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

WORKING PAPER

NACC/DCA/5 — WP/16
08/04/14

Fifth North American, Central American and Caribbean Directors of Civil Aviation Meeting (NACC/DCA/5)

Port-of-Spain, Trinidad and Tobago, 28 to 30 April 2014

Agenda Item 9: Environment

9.1 National Action Plan – Implementation Status and Benefits Report

9.2 ICAO Fuel Savings Estimation Tool (IFSET) Online Training

9.3 ICAO International Aviation and Environmental Seminar, State Action Plan Seminar and Volcanic Ash Seminar

ENVIRONMENTAL MATTERS

(Presented by the Secretariat)

EXECUTIVE SUMMARY

This working paper provides a summary of current ICAO activities related to the environment including initiatives to assist States. Assistance was provided to State focal points through training provided during the recently concluded ICAO seminars on international aviation, environment and State Action Plans conducted at the ICAO NACC Regional Office. Information was also provided on the upcoming online training regarding the use of the ICAO Fuel Savings Estimation Tool (IFSET), which will help States evaluate future emissions scenarios. The Central American Corporation for Air Navigation Services (COCESNA) provided information on the implementation of new Area Navigation (RNAV) and all of the 18 RNAV-10 routes in the Central American Flight Information Region (FIR).

Action:	In paragraph 6
Strategic Objectives:	• Safety • Environmental Protection
References:	• *Global Air Navigation Plan* (Doc 9750) • Circular 303 — *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* • Doc ENVREP — ICAO Environmental Report — 2007 • Doc ENVREP — ICAO Environmental Report — 2010 • Doc ENVREP — ICAO Environmental Report — 2013 • Information obtained through communication with COCESNA - December 2013

1. Introduction

1.1 Increasingly, people and organizations worldwide are interested in understanding the carbon footprint associated with 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 is comprised of four modules. Two of these provide information on past emissions - the ICAO Carbon Emissions Calculator and the ICAO CO_2 Reporting and Analysis System (ICORAS) - while the other two evaluate scenarios for future emissions - ICAO Green Meetings Calculator (IGMC) and ICAO IFSET.

1.2 Operational measures are among the instruments available to States to improve fuel efficiency and reduce CO_2 emissions. Historically, those States and air navigation service providers essentially had two options available for estimating the fuel savings associated with a proposed change: (1) the use of sophisticated models; or (2) the ICAO rules of thumb (see Doc ENVREP — ICAO Environmental Report — 2007, which can be found at the following web address: http://www.icao.int/environmental-protection/Documents/Env_Report_07.pdf). IFSET has been developed by the ICAO Secretariat with support from States and international organizations to bridge the gap between the two extremes [above-mentioned (1) and (2)] in order to assist States with estimating fuel savings in a manner consistent with the model approved by ICAO's Committee on Aviation Environmental Protection (CAEP) and aligned with the *Global Air Navigation Plan*.

2. Operational Improvements by COCESNA

2.1 Continued air travel growth in the airspace controlled by COCESNA, whose member States are: Belize, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, has placed greater demand on the region's Air Traffic Management (ATM) system. To effectively manage the increased demand of airspace users, constant improvements to the ATM system are necessary to optimize efficiency while maintaining and improving safety levels. As part of the plan to improve ATM system efficiency in the Central American sub-region, COCESNA has been implementing Area Navigation (RNAV) since 2011, and all 18 RNAV-10 routes in the Central American FIR/UIR became RNAV-5, which resulted in airspace use optimization. As an example, El Salvador established improved arrival and departure flows that increased efficiency in the climb and descent phase of flights.

2.2 COCESNA, in coordination with its six member States, has undertaken several initiatives to redesign their airspace and implement new operational concepts to increase capacity with measures that 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 onboard aircraft along with enhanced processes to manage air traffic, separation minima and distances between city pairs can be reduced. In light of better use of wind direction (using upper wind forecast when flight planning), flying time was reduced, fuel savings were realized and environmental impact was reduced through emissions reduction. This represents a step towards the achievement of global goals to reduce the adverse impact of aviation on climate change.

3. ICAO Fuel Savings Estimation Tool (IFSET)

3.1 IFSET is not intended to replace the use of detailed measurement or modelling of fuel savings where those capabilities exist. Rather it provides assistance to 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," i.e., climb, level, descent and taxi. In addition, the mix of aircraft operating in the procedures is defined. The fuel consumption from those scenarios is then computed for each scenario based on pre-computed data from the U.S. FAA Aviation Environmental Design Tool.

3.2 Against a background of increasing concern regarding the adverse impact of aircraft engine emissions on the environment, the ability to adequately estimate fuel burn and emissions savings accrued from operational improvements recommended by all members of the ATM community on a wide scale system 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 a IFSET User's Guide that details the steps that the user of this application must follow to generate the estimated fuel savings from the implementation of operational improvements.

3.3 This Guide describes the IFSET that was developed to be applied globally with the ability to capture the difference in flight trajectory performance in terms of fuel burn before and after implementation of operational improvements at the local, regional or global levels. The tool assists States with estimating and reporting 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 accessed at the following web address: http://bit.ly/1ld1ss4

4. RASG-PA - VOLARIS Seminar on Volcanic Ash

4.1 Volcanic ash is a serious hazard for flight operations. Encounters with volcanic ash can, in some instances, result in flight safety issues such as engine malfunctions; subsequent electrical failure; pneumatic and hydraulic system malfunctions; sensor blocking resulting in erroneous airspeed indications, communication problems, amongst many others.

4.2 In order to support CAR State efforts in improving communication links between volcano observatories, air navigation and meteorological service providers, there is a need to be fully aware of the negative effects of volcanic ash on aircraft. Volcanic ash information needs to be disseminated in an efficient and timely manner to all operators. Due to the need to improve products issued by volcano observatories in support of the International Airways Volcano Watch (IAVW) and understand the associated safety risks and adverse effect on the efficiency of international air navigation, a Regional Aviation Safety Group-Pan America (RASG-PA) safety seminar – *The Impact of Volcanic Activity in Aviation* - was jointly held with Volaris Airlines in August 2013 in Mexico City. This event included different specialists from the ICAO NACC Regional Office, stakeholders and academic institutions.

4.3 Due to the need to present the latest development in this field, the NACC Regional Office has planned to organize another volcanic ash seminar jointly with Volaris Airlines. This seminar has been tentatively scheduled for the last week of September 2014 in Mexico City, Mexico.

5. Recent ICAO Environmental Developments

5.1 In reference to Conclusion 1/7 of the Air Navigation Implementation Working Group (ANI/WG) - *Training Assistance for IFSET* - that covered Conclusion 1/4 of the Eastern Caribbean Civil Aviation Technical Group (E/CAR/CATG) - *Assistance for Training on ICAO Fuel Savings Estimation Tool (IFSET)*, the ICAO NACC Regional Office, with support from ICAO HQ and the Civil Air Navigation Services Organization (CANSO), conducted four online training sessions on IFSET from 28 to 29 November 2013. The outcome of these four training sessions promoted appropriate use and understanding of the IFSET [Continuous Climb Operations (CCO), Continuous Descent Operations (CDO) and Air Traffic Service (ATS) route exercises] and identified IFSET improvements were informed that in case there is a need for additional online IFSET training, a new session can be requested from the ICAO NACC Office for scheduling during the latter part of 2014.

5.2 ICAO convened the International Aviation and Environmental Seminar from 1-2 April and the ICAO State Action Plan Seminar from 3-4 April 2014, at the ICAO NACC Regional Office, Mexico City, Mexico. The first seminar provided participants with information on present and future impact and trend assessments of aircraft engine noise, CAEP work, and ICAO policies and guidance material in the environmental field. The second seminar focused on national action plan focal points and information on how to develop and update State action plans with focus on data collection and mitigation measures undertaken by States. The second event was only provided to national focal points that were nominated by their respective State. Over 52 participants attended the first seminar, and more than 18 NAM/CAR States attended the action plan seminar. From the assessment of both seminars, the participants considered these training events to be an excellent opportunity.

6. Action by the Meeting

6.1 The Meeting is invited to:

a) continue considering environmental issues in the planning and implementation of regional air navigation systems;

b) encourage those States that choose to prepare or update their action plans to submit them to ICAO as soon as possible, preferably by the end of June 2015 and once every three years thereafter;

c) encourage individual States to submit their voluntary action plans outlining their respective policies and actions, and annually report on international aviation CO_2 emissions to ICAO; and

d) note that States are reminded that if there is a need for additional online IFSET training, to inform the ICAO NACC Regional Office accordingly.

— END —