



ICAO

International Civil Aviation Organization  
North American, Central American and Caribbean Office

WORKING PAPER

NACC/WG/4 — WP/34  
06/03/14

**Fourth North American, Central American and Caribbean Working Group Meeting  
(NACC/WG/4)**  
Ottawa, Canada, 24 to 28 March 2014

**Agenda Item 3: Follow-up on the NAM/CAR Regional Performance-Based Air Navigation  
Implementation Plan (NAM/CAR RPBANIP) Progress**  
**3.5.2 National Plan Reports on Aviation System Block Upgrades (ASBU)  
Implementation**

**ICAO Fuel Savings Estimation Tool (IFSET)**

(Presented by Secretariat)

<b>EXECUTIVE SUMMARY</b>	
This paper provides a summary of current ICAO activities related to initiatives to assist States in the use of the ICAO Fuel Savings Estimation Tool (IFSET) and to help to evaluate scenarios for future emissions. Information on recent ICAO environmental developments is also provided.	
<b>Action:</b>	Action in paragraph 5
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Environmental Protection</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• <i>Global Air Navigation Plan</i> (Doc 9750)</li><li>• <i>Operational Opportunities to Minimize Fuel Use and Reduce Emissions</i> (ICAO Circular 303)</li><li>• <i>ICAO Environmental Report 2007</i></li><li>• <i>ICAO Environmental Report 2010, Aviation and Climate Change</i></li><li>• <i>ICAO Environmental Report 2013, Aviation and Climate Change</i></li><li>• Operational improvements informed by COCESNA, December 2013</li></ul>

## 1. Introduction

1.1 Increasingly, people and organizations worldwide are interested in understanding the carbon footprint associated with their air travel and how they might reduce it in the future. ICAO has delivered accurate, impartial tools to fill this need. Today, the ICAO environmental tool suite comprises four modules. Two of these provide information on past emissions namely, the ICAO Carbon Emissions Calculator and the ICAO CO<sub>2</sub> Reporting and Analysis System (ICORAS), while the other two, specifically ICAO Green Meetings Calculator (IGMC) and ICAO Fuel Savings Estimation Tool (IFSET), help to evaluate scenarios for future emissions.

1.2 Operational measures are among the instruments available to States to improve fuel efficiency and reduce CO<sub>2</sub> emissions. Historically, however, those States and air navigation service providers aiming to implement operational changes had essentially two options for estimating the fuel savings associated with a proposed change: (1) the use of sophisticated models or (2) the ICAO rules of thumb (see *ICAO Environmental Report 2007* at the following address: <http://bit.ly/1ghMMHu>). The ICAO IFSET has been developed by the Secretariat with support from States and international organizations to bridge the gap between those two extremes in order to assist States in estimating fuel savings in a manner consistent with the models approved by ICAO's Committee on Aviation Environmental Protection (CAEP) and aligned with the *Global Air Navigation Plan*.

## 2. ICAO's Fuel Savings Estimation Tool (IFSET)

2.1 Against a background of increasing concern regarding the impact of aircraft engine emissions on the environment, the ability to adequately estimate fuel burn and emissions savings accrued from operational improvements being put in place by all members of the ATM community on a system wide scale is of high importance. Operational improvements are a key strategy that can be applied to deliver tangible reductions in aircraft fuel consumption. The *Global Air Navigation Plan* (Doc 9750) and the *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* (Circular 303) are among several documents providing guidance regarding operational improvements being implemented to enhance efficiency of the ATM System. However, to-date, a tool to assist those States without an automated means to estimate, model or report those benefits in a harmonized way, has not been available. ICAO created this *User's Guide* that details the steps that the user of this application follows to generate the estimated fuel savings from the implementation of operational improvements.

2.2 This *Guide* describes the IFSET developed to be applicable globally with the ability to capture the difference in flight trajectory performance in terms of fuel consumption before and after implementation of operational improvements at local, regional or global level. The tool is to assist the States to estimate and report fuel savings consistently with the models approved by ICAO's CAEP and aligned with the *Global Air Navigation Plan*. The IFSET *User's Guide* can be access at the following web address: <http://bit.ly/1ld1ss4>.

2.3 IFSET is not intended to replace the use of detailed measurement or modelling of fuel savings, where those capabilities exist. Rather, it is provided to assist those States without such capabilities to estimate the benefits from proposed operational improvements in a harmonized way. IFSET allows users to build both pre- and post-implementation scenarios using a series of flight phase procedure “building blocks”: climb, level, descent and taxi. In addition, the mix of aircraft operating on the procedures is defined. The fuel consumption from those scenarios is then computed for each scenario based on pre-computed data from the US FAA’s Aviation Environmental Design Tool.

### **3. Operational improvements by COCESNA measured using the IFSET**

3.1 The continued growth in air travel in the airspace controlled by the Central American Corporation for Air Navigation Services (COCESNA) whose member States are: Belize, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua have placed greater demand on the region’s Air Traffic Management (ATM) system. To respond to the expectations of airspace users, constant improvements to the ATM system are necessary to enhance efficiency, while maintaining or improving safety levels. As part of the plan to improve the efficiency of the ATM system in the Central American sub-region, since 2011 COCESNA implemented a new Area Navigation (RNAV) and all the 18 RNAV 10 routes in the CENAMER FIR/UIR (COCESNA) became RNAV 5, which helped optimized the use of the airspace. As an example, El Salvador established improved arrival and departure flows that helped in the climb and descend part of the flight; this allowed more freedom in managing these phases of flight.

3.2 COCESNA in coordination with its six Member States has undertaken several initiatives to redesign airspace and implement new concepts of operations to increase capacity, measures which aim to cope with predicted air traffic growth. All of the initiatives seek to address the expectations of the aviation community, through better provision of air traffic services, and improved airspace management. Using advanced capabilities on board aircraft, along with enhanced processes to manage air traffic, separation minima and distances between city pairs could be reduced. Also, in light of better use of wind direction, flying time was reduced, fuel was saved and the impact on climate change was reduced through emissions reductions. This represents a step towards the achievement of global goals to reduce the impact of aviation on climate change.

### **4. Recent ICAO Environmental Developments**

4.1 In reference to the conclusion ANI/WG 1/7 *ASISSTANCE FOR IFSET TRAINING* that covered E/CAR/CATG Conclusion 1/4 *Assistance for Training on ICAO Fuel Savings Estimation Tool (IFSET)*, ICAO NACC Regional Office conducted with the support of ICAO HQ and the Civil Air Navigation Organization (CANSO), four online training sessions of IFSET from 28 to 29 November 2013. The outcome of these 4 training sessions promoted and ensured an appropriate use of the IFSET, a better understanding on the use of the IFSET tool (CCO, CDO and ATS route exercises) and identification of improvements to IFSET tool. The taxi exercise was just commented. States were informed that in case there is a need for assistance for another online IFSET training they can request it to ICAO NACC Office for scheduling a new session during 2014.

4.2 ICAO will convene its International Aviation and Environmental Seminar being held from 1-2 April 2014 and the ICAO State Action Plan Seminar being held from 3-4, at the ICAO NACC Regional Office, Mexico City, Mexico. The first Seminar will provide participants with information on present and future impact and trend assessments of aircraft engine noise; the work of the CAEP; and ICAO policies and guidance material in the environmental field. The Second Seminar will focused on national action plan focal points with information on how to develop and update State action plans, with a focus on data collection and mitigation measures undertaken by States. This event is reserved only for national focal points that have been nominated by their respective State.

## **5. Action by the Meeting**

5.1 The Meeting is invited to:

- a) continue to consider environmental issues in the planning and implementation of regional air navigation systems; and
- b) States are reminded in case assistance is needed for another online IFSET training to inform the NACC Regional Office.

— END —