SAT/14
WP/15
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INTERNATIONAL CIVIL AVIATION ORGANIZATION

FOURTEENTH MEETING ON THE IMPROVEMENT OF AIR TRAFFIC SERVICES OVER THE SOUTH ATLANTIC

Montevideo, Uruguay, 7 to 9 May 2008

Agenda Item 1: Air traffic management (ATM)

1.4. Follow up of the Implementation of UN741 and UN866 as unidirectional routes.

EXPECTED BENEFITS DERIVED FROM THE IMPLEMENTATION OF UN741 AND UN866 AS UNIDIRECTIONAL ROUTES

(Presented by Spain)

SUMMARY

This paper shows expected benefits, in terms of fuel and Co2 emissions reductions, obtained with the implementation of UN741 and UN866 as unidirectional routes.

1. INTRODUCTION

1.1 The implementation of UN741 Southbound and UN866 Northbound as unidirectional routes, using in both routes ODD and EVEN FL indistinctly, was adopted on February 2007 on SAT13/TF1 Meeting and implemented on 5th July 2007.

1.2 After nine months of experience with this new unidirectional system, all data about the new air traffic distribution and flight level allocation is available and, comparing this information with the previous bi-directional system, the benefits in terms of fuel savings and CO2 emissions reductions can be assessed in this study.

2. DISCUSSION

2.1 Needless to say, this task is undoubtedly difficult due to several reasons:

a) First of all, important variations in the traffic fluency over the EUR/SAM Corridor have taken place: occupancy's distribution per ATS route, increment of movements per year, etc.

b) Thus, it is highly difficult to find a number to represent the savings that the implementation has produced:

1. More FL availability and therefore better climb planning for operators.

2. Better possibilities to obtain from ATC the optimum flight level due to the lack of traffic in the opposite direction.

3. Less penalisation when the optimum flight level can not be cleared and therefore save in fuel consumption.

4. More ATC capacity due to a decrease in the controllers' workload.

5. Environmental benefits due to the decrease of fuel consumption.

3. HYPOTHESES

3.1 This analysis has been performed with following hypotheses:

3.1.1 Aircraft distribution in the EUR/SAM corridor for the period January 2007 to March 2008 has been:

MODEL AIRCRAFT	%
A34X	13.9%
A33X	13.4%
B74X	5.2%
B76X	5.1%
B77X	4.4%
A31X	3.6%
MD11	2.5%
B75X	0.3%
OTHER	1.5%

3.1.2 For this and to simplify the results, Airbus 340 has been selected as type aircraft to perform this study.

3.1.3 Every aircraft has an optimum altitude at which it can operate. Optimum altitude, is the altitude at which aircrafts can fly more nautical miles per 1000 kg of fuel:

a. A difference, in fuel consumption, of 3.6 kg/min between the optimal flight level and the nearer (2000 ft).

b. A difference, in fuel consumption, of 6.6 kg/min between the optimal flight level and a difference of 4000 ft. (Data obtained from the guidance material and best practices for fuel and environmental management – data of IATA).

3.1.4 The fuel price increased dramatically from the second half of 2007 and during 2008. Nevertheless, a price of $1.89 USD/GAL is the last available official information (data of IATA beginning of 2007).

3.1.5 Flight data are the ones collected in the statistic report published by SATMA.

3.1.6 In spite of the spectacular increase observed in the second half of 2007 and beginning of 2008, this study has been performed with a more conservative growth rate:

a. The normal case is a forecast from 2008 to 2015 with a 7 % increase per year.

b. The optimist case is a forecast from 2008 to 2015 with a 10% increase per year.

3.1.7 To asses the benefits obtained, the study of nautical miles flown at not optimal flight level presented in SAT13 has been updated with real data of the traffic flown since 5th July 2007:

a. First of all, two referenced days were selected: 13th April of 2007 and 28th September of 2007. Both days were Fridays, had the same number of movements (90) and traffic distribution per ATS route.

b. The flight level reference was obtained from original flight plans and radar information.

c. If the bi-directional configuration should be in force (compared with current structure):

- The penalisation of nautical miles flown at non optimal flight level should be more than 5000 nautical miles per day.

- This number of nautical miles flown at non optimal flight level should increase dramatically up to 2015.

- It wishes to emphasize that the implementation has affected in the distribution per ATS route with more impact on UN857.

4. RESULTS

4.1 The results obtained are clearly positives in terms of fuel consumptions:

FUEL SAVING ($ USD)	AVERAGE PER YEAR	2008	2015	2008-2015
NORMAL CASE (7%)	1,500,363	1,228,438	1,729,415	12,002,901
OPTIMIST CASE (10%)	2,028,952	1,572,719	2,321,298	16,231,614

4.2 The air community could reduce its CO2 emissions anticipating the new foreseen restrictions.

CO2 EMISSIONS SAVING (TON CO2)	AVERAGE PER YEAR	2008	2015	2008-2015
NORMAL CASE (7%)	5399	4800	8342	55022
OPTIMIST CASE (10%)	9826	5998	11310	73437

5. ACTION BY THE MEETING

5.1 The SAT/14 meeting is invited to:

a) Discuss the figures and hypothesis presented in this WP.

b) Evaluate the need to have continuous cost - benefit analysis in close coordination with IATA and air carriers.

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