving the highest accuracy level possible. Increasing the cost-effectiveness of the guidelines without compromising accuracy can ensure that all parties involved are able to meet their obligations at a reduced cost. This section will therefore examine the potential administrative cost implications of MRV for annual aviation emissions for the different parties involved.

(More detail on costs is outlined in the report for annual emissions.)



## Appendix A Glossary

Term	Definition
CA	Competent Authority
ETS Aviation proposal	Commission Proposal COM(2006)818 to amend the EU ETS Directive to include aviation activities, and the most recent amendments via the codecision procedure 2006/0304(COD).
EU ETS Review proposal	Commission Proposal COM(2008)16 to amend the EU ETS Directive so as to improve and extend the greenhouse gas emission allowance trading system of the Community. This proposal was announced following the review of the EU ETS.
EU ETS Directive	Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending the Council Directive 96/91/EC.
GCD	Great Circle Distance.
JAR-OPS	Joint Aviation Requirement for the operation of commercial air transport.
MRG 2007	The Commission Decision 2007/589/EC establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.
MRV	Monitoring, reporting and verification
MS	Member State
NAP	National Allocation Plan

