



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**THE MIDDLE EAST AIR NAVIGATION PLANNING  
AND IMPLEMENTATION REGIONAL GROUP  
(MIDANPIRG)**

**REPORT OF THE SECOND MEETING OF THE  
AIR TRAFFIC MANAGEMENT PERFORMANCE MEASUREMENT  
TASK FORCE**

**APM TF/2**

*(Cairo, Egypt, 10 -11 November 2014)*

The views expressed in this Report should be taken as those of the MIDANPIRG Task Force and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

Approved by the Meeting  
and published by authority of the Secretary General

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## **PART I – HISTORY OF THE MEETING**

### **1. PLACE AND DURATION**

1.1 The Second meeting of the Air Traffic Management Performance Measurement Task Force (APM TF/2) was held at the ICAO Middle East Regional Office in Cairo, Egypt, 10-11 November 2014.

### **2. OPENING**

2.1 The Meeting was opened by Mr. Mohamed Smaoui, Deputy Regional Director, ICAO Middle East Regional Office, who extended a warm welcome to all participants to Cairo. Mr. Smaoui highlighted the Terms of Reference (TOR) and the main objective of the APM Task Force, in particular the development of the MID Region Air Navigation Environmental Report; which presents and records the environmental benefits accrued from the implemented operational improvements in the MID Region. He emphasized the importance of the States and Users contribution in the development of the Report through the provisions of their ICAO Fuel Estimation Tool (IFSET) Reports.

2.2 Mr. Smaoui raised concerns related to the low level of attendance, in addition to the challenges faced by the Secretariat for the collection of the States' inputs. In this regard, he encouraged the participants to benefit from their presence by sharing their views/experience and to practice the IFSET with the assistance of the Secretariat. Furthermore, Mr. Smaoui urged the States to cooperate effectively with the Secretariat for the development of the Draft Second MID Region Air Navigation Environmental Report, which should be presented to the First meeting of the Air Navigation Systems Implementation Group (ANSIG/1), Cairo, Egypt, 10-12, February 2015 for review and thereafter to MIDANPIRG/15, Bahrain, 8-11 June 2015, for endorsement.

2.3 Mr. Smaoui indicated that the development of the States' Action Plans for CO<sub>2</sub> emissions might be beyond the responsibilities of the ATM experts. However, the APM Task Force provides an opportunity for the States to present the status of their Action Plans. Accordingly, he invited the participants to attend the Seminar on International Aviation, Environment and States' Action Plans, which is planned to be held in Dubai, UAE, 23-25 March 2015.

2.4 Finally Mr. Smaoui wished the meeting every success in its deliberations.

### **3. ATTENDANCE**

3.1 The meeting was attended by a total of Fifteen (15) participants, including experts from five (5) States (Bahrain, Egypt, Kuwait, Saudi Arabia and Sudan) and one (1) International Organization (IATA). The list of participants is at **Attachment A**.

### **4. OFFICERS AND SECRETARIAT**

4.1 The meeting was chaired by Mr. Dawood Al-Jarrah, Superintendent of Planning and Control Department, Directorate General of Civil Aviation, Kuwait. Mr. Elie El Khoury, Regional Officer ATM/SAR and Mr. Abbas Niknejad, Regional Officer AIM/ATM, acted as Secretaries of the meeting, supported by Mr. Mohamed Smaoui, ICAO Deputy Regional Director.

**5. LANGUAGE**

5.1 Discussions were conducted in English and documentation was issued in English.

**6. AGENDA**

6.1 The following Agenda was adopted:

Agenda Item 1: Adoption of the Provisional Agenda

Agenda Item 2: Global and Regional developments related to operational improvement and environmental benefits

Agenda Item 3: Development of the Second MID Region Air Navigation Environmental Report

Agenda Item 4: Future Work Programme

Agenda Item 5: Any other business

**7. CONCLUSIONS AND DECISIONS – DEFINITION**

7.1 All MIDANPIRG Sub-Groups and Task Forces record their actions in the form of Conclusions and Decisions with the following significance:

- a) **Conclusions** deal with the matters which, in accordance with the Group's terms of reference, merit directly the attention of States on which further action will be initiated by ICAO in accordance with established procedures; and
- b) **Decisions** deal with matters of concern only to the MIDANPIRG and its contributory bodies.

**8. LIST OF CONCLUSIONS AND DECISIONS**

*DRAFT CONCLUSION 2/1: SECOND MID REGION AIR NAVIGATION ENVIRONMENTAL REPORT*

*DRAFT CONCLUSION 2/2: SINGLE ENGINE TAXI OPERATIONS*

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**PART II: REPORT ON AGENDA ITEMS**

**REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA**

1.1 The meeting reviewed and adopted the Provisional Agenda as at Para 6 of the History of the Meeting.

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**REPORT ON AGENDA ITEM 2: GLOBAL AND REGIONAL DEVELOPMENTS RELATED TO OPERATIONAL IMPROVEMENTS AND ENVIRONMENTAL BENEFITS**

2.1 The meeting was apprised of the outcome of the ICAO 38th General Assembly, Montreal, Canada, 24 September – 4 October 2013, related to environment, in particular Resolutions A38-17 and A38-18, which supersede Resolutions A37-18 and A37-19.

2.2 The meeting noted that the 38th Assembly highlighted the importance of reinforcing the voluntary nature of States' action plans on CO<sub>2</sub> emissions reduction. It encouraged States to voluntarily submit more complete and robust data in their action plans to facilitate the compilation of global emissions data by ICAO, and to make their action plans publically available. It also encouraged the partnerships among ICAO, States and other organizations to support the preparation of action plans, and emphasized the need for the Secretariat to provide further guidance and other technical assistance.

2.3 The meeting recognized that the action plan is a means for States to communicate to ICAO information on activities to address CO<sub>2</sub> emissions. The level of information contained in an action plan should be sufficient to demonstrate the effectiveness of actions and to enable ICAO to measure progress towards meeting the global goals set by Assembly Resolution A38-18. Action plans give States the ability to: establish partnerships; promote cooperation and capacity building; facilitate technology transfer; and provide assistance.

2.4 The meeting noted that only Iraq, Jordan and UAE have provided their action plans. In this respect and taking into consideration MIDANPIRG Conclusion 14/29, the meeting encouraged States to develop/update their Action Plans for CO<sub>2</sub> emissions and submit them to ICAO through the APER website on the ICAO Portal: <http://www.icao.int/environmentalprotection/Pages/action-plan.asp> with a copy to the ICAO MID Regional Office.

2.5 The meeting was informed that Bahrain will provide its action plan by 15 December 2014 and Sudan during the first half of 2015.

2.6 In connection with the above, the meeting encouraged States to attend the Seminar on International Aviation, Environment and States' Action Plans, planned to be held in **Dubai, UAE, 23-25 March 2015**.

2.7 The meeting noted IATA's willingness to support the environmental activities in the MID Region. In this respect, the meeting encouraged IATA to present a working paper related to the environmental benefits accrued from the measures undertaken by some Air Operators, to the First Meeting of the Air Navigation Systems Implementation Group (ANSIG/1), Cairo, 10-12 February 2015.

2.8 The meeting was apprised of the ICAO State Letters Ref AN 1/17 – 14/57 and AN 1/17 - 14/56 both dated 10 September 2014 at **Appendix 2A**, which include questionnaires related to environment benefits that would be accrued from the implementation of the Aviation System Block Upgrade (ASBU) Block 0 Modules; Noise certification of Unmanned Aircraft System, certification of fuel availability and composition of commercial fuel, in addition to two requests related to information on radar data and alternative fuels. Accordingly, the meeting urged States to provide their inputs, information and comments to ICAO by **31 December 2014**.

2.9 The meeting noted that ICAO recognized the difficulty faced by many States in assessing the environmental benefits of their investments in operational measures to improve fuel efficiency. Accordingly, ICAO, in collaboration with subject matter experts and other international



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organizations, developed the ICAO Fuel Savings Estimation Tool (IFSET). The tool is available free of charge on the ICAO website through the following link: <http://www.icao.int/environmental-protection/Pages/Tools.asp>. Accordingly, the meeting urged States and Users to use the IFSET for the estimation of the CO<sub>2</sub> emissions accrued from the planned/implemented operational improvements.

2.10 The meeting noted with appreciation that ICAO developed the Operational Opportunities to Reduce Fuel Burn and Emissions Manual (ICAO Doc 10013) and the Guidance on Environmental Assessment of Proposed Air Traffic Management Operational Changes Manual (ICAO Doc 10031).

2.11 The ICAO Doc. 10013 identifies and reviews various operational opportunities and techniques for minimizing fuel consumption, and therefore emissions, in civil aviation operations. It is based on the premise that the most effective way to minimize aircraft emissions is to minimize the amount of fuel used in operating each flight. This manual updates and replaces information previously provided in ICAO Circular 303 — Operational Opportunities to Minimize Fuel Use and Reduce Emissions published in 2004. This document contains information on current practices that are followed by aircraft operators, airport operators, Air Navigation Services Providers (ANSPs), other industry organizations and States, which are intended to minimize fuel use and reduce emissions from civil air transport. The manual is therefore aimed at airlines, airport operators, air traffic management and air traffic control service providers, airworthiness authorities, environmental agencies and other government bodies and interested parties.

2.12 On the other hand, the purpose of the ICAO Doc 10031 is to provide States, airport operators, Air Navigation Service Providers (ANSPs) and other stakeholders with environmental assessment guidance to support sound and informed decision making when analyzing proposed Air Traffic Management (ATM) operational changes. High-level principles related to the quantification of changes in aviation-related environmental impacts associated with air navigation service changes are collected in order to ensure a consistent approach to the analysis of the changes, while minimizing the risk of common assessment errors. This provides a framework within which specific, detailed assessment methodologies can be developed that meet local requirements, while facilitating global compatibility of results. It is also intended to assist with recognizing any environmental benefits associated with operational changes. While the guidance is intended to be applied broadly, it also highlights areas of priority that may need to be considered at the local level.

2.13 Based on the above, the meeting encouraged States and Users to use the guidelines provided in the ICAO Documents 10013 and 10031 when planning for the implementation of operational improvements and developing their associated environmental assessments.

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**REPORT ON AGENDA ITEM 3: DEVELOPMENT OF THE SECOND MID REGION AIR NAVIGATION ENVIRONMENTAL REPORT**

3.1 Implementation of operational improvements will generally have benefits in areas such as improved airport and airspace capacity, shorter cruise, climb and descent times through the use of more optimized routes and an increase of unimpeded taxi times. These improvements have the potential to reduce fuel burn and lower levels of pollutants.

3.2 The meeting was apprised of the outcome of MIDNPIRG/14 meeting, Jeddah, Saudi Arabia, 15-19 December 2013, related to environment. The meeting noted that MIDANPIRG/14 endorsed the First MID Region Air Navigation Environmental Report, at **Appendix 3A** and agreed to the following Conclusion in view to follow-up the implementation of operational improvements and the estimation of their corresponding environmental benefits:

*CONCLUSION 14/29: ESTIMATING AND REPORTING ENVIRONMENTAL BENEFITS*

*That, in order to follow-up the implementation of the ATM operational improvements and estimate the accrued fuel savings and associated CO<sub>2</sub> emission reduction from the corresponding improvements on regional basis:*

- a) States be encouraged to develop/update their Action Plans for CO<sub>2</sub> emissions and submit them to ICAO through the APER website on the ICAO Portal or the ICAO MID Regional Office;*
- b) States be urged to:*
  - i) identify the operational improvements which have been implemented within their FIR and/or international aerodromes;*
  - ii) collect necessary data for the estimation of the environmental benefits accrued from the identified operational improvements;*
  - iii) use IFSET to estimate the environmental benefits accrued from operational improvements; and*
  - iv) send the IFSET reports/the accrued environmental benefits to ICAO on bi-annual basis; and*
- c) IATA to:*
  - i) encourage users to support the APM TF in the development of the MID Region Air Navigation Environmental Reports; and*
  - ii) consolidate users' inputs and report the accrued environmental benefits to the ICAO MID Regional Office on bi-annual basis*

3.3 The meeting noted with concerns that the provisions of the above Conclusion have not been implemented, despite the follow-up actions undertaken by the ICAO MID Regional Office, in particular the issuance of the State Letter Ref: AN 6/15-14/247 dated 23 September 2014, urging States and Users to provide the ICAO MID Regional Office with their data related to the environmental benefits accrued from the implementation of operational improvements, before 20 October 2014, in order to be incorporated in the Second MID Air Navigation Environmental Report, which was supposed to be developed by the APM TF/2 meeting.

3.4 In connection with the above, the meeting raised concerns related to the low level of attendance to the APM TF meetings by the MID States. In this respect, it was highlighted that only Bahrain, Jordan, Kuwait and Sudan provided a list of their planned/implemented operational improvements, as at **Appendix 3B**. Nevertheless, it was underlined that the IFSET Reports related to these operational improvements should have been generated, which necessitate additional information to be provided by the concerned States.

3.5 Based on the above, the meeting underlined that the contribution of the States and Users to the work programme of the APM TF is essential in particular for the development of the Air Navigation Environmental Report. Accordingly, the meeting urged States and Users to take the necessary measures to comply with the Terms of Reference of the Task Force and ensure the implementation of the provisions of the MIDANPIRG Conclusion 14/29.

3.6 The meeting emphasized that future ATM plans should consider the environmental benefits and urged States to inform the ICAO MID Regional Office of all initiatives/programmes which will have positive impact on the environment.

3.7 Due to the low level of inputs received, the meeting agreed that the Draft Second MID Region Air Navigation Environmental Report would be consolidated by the Secretariat and presented to the ANSIG/1 meeting, Cairo, Egypt, 10-12 February 2015. Accordingly, the meeting urged all States and Users to provide their inputs/IFSET Reports for the implemented operational improvements in addition to the planned improvements for 2015 and beyond, to the ICAO MID Regional Office, before **10 January 2015**.

3.8 Based on the above, the meeting agreed to the following Draft Conclusion:

***DRAFT CONCLUSION 2/1: SECOND MID REGION AIR NAVIGATION ENVIRONMENTAL REPORT***

*That, States and Users be urged to provide their inputs/IFSET Reports to the ICAO MID Regional Office, before 10 January 2015, for the development of the Second MID Region Air Navigation Environmental Report to be consolidated by the Secretariat for presentation to the ANSIG/1 meeting.*

3.9 The meeting agreed that the Second MID Region Air Navigation Environmental Report be developed based on the format of the First Report including the information for the following periods:

- a) 2009-2012: just a listing of the operational improvements which have been implemented during this period and which had environmental benefits;
- b) 2013-2014: period to be used for the generation of the First Regional IFSET Report; and
- c) 2015 and beyond: listing of planned operational improvements which will have environmental benefits.

3.10 The meeting noted with appreciation that Bahrain issued AIP SUP Nr. 17/14 effective date 14 November 2014, related to the implementation of Single Engine Taxi Operations at Bahrain International Airport, as at **Appendix 3C**. In accordance with the survey conducted by Bahrain, emissions may vary between 22,000kg for medium category two engines aircraft and 88,000kg for heavy four engines aircraft.

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3.11 In connection with the above, the meeting recognized the impact of taxi operations on the environment. Accordingly, the meeting encouraged States to implement, as practicable, Single Engine Taxi Operations at their International Aerodromes and agreed to the following Draft Conclusion:

***DRAFT CONCLUSION 2/2: SINGLE ENGINE TAXI OPERATIONS***

*That,*

- a) States be encouraged to implement Single Engine Taxi Operations at their International Aerodromes, as practicable; as a possible measure for the reduction of CO<sub>2</sub> emissions; and*
- b) Bahrain be encouraged to share their experience on the subject with other States, as required.*

3.12 The meeting provided also an opportunity to raise awareness regarding the environmental activities and requirements; as well as a forum to share experience and to practice the IFSET.

3.13 The meeting encouraged States to organise at national level workshops related to the estimation of environmental benefits accrued from operational improvements with the support of ICAO and other interested stakeholders.

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**REPORT ON AGENDA ITEM 4: FUTURE WORK PROGRAMME**

4.1 The meeting agreed that, in accordance with the MIDANPIRG Procedural Handbook, and based on the Terms of Reference (TOR) of the APM Task Force, the APM TF/3 meeting would be tentatively scheduled for the First Quarter of 2016. The exact dates would be determined in due course. The venue would be the ICAO MID Regional Office premises in Cairo, unless a State indicates an interest in hosting the meeting.

4.2 The meeting reviewed the APM TF Terms of Reference (TOR) as at **Appendix 4A** and agreed that they are still valid and current.

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**REPORT ON AGENDA ITEM 5: ANY OTHER BUSINESS**

5.1 The meeting noted that Kuwait is moving all their ATM systems from paper-based to digital environment, which has a positive impact on environment (Savetree system).

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# *APPENDICES*



International  
Civil Aviation  
Organization

Organisation  
de l'aviation civile  
internationale

Organización  
de Aviación Civil  
Internacional

Международная  
организация  
гражданской  
авиации

منظمة الطيران  
المدني الدولي

国际民用  
航空组织

Ref.: AN 1/17 – 14/56

10 September 2014

**Subject:** ASBU Block 0 implementation questionnaire

**Action required:** Submit completed questionnaire to ICAO by 31 December 2014

Sir/Madam,

The fourth edition of the ICAO Global Air Navigation Plan (GANP, Doc 9750) represents a rolling fifteen-year strategy to guide complementary and sector-wide air transport improvements over the period 2013 to 2028. The GANP addresses required solutions by introducing a consensus-driven Aviation System Block Upgrade (ASBU) methodology.

In 2013, a high-level analysis of the potential environmental benefits from seven ASBU Block 0 modules was undertaken by the ICAO Committee on Aviation Environmental Protection (CAEP) which estimated that up to 4 million tonnes of fuel savings could be achieved from planned Block 0 module implementation. I am grateful for the positive State response to the 2013 survey on the implementation of ASBU Block 0, the results of which were published in the 2014 Air Navigation Report available at: <http://www.icao.int/airnavigation/pages/Air-Navigation-Report.aspx>.

The attached questionnaire will support a comprehensive ASBU Block 0 global environmental analysis currently underway by CAEP. The questionnaire is divided into questions per ASBU Performance Improvement Area, with each module with possible fuel savings individually targeted. For each module, the module's operational improvement is detailed along with questions designed to obtain the information required to advance the work described above.

The questionnaire is intended only to collect information on planned future actions in line with your current plans; your replies do not imply a firm commitment on your part to implement those actions.

Accept, Sir/Madam, the assurances of my highest consideration.

Raymond Benjamin  
Secretary General

**Enclosure:**  
CAEP ASBU Block 0 Implementation Questionnaire



**ATTACHMENT to State letter AN 1/17 - 14/56**

**Name:**

**State/Organization:**

**Email Address:**

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<b>Performance Improvement Area 1: Airport Operations</b>				
<b>B0-APTA</b>	<b>B0-WAKE</b>	<b>B0-RSEQ</b>	<b>B0-SURF</b>	<b>B0-ACDM</b>

**Block 0-APTA: *Optimization of Approach Procedures including vertical guidance***

**Operational Improvements:**

- a) Performance-based navigation (PBN) approaches: Radius to fix
- b) Reduced missed approaches and diversions due to lowered approach minima

**Questions**

		<b>Current</b>	<b>2018 (additional)</b>
1	List of airports* with implementation of radius to fix final approach.		
2	What percentage of operations in your State/region fly this procedure?		
3	List of airports* in your State/region with PBN final approaches implementation in order to provide improved access through improved minima (leading to a reduction in missed approaches/diversions).		
4	What percentage of operations benefit from a reduction in missed approaches at the aerodromes identified in question 3?		
5	How many commercial service airports in your State/Region do not have at least one Instrument Landing System (ILS) installed?		
6	What percentage of commercial operations in your State/region occur at the airports included in your response to question 5?		

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\*Please list international aerodromes published in the ICAO regional air navigation plans using their ICAO code.

**Block 0-WAKE: *Increased Runway Throughput through Optimized Wake Turbulence Separation***

**Operational Improvements:**

- a) Wake vortex separation standard re-categorisation (RECAT)
- b) Reduced wake vortex separation for closely spaced parallel runways ((CSPRs)

**Questions**

1	At which airports* in your State/region do you plan to implement RECAT prior to the end of 2018?	
2	What percentage of arrival and departure traffic would benefit from reduced wake vortex separation?	
3	Which airports* in your State/region have closely spaced parallel runways (CSPRs) with a non-aligned landing and departure zone (i.e. the wake of departures impacts the arrivals as the landing zone is in front of the departure zone)?	
4	Do these airports plan to implement reduced wake vortex separations on the CSPRs prior to the end of 2018?	

**Block 0-RSEQ: *Improved Runway Traffic Flow through Sequencing (AMAN/DMAN)***

**Operational Improvements:**

- a) Arrival manager (AMAN)
- b) Departure Manager (DMAN)

**Questions**

		Current	2018 (list additional)
1	List of airports* in your State/region operating an AMAN?		
2	List of airports* in your State/region operating an DMAN?		

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\*Please list international aerodromes published in the ICAO regional air navigation plans using their ICAO code.

**Block 0-SURF: *Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)***

**Operational Improvement:**

- a) Advanced Surface Movement Guidance Control System (A-SMGCS) Level 1 and 2

**Questions**

1	Which airports* in your State currently have implemented A-SMGCS level 1 and 2?	
2	Estimate the percentage of aircraft movements which are operating with A-SMGCS in your State/organization?	
3	Which additional airports* in your State/organization will implement A-SMGCS Level 1 and 2 in 2018?	
4	What percentage of aircraft movements do you estimate will be operating with A-SMGCS in your State in 2018?	

**Block 0-ACDM: *Improved Airport Operations through Airport-CDM***

**Operational Improvement:**

- a) Airport Collaborative Decision Making

**Questions**

1	Which airports* in your State currently have implemented A-CDM?	
2	Which airports* in your State plan to implement A-CDM prior to 2018?	

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\*Please list international aerodromes published in the ICAO regional air navigation plans using their ICAO code.

Performance Improvement Area 2: Global Interoperable Systems and Data		
B0-FICE		B0-DAIM

**Block 0-FICE: *Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration***

**Operational Improvement:**

- a) ATS inter-facility data communication(AIDC)

**Description:**

This module is to improve coordination between air traffic service units (ATSUs) by using ATS inter-facility data communication (AIDC). The transfer of communication in a data link environment improves the efficiency of this process particularly for oceanic ATSUs.

**Questions**

1	Has your State/ANSP implemented, or does it plan to implement, the FICE module (AIDC) prior to 2018?	
2	Will the implementation of AIDC result in reduced separation standards that can be applied between Air Traffic Service Units?	
3	Will the application of reduced separation result in the offering of more efficient flight levels to aircraft?	
4	To what percentage of aircraft could a potential more efficient level be offered?	
5	Has any estimation been undertaken of potential fuel-saving benefits that could be achieved as a result of the ability to offer aircraft more efficient flight levels due to the reduced separation being applied?	

**Block 0-DAIM: *Service Improvement through Digital Aeronautical Information Management*****Operational Improvement:**

- a) Digital NOTAM

**Description:**

The initial introduction of digital processing and management of information, through aeronautical information service (AIS) / aeronautical information management (AIM) implementation.

**Questions**

1	In your State, what percentage of aeronautical information, based on paper publications and NOTAMs, have moved from traditional provision of paper to electronic support?	
2	What percentage of operations in your State/region currently benefit from improved pre-flight briefing and from dynamic in-flight profile changes due to digital NOTAMs?	
3	Has any estimation been undertaken of the potential fuel saving benefits that could be achieved from dynamic in-flight profile changes due to the benefits identified in question 2?	
4	What percentage of aeronautical information, based on paper publications and NOTAMs, do you estimate in your State/Organization will have moved from traditional provision of paper to electronic AIP in 2018?	
5	What percentage of operations in your State/region do you estimate would benefit from improved pre-flight briefing and from dynamic in-flight profile changes due to digital NOTAMs in 2018?	

Performance Improvement Area 3: Optimum Capacity and Flexible Flights		
B0-FRTO	B0-NOPS	B0-ASUR

**Block 0-FRTO: *Improved Operations through Enhanced En-Route Trajectories***

**Operational Improvements:**

- a) Flexible Use of Airspace (FUA)
- b) Flexible Routes

**Questions**

1	Is FUA currently implemented in your State/region (please specify the geographical extent in terms of FIR) ?	
2	Is there a plan to implement or increase FUA in your State/region (please specify the geographical extent in terms of FIR) prior to 2018?	
3	How many track miles annually do you currently save as a result of FUA implementation or changes to validity periods for restricted airspace? What percentage of operations does this represent annually?	
4	How many track miles annually do you expect to save in 2018 as a result of FUA implementation or changes to validity periods for restricted airspace? What percentage of operations does this represent annually?	
5	Are flex routes (non-fixed) currently used in your State/region (please specify the geographical extent in terms of FIR or city pairs)?	
6	What is the estimated percentage of annual movements in your State/region (please specify) that currently fly on flex routes?	
7	Is there a plan to implement flex routes in your State/region (please specify the geographical extent in terms of FIR or city pairs) by 2018?	
8	What is the percentage of annual movements in your State/region (please specify) that it is estimated will fly on flex routes in 2018?	

**Block 0-NOPS: Improved Flow Performance through Planning based on a Network-Wide view****Operational Improvement:**

- a) Air Traffic Flow management (ATFM)

**Questions**

1	Is strategic traffic flow management currently used to manage runway/airspace slot allocation in your State/region? At all airports/airspace? Please specify where.	
2	How many flights are subject to the ATFM process?	
3	How much en-route delay did the ATFM measures save in 2013?	
4	How much airport arrival delay did the ATFM measures save in 2013?	
5	Will strategic traffic flow management be used to manage runway/airspace slot allocation in your State/region by the end of 2018? At all airports/airspace? Please specify where?	
6	How many flights will be subject to the ATFM process?	
7	How much en-route delay is it estimated that the ATFM measures will save in 2018?	
8	How much airport arrival delay is it estimated that the ATFM measures will save in 2018?	

**Block 0-ASUR: ADS-B Ground-Based and Satellite-Based Surveillance and MLAT****Operational Improvement:**

- a) Ground and Satellite-based surveillance through ADS-B leading to improved access to optimal flight levels

**Questions**

1	Is surveillance of en-route aircraft with ground-based ADS-B currently implemented in your State/region (please specify the geographical extent in terms of FIR)?	
2	Approximately what percentage of your State's/region's current operations would you estimate to operate in areas identified in question 1?	
3	Is the implementation of surveillance of en-route aircraft with ground-based ADS-B planned in your State/region by 2018 (please specify the geographical extent in terms of FIR)?	
4	Approximately what percentage of your State's/region's projected 2018 operations would you estimate to be operations that will operate in areas identified in question 3?	

Performance Improvement Area 4: Efficient Flight Path		
B0-CDO	B0-TBO	B0-CCO

**Block 0-CDO: *Improved Flexibility and Efficiency in Descent Profiles (CDOs)***

**Operational Improvements:**

- a) Continuous Descent Operations (CDO)
- b) PBN standard terminal arrival routes (STARs)

**Questions**

1	How many aerodromes in your State have currently published CDO procedures OR have CDO procedures tactically applied?	
2	What is the estimated percentage of arrival movements in your State that currently operate the CDO procedures OR have CDO procedures tactically applied?	
3	How many airports in your State do you estimate will have published CDO procedures OR have CDO procedures tactically applied in 2018?	
4	What is the estimated percentage of arrival movements in your State that will operate the CDO procedures in 2018 OR will have CDO procedures tactically applied?	
5	How many airports with PBN STARs currently operate in your State and how many do you estimate will do so in 2018?	
6	What is the estimated percentage of yearly traffic movements that currently fly on the published PBN STARs, and what is the estimated number expected to do so in 2018?	
7	For what reason were PBN arrival routes implemented (e.g. reduced track miles / increase capacity)?	



**Block 0-TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route****Operational Improvement:**

- a) En-route application of Data link

**Questions**

1	What proportion of your State's airspace is procedurally controlled, such as airspace in remote or oceanic areas?	
2	Is Data-link in operation in these areas?	
3	If Data-link is not in operation in these areas, is implementation planned prior to 2018?	
4	Is reduced horizontal separation minima planned to be implemented into the airspace identified prior to 2018?	
5	What is the estimated percentage of annual movements in your State that will operate in the area with reduced separation?	
6	Has your State identified any savings in fuel burn through the optimization of flight level due to reduction of horizontal separation?	
7	What percentage of airframes are/will be (by 2018) equipped with FANS 1/A+ avionics?	
8	How much delay is it estimated that CPDLC saved/will save (in 2018)?	

**Block 0-CCO: Improved Flexibility and Efficiency in Departure Profiles****Operational Improvements:**

- a) Continuous Climb Operations (CCO)
- b) PBN standard instrument departures (SIDs)

**Questions:**

1	How many airports in your State have currently published CCO procedures OR have CCO procedures tactically applied (i.e. have an uninterrupted climb profile from take-off to the top of climb)?	
2	What is the estimated percentage of departure movements in your State that currently have an uninterrupted climb profile from take-off to the top of climb?	
3	How many airports in your State do you estimate will have published CCO procedures OR have CCO procedures tactically applied in 2018 (i.e. have an uninterrupted climb profile from take-off to the top of climb)?	
4	What is the estimated percentage of departure movements in your State that will have an uninterrupted climb profile from take-off to the top of climb in 2018?	
5	How many airports with PBN SIDs currently operate in your State and how many do you estimate will do so in 2018?	
6	What is the estimated percentage of yearly traffic movements that currently fly on the published PBN SIDs and what is the estimated number to do so in 2018?	
7	For what reason were PBN departure routes implemented (e.g. reduced track miles/increase capacity/reduce population exposed to noise)?	

This questionnaire can be completed online at <https://portal.icao.int/surveys/En/Lists/QuestionnaireASBU/overview.aspx> or sent in hard copy to:

International Civil Aviation Organization (ICAO)  
 Air Transport Bureau  
 999 University Street  
 Montréal, Quebec  
 H3C 5H7  
 Canada  
 E-mail: [env@icao.int](mailto:env@icao.int)  
 Fax: +1 514-954-6744

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International  
Civil Aviation  
Organization

Organisation  
de l'aviation civile  
internationale

Organización  
de Aviación Civil  
Internacional

Международная  
организация  
гражданской  
авиации

منظمة الطيران  
المدني الدولي

国际民用  
航空组织

Ref.: AN 1/17 – 14/57

10 September 2014

**Subject:** International Civil Aviation Organization  
(ICAO) Committee on Aviation Environmental  
Protection (CAEP) Request for Data and Information

**Action required:** Submit completed questionnaires to  
ICAO by 31 December 2014

Sir/Madam,

Global demand for air travel is estimated to increase significantly in the future. While this growth will deliver global economic and social benefits, its negative impact on the environment from aircraft noise and emissions is to be minimized. In this regard, the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection (CAEP) is the body responsible for undertaking specific technical analyses related to control of aircraft noise and gaseous emissions from aircraft engines. The work of CAEP is undertaken by Working Groups, each tasked with a specific work programme related to a particular technical area, including aircraft noise, operations, aircraft engine emissions, modelling and data analysis, alternative fuels, and market-based measures.

The Working Groups rely on the cooperation of all ICAO Member States to provide the data and information required to accurately complete the studies and analyses with which they have been tasked. At the request of States, in order to reduce the burden of responding to multiple requests on the same topic, this letter includes a consolidated request for all information and data required by CAEP this year. Each attachment to this letter serves as a stand-alone request for information that can be provided to the appropriate departments within your Government.

I encourage your Government to submit to ICAO the data and information requested herein, no later than 31 December 2014.

Accept, Sir/Madam, the assurances of my highest consideration.

Raymond Benjamin  
Secretary General

**Enclosures:**

- A — Questionnaire on Noise Certification of Unmanned Aircraft Systems (UAS)
- B — Questionnaire on Certification Fuel Availability and Composition of Commercial Fuel
- C — Request for radar information and data
- D — Request for alternative fuels information and data

**CAEP WORKING GROUP 1 – AIRCRAFT NOISE, TECHNICAL**

**QUESTIONNAIRE ON NOISE CERTIFICATION OF UNMANNED AIRCRAFT SYSTEMS (UAS)**

CAEP Working Group 1 - Aircraft Noise Technical (WG1) is tasked with keeping ICAO noise certification Standards (Annex 16 – *Environmental Protection*, Volume I – *Aircraft Noise* to the *Convention on International Civil Aviation*) up to date and effective, while ensuring that the certification procedures are as simple and inexpensive as possible.

CAEP WG1 has been tasked to review the status of Unmanned Aircraft Systems (UAS) and inform CAEP if there is a need for work on the noise certification of UAS. The first action by WG1 will be to make an inventory of the current status of rules and practices, and any experiences and plans States may have, with respect to UAS noise certification. This is the purpose of this questionnaire.

For the purpose s of this exercise, a UAS is defined as an aircraft and its associated elements which are operated with no pilot on board.

Question	Answer
<p><b>1) Annex 16, Volume I currently has no lower weight limits and is not limited to manned aircraft. Thus some Chapters therein may be applicable to some types of UAS. Does your State currently apply (or would apply if there was an application) the requirements of ICAO Annex 16, Volume I (or equivalent) for noise certification of UAS?</b></p>	
<p>If so, under what regulatory regime were they certified? (e.g. flight operations, design, airspace or airways usage, crew license, etc.)</p>	
<p><b>2) If your State does not apply Annex 16, Volume I, does your State apply any alternative requirements, guidance, procedures or policies for UAS with regard to the general purpose of noise management at the source or noise certification<sup>1</sup>?</b></p>	

<sup>1</sup> The purpose of noise certification is defined here as: "to ensure that the latest available noise reduction technology is incorporated into aircraft design demonstrated by procedures which are relevant to day to day operations, to ensure that noise reduction offered by technology is reflected in reductions around airports".

<p><b>3) If your State did apply noise management at the source or a certification scheme of any kind for UAS, what was your experience? (Please indicate problems, recommendations, lessons learned.)</b></p>	
<p><b>4) Did your State take into account specific operational features or particular uses (e.g. environmental monitoring, firefighting, etc.), how UAS are operated, and/or any operating restrictions applicable when establishing the noise management at source or certification scheme?</b></p>	
<p><b>5) Does your State issue noise certificates for UAS? Is your State interested in issuing noise certificates for UAS?</b></p>	
<p><b>6) Do you consider UAS a noise problem in your State? Please describe your State's experience.</b></p>	
<p>Does your State have any plans to introduce or remove (specific) noise management at source or certification schemes for UAS?</p>	
<p>If your State is considering the introduction of schemes, please share details or the main characteristics of these schemes with ICAO (e.g. applicability, procedures, metric, regulatory limit values).</p>	

<b>7) Do you foresee any problems in the future linked to noise of UAS in your State? Please explain.</b>	
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This questionnaire can be completed online at <https://portal.icao.int/surveys/En/Lists/QuestionnaireWG1/overview.aspx> or sent in hard copy to:

International Civil Aviation Organization (ICAO)  
Air Transport Bureau  
999 University Street  
Montréal, Quebec  
H3C 5H7  
Canada  
E-mail: [env@icao.int](mailto:env@icao.int)  
Fax: +1 514-954-6744

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**CAEP WORKING GROUP 3 – EMISSIONS TECHNICAL**

**QUESTIONNAIRE ON CERTIFICATION FUEL AVAILABILITY AND  
COMPOSITION OF COMMERCIAL FUEL**

CAEP Working Group 3 – Emissions Technical (WG3) is tasked with keeping ICAO emissions certification Standards (Annex 16 – *Environmental Protection*, Volume II – *Aircraft Engine Emissions* to the *Convention on International Civil Aviation*) up to date and effective, while ensuring that the certification procedures are as simple and inexpensive as possible.

CAEP WG3 has been tasked with monitoring trends in aviation kerosene fuel supply composition and assess the consequences for emissions. The purpose of this questionnaire is to collate fuel composition data to help progress this task.

**1. Certification fuel availability**

The fuel specification bodies establish limits on the properties of the fuels for commercial use so that aircraft are safe and environmentally acceptable in operation. For engine emissions certification, the fuel specification is regulated for fuel properties with more stringent limits (Annex 16 – *Environmental Protection*, Volume II – *Aircraft Engine Emissions*, Appendix 4 refers). For example, the certification fuel specifications in Annex 16, Volume II set a minimum 1 per cent volume of naphthalene content and a maximum content of 3 per cent. It has been highlighted by the aerospace manufacturing community that it is challenging to source fuels for certification emission testing that meet this requirement. This raises the wider question on the availability of fuels compliant with the requirements of Annex 16 for fuel emissions testing.

Where information is available, please provide data on the composition of fuels available for emissions testing by completing Table 1. This information could be available from aircraft engine manufacturers or aviation fuel suppliers.

**2. Composition of commercial fuel uplifted**

ICAO continues to monitor trends in aviation kerosene fuel supply composition and assesses the potential consequences on engine emissions. This includes a global survey of fuel sulphur content to support the estimation of global and regional Sulphur Oxide gasses (SOx) emissions.

Where information is available, please provide data on the composition of commercial fuel uplifted for aircraft operations by completing Table 1. This information could be available from aircraft operators or aviation fuel suppliers.

**Table 1: Used to record (1) certification fuel availability and (2) composition of commercial fuel uplifted**

	(1) Certification fuel availability	(2) Composition of commercial fuel uplifted
Volume of Fuel (litres)		
<b><i>Fuel Property</i></b>	<b><i>Property Value</i></b>	<b><i>Property Value</i></b>
Density kg/m <sup>3</sup> at 15°C		
Distillation temperature, °C		
10% boiling point		
Final boiling point		
Net heat of combustion, MJ/kg		
Aromatics, volume %		
Naphthalenes, volume %		
Smoke point, mm		
Hydrogen, mass %		
Sulphur, mass %		
Kinematic viscosity at -20°C, mm <sup>2</sup> /s		

This questionnaire can be completed online at <https://portal.icao.int/surveys/En/Lists/QuestionnaireWG3/overview.aspx> or sent in hard copy to:

International Civil Aviation Organization (ICAO)  
 Air Transport Bureau  
 999 University Street  
 Montréal, Quebec  
 H3C 5H7  
 Canada  
 E-mail: [env@icao.int](mailto:env@icao.int)  
 Fax: +1 514-954-6744

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**CAEP MODELLING AND DATABASES GROUP (MDG)**

**REQUEST FOR RADAR INFORMATION AND DATA**

ICAO Member States and international organizations make models available to ICAO/CAEP to support its work programme to achieve greenhouse gas (GHG) emissions reductions. Analytical models used to support the ICAO/CAEP modelling needs provide annual fuel burn and emissions inventories, and as well, create future projections of fuel burn and emissions, providing transparency in the data used to inform decisions. The current and future scenarios are then compared against future goals to identify gaps, thus enabling improvements in identifying and prioritizing the mitigation solutions that could be pursued (e.g. technology, operations, alternative fuels, market-based measures as gap fillers, etc.). As aircraft and fuels technology evolves and operational patterns change, the intention is to use this improved knowledge base to refine mitigation solutions to achieve maximum benefit and avoid or minimize negative and unintended consequences.

With regard to the current level of radar data geographic coverage, major gaps exist and additional radar-based operations data is necessary to enhance modelling and analysis efforts within ICAO/CAEP to support the development of a global market-based measure for aviation, as well as other efforts.

The following States/regions provide approximately 75 to 80 per cent global coverage based on 2010 data:

- a) Argentina
- b) Australia – (Pending final agreement)
- c) Brazil
- d) Europe – Source: EUROCONTROL
- e) North and Central America – Source: U.S. Federal Aviation Administration (FAA)

Major gaps in coverage exist in Asia, Africa and the Middle East. Although these regions account for approximately 20 to 25 per cent coverage in 2010, their operational share will increase disproportionately in future years. There are ways of filling these data gaps through the use of commercially available data, but additional radar data would enhance and refine analytical capabilities.

In order to improve modelling and analysis capabilities to better understand the environmental impact of international aviation, including climate impacts, it would be helpful for the radar data to include those regions identified with gaps in raw radar-based operational data. Modelling and analysis efforts to support the development of a proposal for a global market-based measure for aviation, as well as other efforts, can be enhanced with increased radar-based operational data.

**The data requested for FLIGHTS includes:** The unique flight identifier (internal identifier used to link to position data), the departure airport (preferably ICAO code), the arrival airport (preferably ICAO code), the departure time (Coordinated Universal Time (UTC)) and arrival time (UTC), the carrier flight

number (or this and the above combined (e.g. BAW506), tail number/registration, and finally the ICAO service type (S, N, G, M, X) cargo indicator.

**The data requested for POSITIONS includes:** The unique flight identifier (link to flight level data), the sequence number (i.e. flight level position ordering), the position time (UTC), the latitude and longitude position, the altitude (hundreds of feet), and finally the position speed (knots).

In order to facilitate the integration of the data provided, please provide a file or series of files containing the data requested, with the fields in the same order as either a comma separated text file (CSV) or extensible markup language (XML) file. Since the data sets are likely to be large, it is preferable to send the data on DVDs or on a USB hard drive by post to the address below.

Alternatively, instructions for securely uploading the data to ICAO are available at: <https://portal.icao.int/surveys/En/Lists/QuestionnaireMDG/overview.aspx>.

International Civil Aviation Organization (ICAO)  
Air Transport Bureau  
999 University Street  
Montréal, Quebec  
H3C 5H7  
Canada  
E-mail: [env@icao.int](mailto:env@icao.int)  
Fax: +1 514-954-6744

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**CAEP ALTERNATIVE FUELS TASK FORCE (AFTF)**

**REQUEST FOR ALTERNATIVE FUELS INFORMATION AND DATA**

The CAEP Alternative Fuels Task Force (AFTF) is mandated to assess the potential range of emissions reductions from the use of alternative fuels in aviation up to 2050.

The AFTF has developed a methodology to carry out the assessment, which considers a combination of approaches to develop projections for the near, medium and long term. For the short term, the projection will use announcements from industry and States regarding plans and targets for alternative jet fuels production.

States are invited to provide the information listed in the following table.

For the purposes of this questionnaire, alternative jet fuels are defined as all jet fuels that are produced from sources other than petroleum. This includes synthetic fuel made from coal, gas, biomass or waste.

Question	Answer
<b>1) Has your State defined a target for alternative fuel in aviation?</b>	Yes/No
If yes, please provide the targets (million metric tons per year) and corresponding year.	
Is the target defined for production or for use?	
Is the target for commercial aviation or for all types of aviation (including military)?	
In this target, what is the estimated share of the feedstock that could be produced nationally?	
<b>2) Has your State defined a blending mandate for alternative fuel in aviation?</b>	Yes/No
If yes, please provide the mandatory blending ratio (percentage).	
Is the mandate for commercial aviation or for all types of aviation (including military)?	
<b>3) Has your State defined an incentive policy for the use of alternative fuels in aviation?</b>	Yes/No
If yes, what are the incentives for alternative fuel use in aviation?	

<b>4) Has your State initiated a national plan for the development/deployment of alternative fuels in aviation</b> (including initiatives to develop national value chains, feedstock production or processing facilities)?	Yes/No
If yes, please list the initiatives with their purpose (feedstock production/processing facility/entire value chain) and the expected production (thousands metric tons per year of alternative jet fuels).	
What is the range of feedstock considered for deployment?	
What is the range of processes considered for deployment?	
For conversion facilities, what is the share of the feedstock that is to be sourced from domestic resources?	
<b>5) Does your State have a projection related to the national future production of alternative fuels?</b>	Yes/No
If yes, please provide the volume of fuel expected and the corresponding year (thousands metric tons per year of alternative jet fuels).	
What is the range of feedstock considered for deployment?	
What is the range of processes considered for deployment?	
In this projection, what is the estimated share of the feedstock that could be produced nationally?	

This questionnaire can be completed online at <https://portal.icao.int/surveys/En/Lists/QuestionnaireAFTF/overview.aspx> or sent in hard copy to:

International Civil Aviation Organization (ICAO)  
 Air Transport Bureau  
 999 University Street  
 Montréal, Quebec  
 H3C 5H7  
 Canada  
 E-mail: [env@icao.int](mailto:env@icao.int)  
 Fax: +1 514-954-6744

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**APPENDIX 3A**



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**THE MIDDLE EAST AIR NAVIGATION PLANNING  
AND IMPLEMENTATION REGIONAL GROUP  
(MIDANPIRG)**

**FIRST MID REGION AIR NAVIGATION  
ENVIRONMENTAL REPORT**

*(December 2013)*

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontier or boundaries.

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## INTRODUCTION

### 1. BACKGROUND

1.1 The 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 improve efficiency of the ATM System.

1.2 Implementation of operational improvements will generally have benefits in areas such as improved airport and airspace capacity, shorter cruise, climb and descend times through the use of more optimized routes and an increase of unimpeded taxi times. These improvements have the potential to reduce fuel burn and lower levels of pollutants.

1.3 Environmental Protection represents one of the ICAO strategic objectives. It was highlighted in this respect that ICAO is introducing regional 'Performance Dashboard' homepages for every public website of the ICAO Regional Offices. These dashboards will illustrate the regional implementation status relating to the strategic objectives on Safety, Air Navigation Capacity and Efficiency, and Environmental Protection. The first Air Navigation Report is expected to be released in March 2014.

1.4 The 38<sup>th</sup> Session of the ICAO Assembly resolved through Resolution A38-18 (bullet 5) that States and relevant organizations will work through ICAO to achieve a global annual average fuel efficiency improvement of 2 per cent until 2020 and an aspirational global fuel efficiency improvement rate of 2 per cent per annum from 2021 to 2050, calculated on the basis of volume of fuel used per revenue tonnes kilometre performed.

### 2. ICAO FUEL SAVINGS ESTIMATION TOOL (IFSET)

2.1 The ICAO Fuel Savings Estimation Tool (IFSET) was developed to assist States to estimate and report fuel savings consistently with the models approved by ICAO's Committee on Aviation Environmental Protection (CAEP) and aligned with the Global Air Navigation Plan.

2.2 The IFSET, as well as instructions on its use, can be accessed at: <http://www.icao.int/environmental-protection/Pages/Tools.aspx>.

2.3 It is to be highlighted that what is required is an **estimation** of the environmental benefits accrued from **implemented** operational improvements and not the determination of the exact amount of fuel saving or CO<sub>2</sub> emission, which would require more advanced model/tool to capture all the operational elements needed to calculate the environment benefits.

2.4 MIDANPIRG mandated the reporting of the operational improvements in the MID Region through MIDANPIRG/13 Conclusion 13/35, as follows:

*CONCLUSION 13/35: ESTIMATING ENVIRONMENT BENEFITS*

*That, in order to allow the Air Traffic Management Measurement Task Force (ATMM TF) and the CNS/ATM/IC SG to follow-up the implementation of the ATM operational improvements and estimate the fuel savings accrued from the corresponding improvements on regional basis:*



- a) *States be urged to:*
  - i) *use IFSET or a more advanced model/measurement capability available to estimate environment benefits accrued from operational improvements;*
  - ii) *send the IFSET reports/the accrued environmental benefits to ICAO MID Regional office on a bi-annual basis.*
- b) *IATA to:*
  - i) *encourage users to support the programme; and*
  - ii) *consolidate users' inputs and report the accrued environmental benefits to ICAO MID Regional Office on a bi-annual basis.*

2.5 The first meeting of Air Traffic Management-Measurement Task force (ATMM TF/1) held at the ICAO Middle East Regional Office in Cairo, Egypt, 8-9 September 2013 agreed that the operational improvements be reported in three Parts as follows:

- a) 2009-2011 just a listing of the operational improvements which have been implemented during this period and which had environmental benefits, as at **Part I, Table I-1**;
- b) 2012-2013: period used for the generation of the first regional IFSET report as at **Part II, Table II-1** and **Table II-2**; and
- c) 2014 and beyond listing of planned operational improvements which will have environmental benefits, as at **Part III, Table III-1**.

2.6 This Report has been prepared based on the inputs received from Bahrain, Egypt, Jordan, Lebanon, Kuwait, Saudi Arabia and UAE.

**PART I – LIST OF OPERATIONAL IMPROVEMENTS IMPLEMENTED DURING YEAR 2009-2011**

**TABLE I-1: IMPLEMENTED OPERATIONAL IMPROVEMENTS 2009-2011**

State	Implemented Operational Improvements 2009-2011	Remarks
Bahrain	<ol style="list-style-type: none"> <li>1- New Eastern Apron established for 9 code E aircraft or 19 code C. This apron Ramp services are all underground such as APU etc.</li> <li>2- Reducing the final approach separation to 3NM, due to newly established rapid. TWY D.</li> <li>3- Using EUROCAT system.</li> <li>4- New ATS &amp; NOTAM Management System Installed and operational.</li> <li>5- eAIP is available on Web.</li> <li>6- Full Airport aeronautical Survey was done up to annex 15 Ch 10 requirements.</li> <li>7- ISO 9001:2008 certified.</li> <li>8- New VISALA automatic weather observation system (Aerodrome station).</li> <li>9- New weather radar system.</li> <li>10- Climate database upgrade CLDB.</li> <li>11- Terminal area forecast TAF verification.</li> <li>12- New messages switch (Moving Weather).</li> <li>13- Competency Assessment System for Aeronautical Meteorological Personnel (CAS).</li> <li>14- Radar winds and temperature profiler system.</li> <li>15- First weather radar link interface between Bahrain and UAE.</li> <li>16- New VISALA automatic weather observation system Backup (Aerodrome station).</li> </ol>	
Egypt	<ol style="list-style-type: none"> <li>1- Ban of air traffic over Sidi Krair and P18 &amp; P19 is cancelled</li> <li>2- Ban of air traffic over Ras El Hekma P20 is cancelled.</li> <li>3- Ban of air traffic between FYM &amp; CVO via R778 is partially suspended.</li> <li>4- Restrictions regarding landing on 05L and departure on 23R are cancelled</li> <li>5- Establishing route Q680 between DBA &amp; SALUN</li> <li>6- Traffic between Cairo and Arish via V602-ISM-V606 is permitted.</li> <li>7- Establishing route L315 between CVO &amp; HGD</li> </ol>	
Iran		
Iraq	<ol style="list-style-type: none"> <li>1- RVSM Implementation</li> <li>2- implementation of ATS route UP975 to increase the traffic flow capacity from Turkey to the Gulf through Baghdad FIR.</li> </ol>	
Jordan	<ol style="list-style-type: none"> <li>1- METSA- MAZAR-ZELAF (UM690)</li> <li>2- GRY-BUSRA-DAM (G662)</li> <li>3- ZELAF DCT QAA (A412)</li> <li>4- GRY DCT QAA (UN318)</li> </ol>	

Kuwait	SIDs and STARs implementation	
Lebanon	RNAV STARs implementation	
Libya	New ATS Routes Implemented	
Oman		
Qatar		
Saudi Arabia		
Sudan		
Syria		
UAE	RNAV1/5 SID/STARs, PBN routes	
Yemen		

**PART II - OPERATIONAL IMPROVEMENTS IMPLEMENTED DURING YEAR 2012-2013**

**Table II-1: Identified Operational Improvements 2012-2013**

<b>State</b>	<b>Identified Operational Improvements 2012-2013</b>	<b>Nr. of Movements Per Month</b>	<b>Total Fuel Saving Per Month</b>
<b>Bahrain</b>	UM677	3418	
	UP975	3802	
	UL602	1047	
	UL768	700	
	UP699	399	
	UN318	991	
	UP559	993	
<b>Egypt</b>	NABED-KATAB (T55)	1800	396000
	TBA-NWB-KITOT (UL550-N697) via Saudi Arabia	1170	330000
<b>Iran</b>			
<b>Iraq</b>			
<b>Jordan</b>	End of 2013: Implementation of RNAV SIDs, STARs and Approach Procedures at OJAI, OJAM and OJAQ.	N/A	N/A
<b>Kuwait</b>	No Operational Improvement implemented		
<b>Lebanon</b>	No Operational Improvement implemented		
<b>Libya</b>			
<b>Oman</b>			

<b>Qatar</b>			
<b>Saudi Arabia</b>	UM449 ( )		
	UM318 ( )		
	UM863 ( )		
	UL564 ( )		
	UM430 (SALWA-HAS)		
	UL681 ( )		
	UP517 ( )		
	UL550 ( )		
	UB411 ( )		
	R652 ( )		
<b>Sudan</b>			
<b>Syria</b>			

<b>UAE</b>	L308	5343	
	P559	3720	
	M557	5865	
	N571	4448	
	P699	2340	
	N318	2389	
	L604 / N685	4041	
	L305	1049	
	Arrival Manager (AMAN) implemented (1 min flight time saved/arrival to OMDB)		
	RNP-AR STARS at Abu Dhabi and Al Bateen Airports		
<b>Yemen</b>			

**Table II-2: IFSET REPORT**

<b>BAHRAIN</b>												
<b>UM677</b>												
Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	3418	399	3019	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
136	Level	29000	29000	289								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
60	Level	35000	35000	289								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UM677</b>	0	0	0	0	0	0	14331200	12592400	<b>-1738800</b>	0	0	0
<b>UP975</b>												
Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	3802	554	3248	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
137	Level	29000	29000	159								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
61	Level	35000	35000	159								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UP975</b>	0	0	0	0	0	0	8770400	7741200	<b>-1029200</b>	0	0	0

**UL602**

Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	1047	382	665	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
138	Level	29000	29000	278								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
62	Level	35000	35000	278								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UL602</b>	0	0	0	0	0	0	4222800	3854400	<b>-368400</b>	0	0	0

**UL768**

Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	700	230	470	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
139	Level	29000	29000	312								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
63	Level	35000	35000	312								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UL768</b>	0	0	0	0	0	0	3168600	2876300	<b>-292300</b>	0	0	0

**UP699**

Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	399	99	300	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
140	Level	29000	29000	178								
ID	Action	Frm_Alt	To_Alt	ASL	Time							



64	Level	35000	35000	178								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UP699</b>	0	0	0	0	0	0	1030400	924000	<b>-106400</b>	0	0	0
<b>UN318</b>												
Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	991	36	955	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
141	Level	29000	29000	403								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
65	Level	35000	35000	403								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UN318</b>	0	0	0	0	0	0	5794200	5027200	<b>-767000</b>	0	0	0
<b>UP559</b>												
Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	993	11	983	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
142	Level	29000	29000	426								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
66	Level	35000	35000	426								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>UP559</b>	0	0	0	0	0	0	6137200	5308900	<b>-828300</b>	0	0	0
<b>EGYPT</b>												

**NADEB-KATAB (T55)**

Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Single Aisle Jet	1800	150	1650	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
143	Level	24000	24000	245								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
67	Level	28000	28000	212								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>NADEB-KATAB (T55)</b>	0	0	0	0	0	0	3187200	2490000	<b>-697200</b>	0	0	0

**TBA-NWB-KITOT (IL550-N697)**

Aircraft	Baseline Ops	MidProc ops	NewProc ops	ASL								
Twin Aisle Jet	1170	30	1140	3050								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
144	Level	33000	33000	62								
ID	Action	Frm_Alt	To_Alt	ASL	Time							
68	Level	33000	33000	41								
Scenario	Old Climb Fuel in Kg	New Climb Fuel in Kg	Climb Savings in Kg	Old Descend Fuel in Kg	New Descend Fuel in Kg	Descend Savings in Kg	Old Level Fuel in Kg	New Level Fuel in Kg	Level Savings in Kg	Old Taxi Fuel in Kg	New Taxi Fuel in Kg	Taxi Savings in Kg
<b>TBA-NWB-KITOT (IL550-N697)</b>	0	0	0	0	0	0	949800	636400	<b>-313400</b>	0	0	0

**PART III – STATES’ PLANNED OPERATIONAL IMPROVEMENTS FOR YEAR 2014 AND BEYOND**

**TABLE III-1: PLANNED OPERATIONAL IMPROVEMENTS FOR YEAR 2014 AND BEYOND**

State	Planned Operational Improvements for year 2014 and beyond	Planned Year	Remarks
<b>Bahrain</b>	<ol style="list-style-type: none"> <li>1- RNAV1 SIDs and STARs.</li> <li>2- Introducing new RNAV1 AWYs with Kuwait FIR.</li> <li>3- Installation of Ground radar which will be used during CAT 2 operations and during LVP.</li> <li>4- We are planning for ASMGCS for the TWR to be used at the airport.</li> <li>5- DCL system in test.</li> <li>6- Upgrading ILS CAT 1 to CAT 2. This is under study.</li> <li>7- Special producer for A380 handling at Bahrain airport.</li> <li>8- IAPs will be reviewed and republish to reflect the new Airport Survey results.</li> <li>9- We are planning to open Clearance Delivery Position (CDP) at the TWR to release TWR GMC workload and frequency congestions.</li> <li>10- Also, planning to have ADM 270 degree simulator to train them on all emergencies and different abnormal situations to enhance the efficiency of our TWR operations.</li> <li>11- New automatic weather observation system three stationary and one portable station for Bahrain.</li> <li>12- Second weather radar link interface between Bahrain, UAE and Kuwait.</li> <li>13- Third weather radar link interface between Bahrain, UAE, Kuwait and Riyadh.</li> <li>14- Fourth weather radar link interface between Bahrain, UAE, Kuwait, Riyadh and Oman.</li> <li>15- Link common meteorological system with other GCC in order to enhance the cooperation (Integrated GCC automatic weather observation system).</li> </ol>	2014	
<b>Egypt</b>	PBN Implementation at HECA	2016	
<b>Iran</b>			
<b>Iraq</b>	SIDs, STARs and RNAV Approach at ORBI	2014	
<b>Jordan</b>	<ol style="list-style-type: none"> <li>1- Airway between METSA and MDB</li> <li>2- Airway between PASIP and METSA</li> <li>3- Airway between PASIP and METSA</li> <li>4- Expansion of GNSS</li> </ol>	2014	
<b>Kuwait</b>			

<b>Lebanon</b>	1- Planning for shorter RNAV SIDs and STARs 2- Direct routing between boundary points for over flight traffic.		
<b>Libya</b>	SIDs, STARs at HLLT	2014	
<b>Oman</b>			
<b>Qatar</b>			
<b>Saudi Arabia</b>			
<b>Sudan</b>			
<b>Syria</b>			
<b>UAE</b>	<ol style="list-style-type: none"> <li>1. Advanced AMAN/DMAN</li> <li>2. PRISMA system updates additional ATS Routes Civil/Military cooperation</li> <li>3. Seamless ANS provision throughout the UAE</li> <li>4. PBN route structure throughout the UAE</li> <li>5. Flight procedures optimised for CCO/CDO</li> <li>6. Airport infrastructure that maximises throughput and minimises congestion</li> <li>7. Interoperable ATM systems in the UAE</li> <li>8. Cost effective service provision.</li> <li>9. ANSP facilities accommodate the needed number of operational positions, support equipment, and personnel.</li> <li>10. ATM systems have sufficient capacity and functional capability to meet operational needs.</li> <li>11. Sufficient capacity without routine delays.</li> <li>12. Stakeholders are afforded a collaborative active role.</li> <li>13. Aviation policy development.</li> <li>14. Strategic planning. Tactical decision making.</li> <li>15. Routine and frequent communications among stakeholders, ANSP, and governmental organisations.</li> <li>16. Best Capable – Best Served during peak periods.</li> <li>17. Ground-Based Augmentation System (GBAS) for major airports</li> </ol>	2014/2030	
<b>Yemen</b>			

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**APPENDIX 3B**

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Planned/Implemented Operational Improvements  
Dated 10 November 2014

**Bahrain:**

- Single-Engine Taxi Operation: a new technique was adopted and made available for pilots to use which would considerably reduce the fuel consumption of an airline thus reducing the emission of CO<sub>2</sub>.
- As an attempt to expedite the flow of traffic, Bahrain has activated two approach radar sectors which would resolve conflict of traffic in peak time though minimizing delays.
- More efficient SID/STARS on RNAV1 basis is going to be implemented at BIA by the end of this year.
- Continuous Descent Operations (CDO) will be due for implementation by 2016.
- Continuous Climb Operations (CCO) will duly be implemented by 2016 along with CDO.
- New Shortest routes or enhanced ATS Route Structure is introduced to the aviation community as Contingency Routes which would consolidate a smoother traffic flow to Europe through Tehran. Such structure was implemented on 16 October 2014.
- Additional Flight Levels on some routes (RAGAS Eastbound traffic: due to the traffic from UAE to Tehran, RAGAS to be used for Westbound as well above FL300).
- Procedures to reduce unanticipated delays in flight or on ground (Automated Departure Clearance supported with digital text) and Ground Movement Radar.

**Jordan:**

- Deployment of a new ILS at OJAQ airport for runway 019 including the procedure design
- Revision and updating the LoA between Eilat airport and Aqaba App sector, the new LoA provided a new coordination scheme which has improved the flow of traffic between Aqaba and Eilat airport.
- New Voice communication system (VCS) was installed at Amman Radar simulator, the new upgraded VCS allow the Radar simulator to be used as alternative and backup for the existing RADAR operation room in case of emergency or unusual circumstances.

The following Operational Improvement are planned in 2015.

- Trail Continuous Descent Operations (CDOs).
- Trail Continuous Climb Operations (CCOs).

**Kuwait:**

- a new SSR was successfully implemented in August 2013.
- Work is underway for the development of an Advanced Surface Ground Movement system planned for 2015/2016.

- DGCA is also implementing a new ILS CAT 3b with associated NAV AIDS. Within this project new SID and Star procedures will be designed. This is expected in 2015/2016.
- Associated with the implementation of the new Air Traffic Management system will be a review and updating of the Operational Procedures and associated improvements in airspace usage.
- Continuous Descent Operations (CDO) will be due for implementation by 2016.
- Continuous Climb Operations (CCO) will duly be implemented by 2016 along with CDO.
- DGCA Kuwait has included within its ATM system a comprehensive billing and statistics system that will allow benchmarking on Core, Service Quality, cost efficiency and Environmental Key Performance Areas. This will be further tailored to meet additional KPA as required.

**Sudan:**

- Enhanced surveillance services through the implemented new Radars antennas and ADS-B stations which provided the opportunity for the provision of direct routing for the traffic operating within Khartoum FIR and will result in the reduction of longitudinal separation, planned for 2015.
- Implementation of RNAV SID and STARs, planned for December 2014.
- Implementation of CCO and CDO, planned for 2015.
- Implementation of Baro-VNAV approach procedures at the identified runway ends, planned for 2015.

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APPENDIX 3C

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**SINGLE ENGINE TAXI OPERATIONS AT BAHRAIN INTERNATIONAL AIRPORT**

1.1 Bahrain has adopted a procedure for single engine taxi at Bahrain International Airport, which will help in reducing CO<sub>2</sub> emissions in accordance with the provisions of the 38th ICAO General Assembly A37-19.

1.2 Aircraft must consume fuel to supply the energy needed to move its mass on the ground and such manoeuvre is called “taxiing”, where fuel consumption is directly involved in running the engines by which forward momentum is therefore produced. By logic sequence this action would relatively consume high fuel depending on the size and weight of aircraft, if we are to compare it with the environmental pollution contributing factor.

1.3 During the said phase an average consumption of fuel for A320 aircraft when taxiing on the ground is approximately 20 kg of fuel per minute and for B777 is approximately estimated to consume 40kg of fuel per minute.

1.4 Since Bahrain CAA has bounded its airspace with necessary measures which would greatly reduce the greenhouse gases and are detailed as follows:

- Implementation of RNAV 1 on all routes within the Bahrain airspace
- Activating two approach radar sectors to resolve possible traffic conflicts that may arise during the peak hours at the confluence of routes within the terminal area of the airport.
- Partial implementation of CDO and CCO within Bahrain FIR, where full implementation is expected to take place by end 2016.
- New Shortest routes or enhanced ATS Route Structure is introduced to the aviation community as Contingency Route Implementation Plan which would consolidate a smoother traffic flow to Europe from UAE FIR through Tehran FIR. Such structure was implemented on 16 October 2014.
- Restructuring the airspace with Tehran took place 16 October 2014 in such a way to accommodate more traffic thus relatively shortening the standard routes therein
- Procedures to reduce unanticipated delays in flight or on ground (Automated Departure Clearance supported with digital text) and Ground Movement Radar
- Availability of additional Flight Levels on some routes (RAGAS Eastbound traffic: due to the traffic from UAE to Tehran, RAGAS to be used for Westbound as well above FL300
- More efficient SID/STARS on RNAV1 basis is going to be implemented at BIA by the end of this year

1.5 However such achievement was only considered to be as a first stage of implementation, where the second upcoming stage was concerning the emission of burnt fuel of aircraft while on ground but was in pending mode then. The latter stage has preliminary laid a burden on the officials of BCAA and made the role of decision makers to come into play to seek for serious yet effective mitigation measures for reducing the gases being produced by aircraft on the ground. However, subject to certain directives, BCAA has conducted a survey for the unforeseen volume of gas emission in order to sense where BIA would stand from the pollution of aviation.

1.6 Surprisingly, the statistics have shown a stunning figure which revealed an average of nearly ninety departures compared to one hundred and thirty one arrivals using the international airport on daily basis, which implies that emissions may vary between 22,000kg for medium category two engines aircraft and 88,000kg for heavy four engines aircraft.

1.7 Accordingly, an initiative was yield by Bahrain CAA to reduce the total contribution to the environmental contamination as may be caused by the emission of CO<sub>2</sub>, in addition, to make a substantial savings of fuel in favour of an aircraft be it an airliner or a private.

1.8 In this very context, BCAA has adopted a technique and made it available for pilots to use should they wish to in order to consume less amount of fuel thus reducing engine emissions and that technique is expressed in taxiing with single engine provided the aircraft is of two engines or more. Such technique may well be used while an aircraft is taxiing in after landing and bound for parking or while an aircraft is taxiing out for departure. For the best interest of safety, certain governing conditions have been laid down in order to ensure that the technique is properly and fully used.

1.9 Those conditions have been published out as an AIP supplement which have adequately described the technique and the relevant conditions and shall be as follows:

- a) The technique may be exercised by the pilot without prior approval from ATC, so as to reduce the workload on the controller as well as the frequency, however, it has been stipulated that pilot should at least be familiar in a reasonable manner with aerodrome layout before commencing the technique.
- b) Taxi time should not be less than five minutes. This condition was stipulated in order not to keep the pilot unnecessarily busy in starting the other engine/s in times of shorter than five minutes which it may result in further delays to successive aircraft whilst the pilot is handful with other internal procedures and/or checklists.
- c) Pilots should adhere to ATC instructions anytime during the single engine taxi operations without any delay. This condition is concise and clear enough to speak for itself.
- d) Not to be exercised, if the reported visibility is less than 5km.
- e) Not to be exercised, in windy conditions, if the wind speed is more than 25kts and/or gust of more than 10kts. These two conditions are set by the regulatory directorate in order to ensure that safety measures are not infringed at any stage as an ensue to strong winds.
- f) Not to be exercised, if taxiing or parking will involve a turn of 180 degrees or more. This condition was stipulated for the sole sake of the aircraft type of two engines, where the pilot would switch one engine off and taxi with one only, and when it comes to turning at angle of 180 degrees or more, then the pilot would normally apply more engine power to compensate for other engine and that power increase should imperatively produce more engine blast which could wash away anything within the turn range.



- g) Not to be exercised, if the aircraft is on the runway or the pilot is requesting to cross the runway. This condition will render an assurance to the tower controller that a progressive taxi of aircraft will be maintained during either departing or arriving of an aircraft or while an aircraft is crossing the runway, in which case all engines have to be running in full numbers in order to ensure an expeditious vacation of the runway is carried out progressively.

1.10 Below is a copy of the Bahrain AIP SUP No 17/14 effective date 14 November 2014:

<b>BAHRAIN FIR</b> <b>AIR NAVIGATION DIRECTORATE</b> <b>AERONAUTICAL INFORMATION MANAGEMENT</b>		 وزارة المواصلات Ministry of Transportation
<b>AIP SUP 17/14</b>	<b>EFF Date 14 NOV 2014</b>	

RECORD AIP SUPPLEMENT IN GEN 0.3

**STATUS OF SUPPLEMENT ITEMS**

VALID SUPPLEMENTS: 03/02, 02/04, 05/12, 08/12, 21/13, 22/13, 23/13, 25/13, 01/14, 11/14, 13/14 AND 16/14

CANCELLED SUPPLEMENT: NIL

NOTAM CANCELLED BY THIS AIP SUPPLEMENT: NIL

**NR 17/14**  
**AD OBBI**

**Single Engine Taxi**

ICAO resolution A37-19 emphasizes the importance of the International Civil Aviation to limit or reduce the Carbon Dioxide emissions from aircraft within a state boundary. For this reason Bahrain has adopted a procedure which will help in reducing the emission of CO2 from aircraft and allow for airline fuel conservation. Single Engine Taxi Operations may be exercised by multi-engine aircraft provided the following conditions are met:

1. The pilot should be familiar with Bahrain International Airport in terms of aerodrome layout.
2. Taxing time expected to be 5 minutes or more
3. Pilot executing Single Engine Taxi Operation, should comply to ATC instructions as may be issued during taxiing without any delay.

In addition to the above, Single Engine Taxi Operations shall NOT be used if one of the following cases prevails:

1. Visibility conditions of less than 5KM.
2. Windy conditions (wind speed more than 25knots or gusts more than 10knots).
3. If taxi or parking will involve a turn of 180 degrees or more.
4. The aircraft is ON the active RWY OR requesting to cross the RWY.

- END -

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APPENDIX 4A

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**AIR TRAFFIC MANAGEMENT PERFORMANCE MEASUREMENT TASK FORCE**

**(APM TF)**

**1. TERMS OF REFERENCE**

**1.1 The Terms of Reference of the APM Task Force are:**

- a) develop the MID Regional Air Navigation environmental Reports based on the benefits accrued from operational improvements, using IFSET;
- b) provide regular progress reports to the ANSIG and MIDANPIRG concerning its work programme; and
- c) review periodically its Terms of Reference and propose amendments, as necessary.

**1.2 In order to meet the Terms of Reference, the APM Task Force shall:**

- a) follow-up the implementation of the ATM operational improvements required in the MID Air Navigation Strategy and Regional Air Navigation Plan (ANP) or in national plans and to place special emphasis on identifying and estimating the fuel savings accrued from the corresponding improvements;
- b) carry out permanent coordination with various MIDANPIRG contributory bodies in order to ensure appropriate integration of all tasks contributing to the estimation of environmental benefits related to the implementation of the ANP or national operational improvements;
- c) harmonize, at a regional level, the estimation of the environmental benefits from operational improvements in order to reach consistent results;
- d) collect and analyse the data related to the implemented operational improvements provided by States and users;
- e) use the IFSET to generate the MID Regional Air Navigation environmental Reports;
- f) develop proposals to keep and upgrade the ICAO Fuel Savings Estimation Tool (IFSET) as necessary; and
- g) keep under review the MID Region ATM performance objectives/priorities related to environmental benefits, and propose changes through the ANSIG, as appropriate.

**2. COMPOSITION**

**2.1 The Task Force is composed of:**

- a) MIDANPIRG Member States;
- b) concerned International and Regional Organizations as observers; and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

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