



*International Civil Aviation Organization*

**Air Traffic Management-Measurement Task Force**

**First Meeting (ATMM TF/1)**  
**(Cairo, Egypt, 8 –9 September 2013)**

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**Agenda Item 2: Estimation of Environmental benefits accrued from operational improvements**

**IDENTIFIED OPERATIONAL IMPROVEMENTS IN THE MID REGION**

*(Presented by the Secretariat)*

<p style="text-align: center;"><b>SUMMARY</b></p> <p>This paper identifies Operational Improvements in the MID Region that may be considered in the development of the MID Air Navigation Environmental Report.</p> <p>Action by the meeting is at paragraph 3.</p>
<p style="text-align: center;"><b>REFERENCES</b></p> <ul style="list-style-type: none"><li>- MID ATS Routes Catalogue</li><li>- MID Basic, ANP Table 1 ATS Routes</li><li>- MIDANPIRG/13 Report</li><li>- MSG/3 Report</li><li>- PBN/GNSS Report</li></ul>

**1. INTRODUCTION**

1.1 The MIDANPIRG/13 meeting was held in Abu Dhabi, UAE, from 22 to 26 April 2012. The meeting agreed that States/ANSPs in the MID Region start reporting the benefits as they plan or implement any type of operational improvement. The meeting further agreed that the results be sent to ICAO every six month using the IFSET tool.

1.2 The operational opportunities to reduce emissions represent a double win-win solution. First, based on the premise that the most effective way to minimize aviation emissions is to minimize the amount of fuel used in servicing and operating each flight, environmental benefits that are achieved through reduced fuel consumption also result in reduced fuel costs. Second, operational measures do not necessarily require the introduction of new equipment or the deployment of expensive technologies. Instead, they are based on different ways of operating aircraft that are already in service.

**2. DISCUSSION**

2.1 The meeting may wish to note that the third meeting of the MIDANPIRG Steering Group (MSG/3) agreed that the MID Air Navigation Environmental Report would be based on the environmental benefits accrued from identified operational improvements implemented after 2012.

2.2 It is to be highlighted that from 2010 till 2012 the ATS Route Network in the MID Region witnessed a significant enhancement with remarkable track distance saving, which could be considered as operational improvements. In this respect, the implementation of the following ATS Routes improved the efficiency in the MID Region: A/UA1, A/UA16, A/UA411, A/UA727, B/UB12, B/UB400, L/UL314, L/UL443, L/UL551, L602, L/UL681, UL768, M/UM425, M/UM449, M/UM691, M/UM860, M/U863, N/UN300, N/UN307, N/UN440, UP975, UR674, and R/UR799.

2.3 Likewise, the secretariat identified several ATS Route amendments implemented during 2012 and 2013, that may be considered as operational improvements. However, in order to decide which routes will be included in the MID Air Navigation Environmental Report, States and Users are invited to complete the table below:

a) ATS Routes amendments during the year 2012:

Operational Improvements (Identified Routes)			Old Scenario			Total Saving	
Route Designator or Segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Route(s) Designator or segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Distance saved	CO2
<b>2012</b>							
A/UA411 BNA-NASER- LOSUL-BRN	297						
L/UL308 EGNOV to LATEM							
L/UL430							
L/UL564							
L/UL604							
L/UL612							
L/UL677							
M/UM309							
M/UM318							
M/UM321							
M/UM872							
N/UN697							
R652							
M/UM434							
M/UM557							
P/UP699							

## b) ATS Routes amendments during the year 2013:

Operational Improvements (Identified Routes)			Old Scenario			Total Saving	
Route Designator or Segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Route(s) Designator or segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Distance saved	CO2
<b>2013</b>							
B/UB411 ROVAR-ASH	224NM		Via (L550)	Via (L550) 265NM			
G/UG462							
L/UL305							
L/UL308 RNAV 1 Bahrain		9456					
L/UL602 RNAV 1 Bahrain		10817					
L/UL604 RNAV 1 Bahrain		7013					
M/UM318							
M/UM430							
M/UM557 RNAV 1 Bahrain		10817					
M/UM600 RNAV 1 Bahrain		10817					
M/UM677 RNAV 1 Bahrain		9456					
N/UN318RNAV 1 Bahrain		4285					
N/UN563							
N/UN571 RNAV 1 Bahrain		7389					
N/UN563RNAV 1 Bahrain		7389					
N/UN685 RNAV 1 Bahrain		7013					
N/UN687							
N/UN768 RNAV 1 Bahrain		7389					
N/UN929 RNAV 1 Bahrain		4122					
P/UP559 RNAV 1 Bahrain		6323					
P/UP699 RNAV 1 Bahrain		4122					
P891							
R686							

2.4 Similarly, several SIDs, STARs and PBN projects were implemented in the MID Region during the past three years, and the following implementations could be considered as candidates for inclusion in the MID Air Navigation Environmental Report: SID/STAR and (or) PBN in Bahrain, Iraq, Jordan and UAE.

2.5 The Table below may be used by the meeting to evaluate the operational improvements reported by States and Users related to the SIDs, STARs and PBN implementations:

Operational Improvements (SIDs, STARs and Approach Procedures)			Old Scenario			Total Saving	
Designator	Distance of modified Segment(s)	Nr. of Mvts	Designator	Distance	Nr. of Mvts	Distance saved	CO2
<b>2012 - 2013</b>							

2.6 The meeting may wish to note the “Environmental Benefits” Report prepared by Egypt at **Appendix A** to this working paper, that might be used by MID States, as a sample for reporting the IFSET results and environmental benefits to the ICAO MID Regional Office. Below the report conclusion:

Operational Improvements (Identified Routes)			Old Scenario			Total Saving	
Route Designator or Segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Route(s) Designator or segments	Total Distance of ATS Route/ Segments	Nr. of Mvts	Distance saved	CO2
<b>Egypt</b>							
CVO-ISMLH-ARH (V602-V606)	141		CVO-BLT-MELDO-PASOS-ARH (A16-W850-G183)	284		143	
FYM-CVO (R778)	67		FYM-CVO (W8-W163)	90		23	
CVO-HGD (L315)	196		CVO-SEMRU-HGD (M872)	234		38	
NABED-KATAB (T55)	212		NABED- AST-KATAB (V608-P751)	245		33	
TBA-NWB-KITOT (UL550-N697) via Saudi Arabia	41 Check to destination		TBA-NWB-METSA (UL550-W733) via Jordan	62 Check to dest.		21	
SALUN-DBA-FYM (Q680-M872)	304		SALUN-BRN-KATAB-FYM (L604-P751-R778)	439		135	

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) agree on the operational improvements which will be used for the development of the First MID Air Navigation Environmental Report;
- b) estimate the fuel savings accrued from the corresponding improvements using the IFSET tool; and
- c) agree on the reporting period to be used for the development of the MID Air Navigation Environmental Reports.

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**NATIONAL AIR NAVIGATION SERVICES COMPANY**  
**NANSC – EGYPT**

**NANSC IFSET SEMI-ANNUAL REPORT**  
**Jan – June 2013**

**BY**

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**July 2013**

## CONTENTS

	Subject	Page
1	Introduction	3
2	Objective	3
3	Scope	3
4	Methodology	4
5	Cases	4 - 11
6	Conclusion	12

## **NANSC IFSET SEMI-ANNUAL REPORT**

**Jan – June 2013**

### **1. Introduction:**

As a result of series of meetings between a group of National Air Navigation Services Company NANSC officials and the Military officials for the object of enhancing the Air space capacity and efficiency of Cairo FIR, this report comes to focus on one of the most important objectives of these meetings outcomes. Where enhancing the route capacity and efficiency is resulting directly on fuel saving, this report is a semi-annual report declaring the fuel saving achieved as a result of the implementation of the ICAO Fuel Saving Estimation Tool IFSET before and after the improvements carried out by NANSC on the operational procedures.

### **2. Objective:**

This report is aiming at addressing the results derived from the application of ICAO Fuel Saving Estimation Tool IFSET to capture the difference in flight trajectory performance in terms of fuel consumption before and after the implementation of the operational improvements in Cairo FIR.

### **3. Scope:**

- a. The application of IFSET is limited to the air traffic landing, taking off within the Egyptian Airports and overflying Cairo FIR.
- b. The procedures to be evaluated are that developed during a 6 months period from the 1<sup>st</sup> of Jan. 2013 till the end of June 2013.
- c. Traffic analysis were limited to the level flights, while analysis of Climbing, Descending and Taxing of air traffic was postponed for the next report as it still under developments.
- d. Traffic flow for each route or portion of it or its capacity is not available.

#### 4. Methodology:

- e. **Traffic mix:** To define the traffic mix for the IFSET application, a statistical analysis of the traffic database has been done to sort out and classify the aircraft types and numbers during the period of the scope to statistically calculate a **base line ONE DAY traffic mix** or a **Control day** during this very period.
- f. **Virtual Flight level:** As the traffic sample is a mix of flights using different flight levels, it is assumed - for the purpose of IFSET application - **a virtual flight level FL 245** as a division level between Cairo upper FIR and lower FIR.
- g. **Traffic categories:** The type of aircraft where its traffic frequency is less than 50 movements during a week was deleted from calculation. Then, traffic was sorted and classified into categories according to aircraft categories mentioned in the IFSET database. The following table shows the results of the traffic classification during a control day during the period of the scope:

	Traffic Category	Number of traffic during a control day
1	Single Aisle Jet	654
2	Twin Aisle Jet	99
3	Large Twin Aisle Jet	59
4	Three Plus Engine Twin Aisle Jet	34
5	Turboprop	26
6	Large Single Aisle Jet	20
7	Regional Jet	14
	<b>Total</b>	<b>906</b>

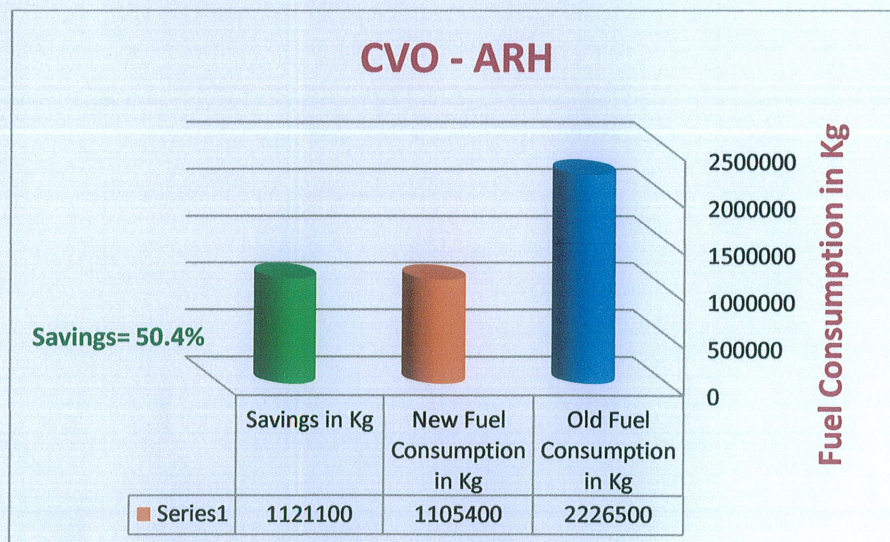
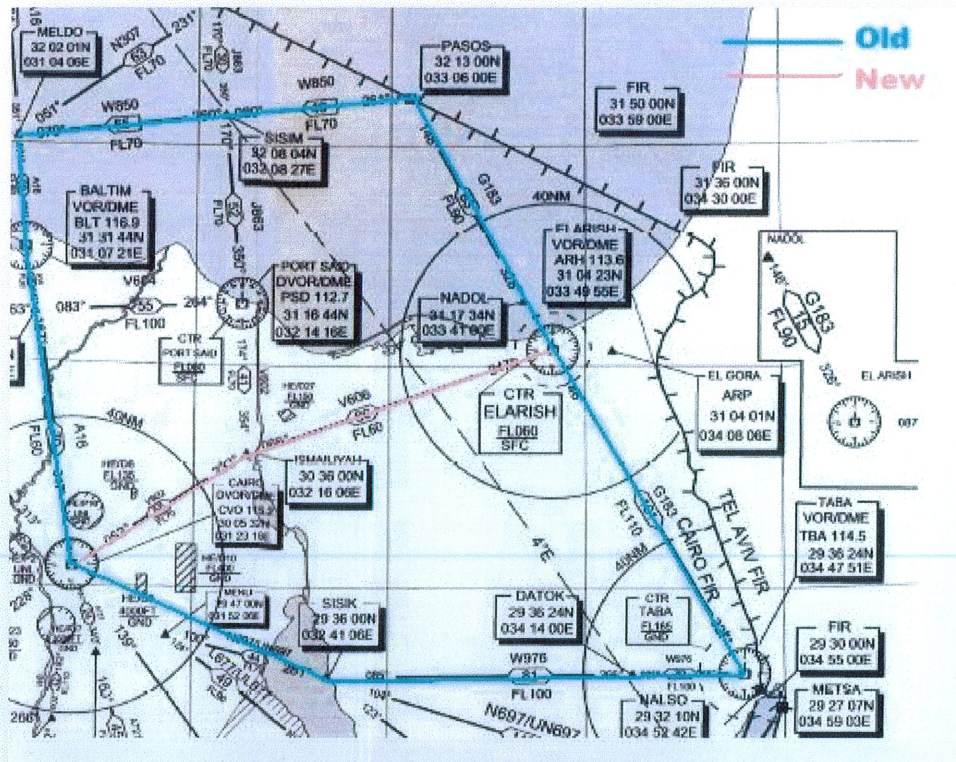
5. **Cases:** The following cases are that routes which are statistically examined by IFSET:

Case	Old procedures	Distance in NM	New procedures	Distance in NM	Distance saved in NM
1	CVO-BLT-MELDO-PASOS-ARH	284	CVO-ISM-ARH	141	143
2	DBA-NANVO-BRN	137	DBA-BRN	129	8
3	FYM-ALPID-CVO	90	FYM-CVO	67	23
4	CVO-SEMUR-HGD	234	CVO-HGD	196	38
5	NABED-AST-KATAB	245	NABED-KATAB	212	33
6	TBA-NWB-METSA	62	TBA-NWB-KITOT	41	21
7	SALUN-BRN-KATAB-FYM	439	SALUN-DBA-FYM	304	135

## Case 1

## Traffic from Cairo CVO/VOR to Arish ARH/VOR

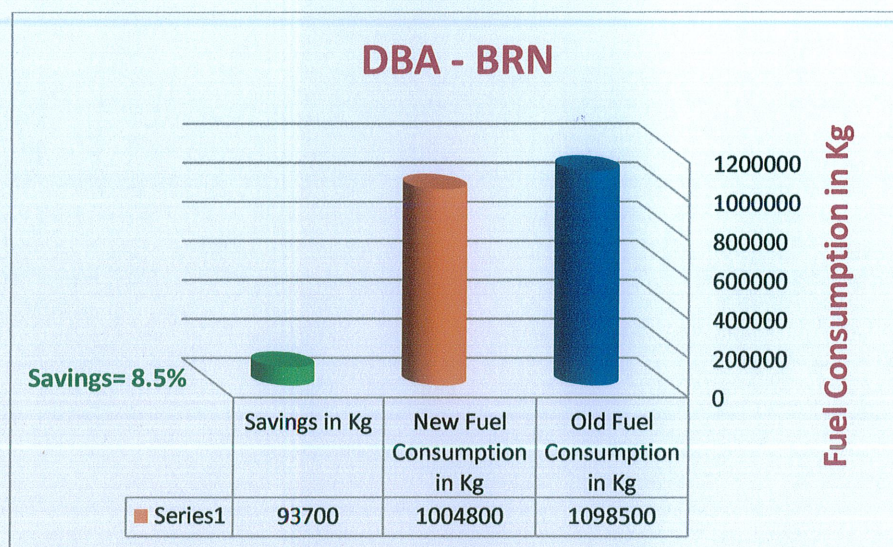
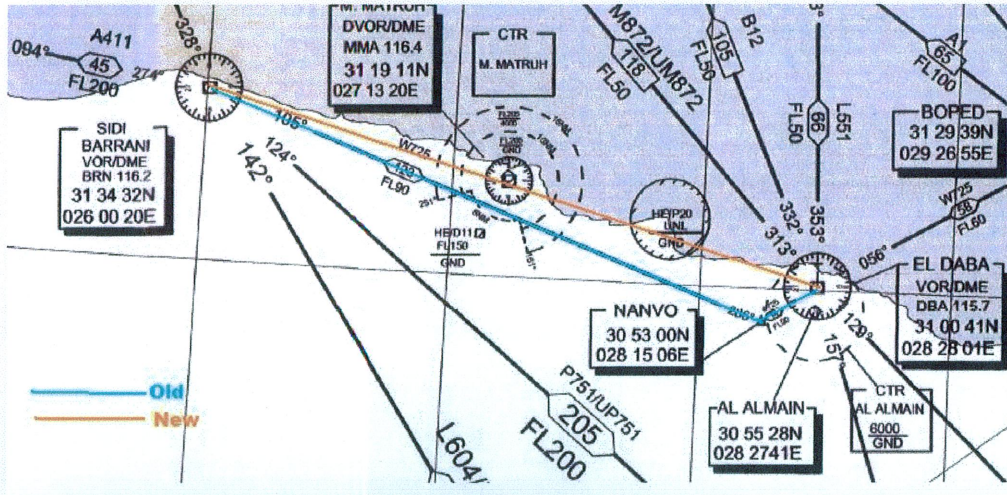
- **Old route:** CVO-BLT-MELDO-PASOS-ARH = 284 NM
- **New route:** CVO-ISM-ARH = 141 NM
- **Saved distance:** 143 NM



## Case 2

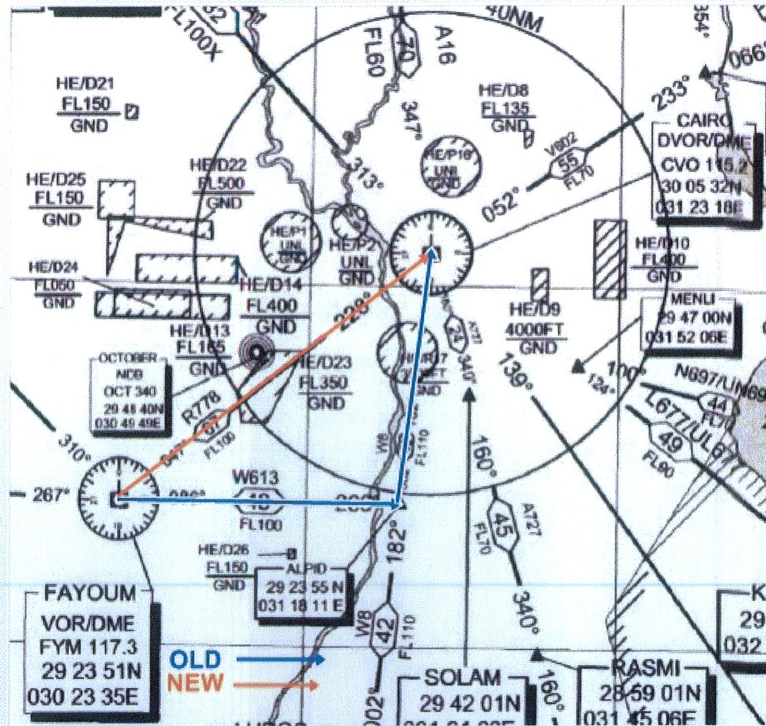
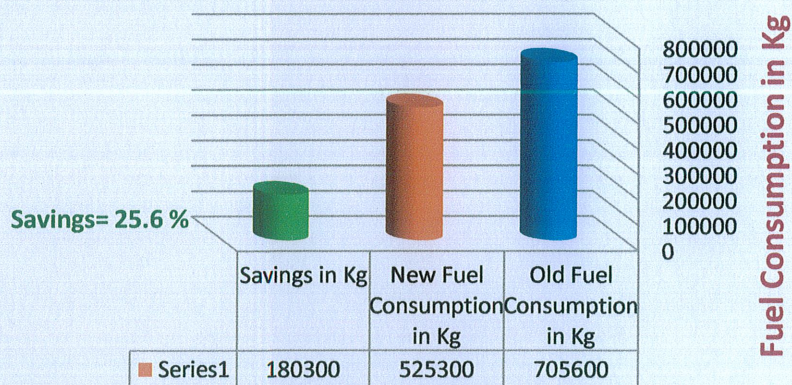
## Traffic from DBA/VOR to Sidi Barrani BRN/VOR

- **Old route:** DBA – NANVO - BRN = 137 NM
- **New route:** DBA - BRN = 129 NM
- **Saved distance:** 8 NM



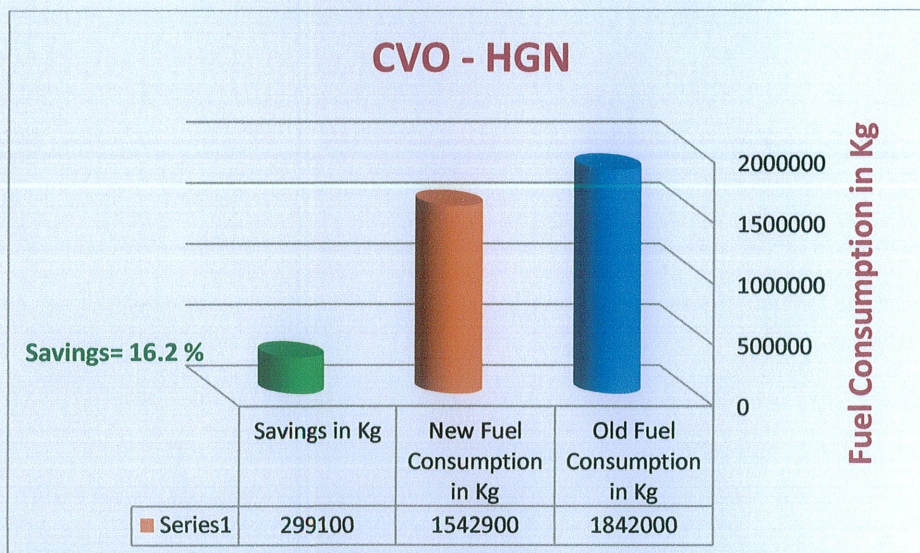
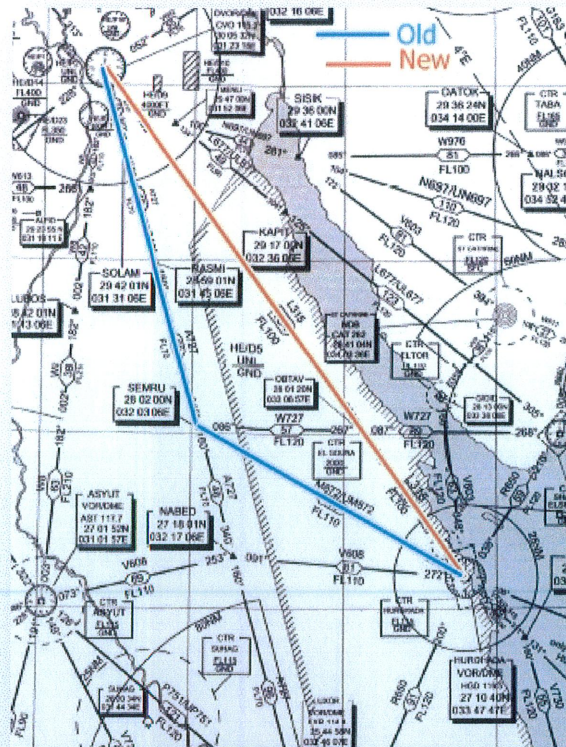
**Case 3****Traffic from FYM/VOR to Cairo CVO/VOR**

- **Old route:** FYM – ALPID – CVO = 90 NM
- **New route:** FYM - CVO = 67 NM
- **Saved distance:** 23 NM

**FYM - CVO**

**Case 4****Traffic from FYM/VOR to Cairo CVO/VOR**

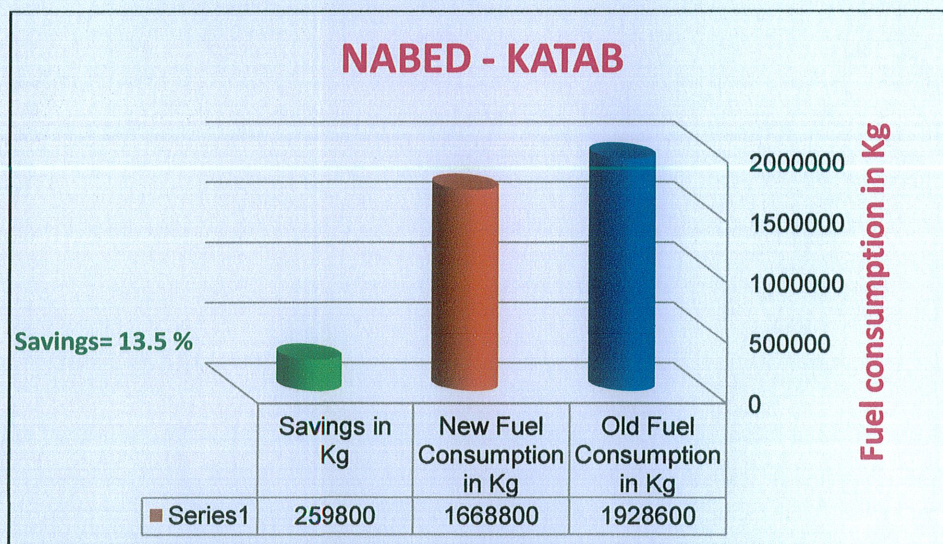
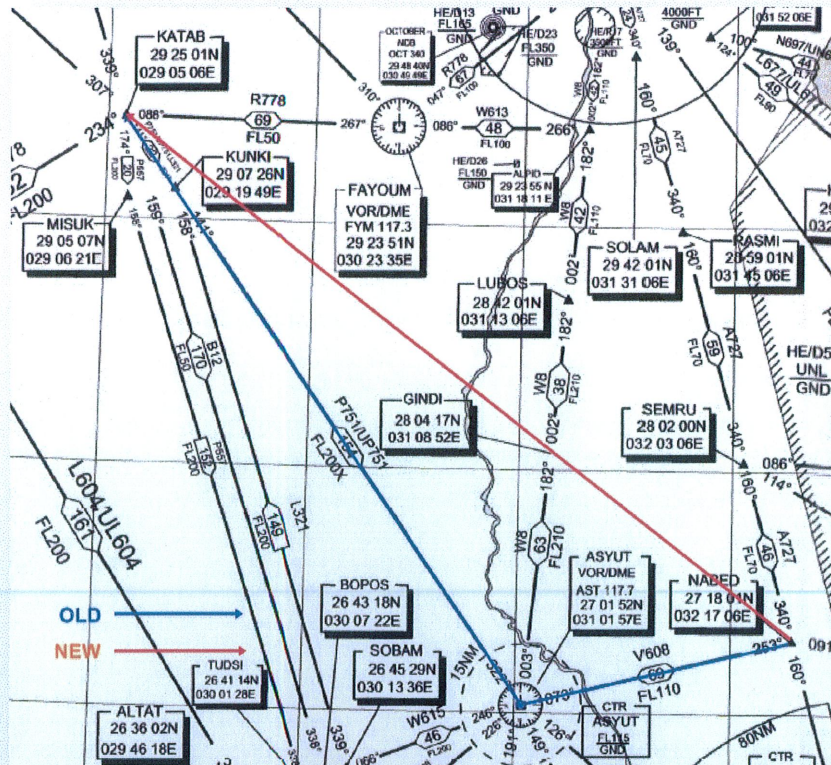
- **Old route:** CVO – SEMRU - HGD = 234 NM
- **New route:** CVO - HGD = 196 NM
- **Saved distance:** 38 NM



## Case 5

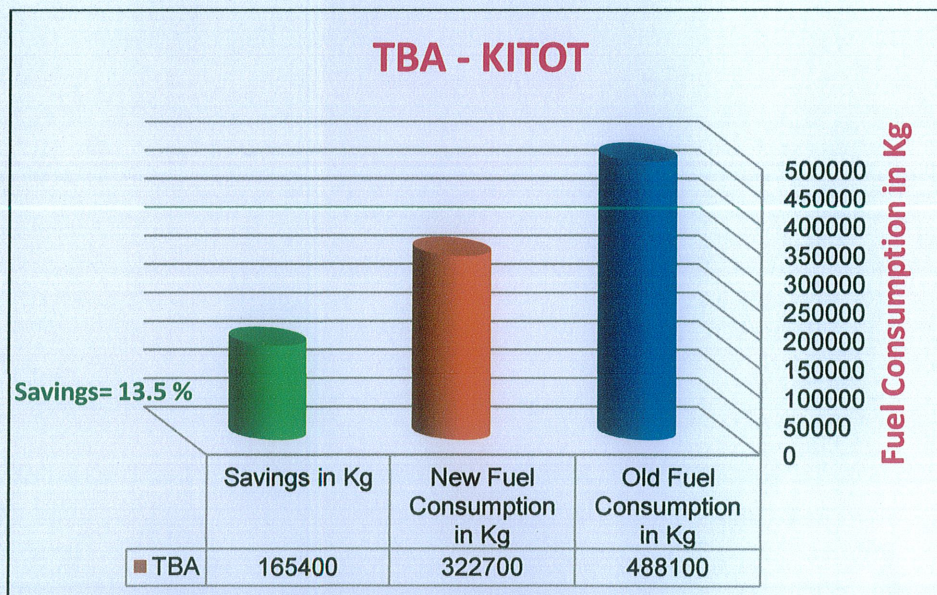
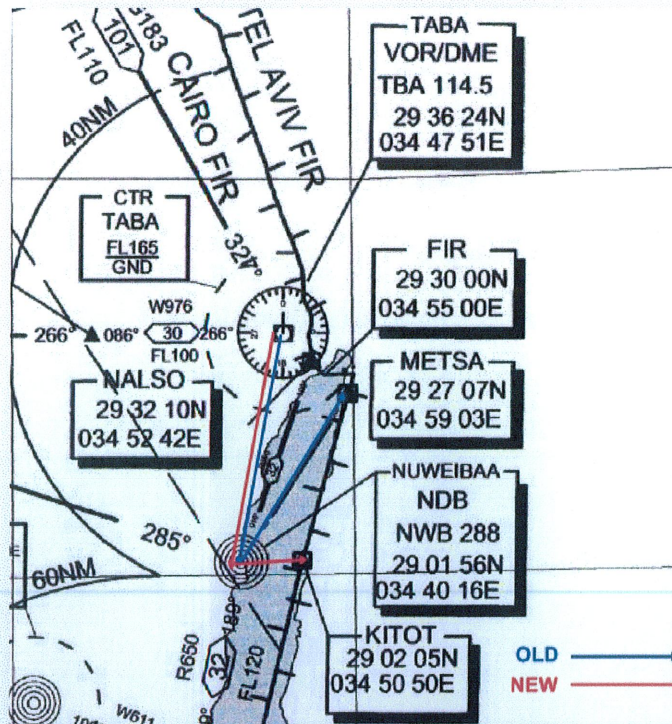
### Traffic from NABED to KATAB

- **Old route:** NABED – AST - KATAB = 245 NM
- **New route:** NABED - KATAB = 212 NM
- **Saved distance:** 33 NM



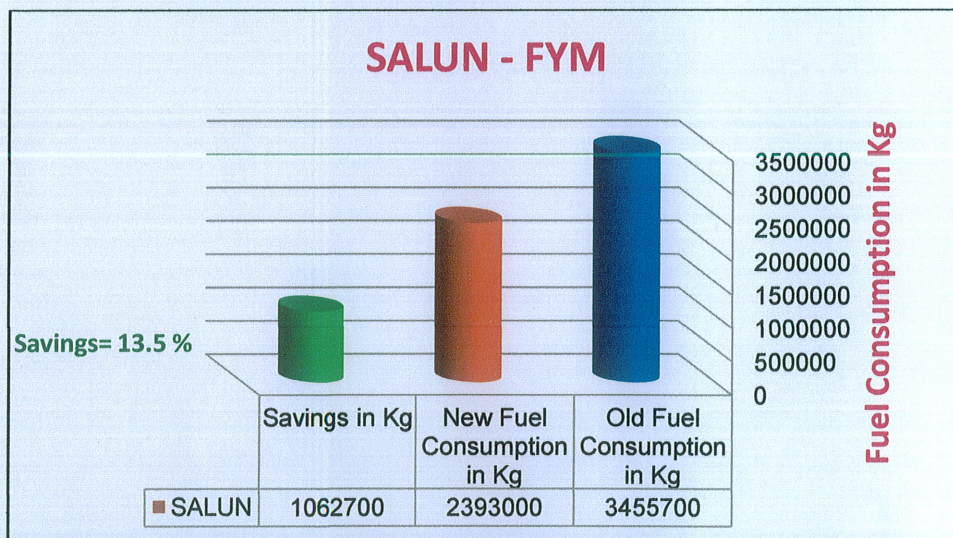
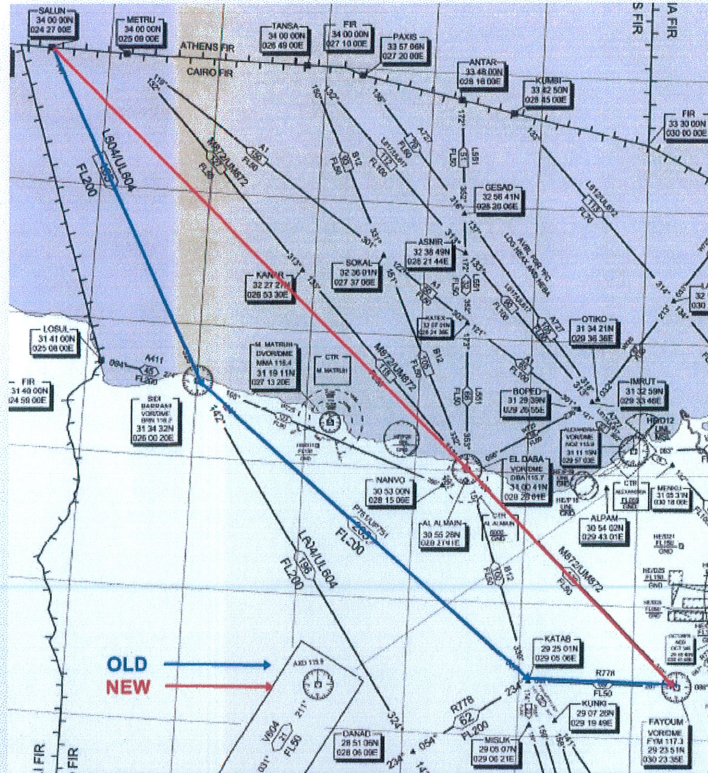
**Case 6****Traffic from Taba TBA/VOR to NWB/NDB**

- **Old route:** TABA – NWB – METSA = 62 NM
- **New route:** TABA – NWB – KITOT = 41 NM
- **Saved distance:** 21 NM



**Case 7****Traffic from SALUN to FYM/VOR**

- **Old route:** SALUN – BRN -KATAB - FYM = 439 NM
- **New route:** SALUN – DBA - FYM = 304 NM
- **Saved distance:** 135 NM



## 6. Conclusions:

Case	Old procedures	Distance in NM	New procedures	Distance in NM	Distance saved in NM	Old Fuel Consumption in Kg	New Fuel Consumption in Kg	Savings in Kg	Savings (%)
1	CVO-BLT-MELDO-PASOS-ARH	284	CVO-ISM-ARH	141	143	2226500	1105400	<b>1121100</b>	50.4%
2	DBA-NANVO-BRN	137	DBA-BRN	129	8	1098500	1004800	<b>93700</b>	8.5%
3	FYM-ALPID-CVO	90	FYM-CVO	67	23	705600	525300	<b>180300</b>	25.6%
4	CVO-SEMRU-HGD	234	CVO-HGD	196	38	1842000	1542900	<b>299100</b>	16.2%
5	NABED-AST-KATAB	245	NABED-KATAB	212	33	1928600	1668800	<b>259800</b>	13.5%
6	TBA-NWB-METSA	62	TBA-NWB-KITOT	41	21	488100	322700	<b>165400</b>	33.9%
7	SALUN-BRN-KATAB-FYM	439	SALUN-DBA-FYM	304	135	3455700	2393000	<b>1062700</b>	30.8%
		1491		1090	392				8.5 % up to 50.4%

- It is shown from the previous table that a total of 1491 NM of air routes has reduced to 1090 NM.
- This reduces 392 NM distance.
- The fuel saving in Kg is not an actual figure; it only reflects the calculation of the fuel consumed by the **traffic mix** flown between the points of each case on the **virtual flight level** during the **control day**.
- The fuel saving ratio varies according to the saved distance.
- The fuel saving varies between 8.5% up to 50.4% of the fuel consumption between the points of the new procedures in each case.

**NANSC – EGYPT**  
**JULY 2013**