



International Civil Aviation Organization

**The Twenty-Second Meeting of the APANPIRG ATM/AIS/SAR Sub-Group
(ATM/AIS/SAR/SG/22)**

Bangkok, Thailand, 25 – 29 June 2012

Agenda Item 3: Regional Performance Framework and Metrics

SAVING ON FUEL AND EMISSIONS ON ROUTE W20

(Presented by India)

SUMMARY

This paper presents the benefits in terms of fuel saving / CO2 savings on introduction of Reduced Spacing of 40 NM on route W20.

This paper relates to –

Strategic Objectives:

*C: Environmental Protection and Sustainable Development of Air Transport –
Foster harmonized and economically viable development of international civil
aviation that does not unduly harm the environment*

Global Plan Initiatives:

- GPI-5 RNAV and RNP (Performance-based navigation)
- GPI-6 Air traffic flow management
- GPI-7 Dynamic and flexible ATS route management
- GPI-8 Collaborative airspace design and management

1. INTRODUCTION

1.1 Under the initiatives for the reduction of carbon emissions and fuel saving, Airports Authority of India introduced reduced spacing of 40 NM on route W20, which is a busy domestic route from Delhi to Bangalore / Chennai. This route is intersected by major east-west international routes and the traffic on this route were not getting preferred levels due to crossing traffic and traffic congestion at same levels. The reduction in horizontal spacing from ten minutes to forty miles has resulted in the allocation of optimum cruising levels for more number of aircraft on this route.

2. DISCUSSION

2.1 The fuel savings were estimated per aircraft with the help of the IFSET tool under different scenario. The types of aircraft using this route were the B737, A319 and A32X families of aircraft. These aircraft prefer cruising levels from F330 – F390. The average distance for maintaining cruising level on route W20 from south of KALNA to before descent point (VABDI and HITAS) was taken as 500NM.

2.2 **Scenario W20-RS1:** Before introduction of Reduced Spacing aircraft had to fly F310 and the aircraft gets F370 after introduction of Reduced Spacing of 40 NM. The same was input in IFSET and the resultant fuel savings are:

Scenario	Old Fuel Consumption in Kg	New Fuel Consumption in Kg	Fuel Savings in Kg	Savings (%)	Carbon emission in Kg
W20-RS1	2800	2400	400	14.3	1264

2.3 **Scenario W20-RS2:** Before introduction of Reduced Spacing aircraft had to fly F330 and the aircraft gets F370 after introduction of Reduced Spacing of 40NM. The same was input in IFSET and the resultant fuel savings are:

Scenario	Old Fuel Consumption in Kg	New Fuel Consumption in Kg	Fuel Savings in Kg	Savings (%)	Carbon emission in Kg
W20-RS2	2700	2400	300	11.1	948

2.4 **Scenario W20-RS3:** Before introduction of Reduced Spacing aircraft had to fly F350 and the aircraft gets F390 after introduction of Reduced Spacing of 40 NM. The same was input in IFSET and the resultant fuel savings are:

Scenario	Old Fuel Consumption in Kg	New Fuel Consumption in Kg	Fuel Savings in Kg	Savings (%)	Carbon emission in Kg
W20-RS3	2500	2200	300	12.0	948

2.5 **Scenario W20-RS4:** Before introduction of Reduced Spacing aircraft had to fly F310 and the aircraft gets F330 after introduction of Reduced Spacing of 40 NM. The same was input in IFSET and the resultant fuel savings are:

Scenario	Old Fuel Consumption in Kg	New Fuel Consumption in Kg	Fuel Savings in Kg	Savings (%)	Carbon emission in Kg
W20-RS4	2800	2700	100	10.7	316

2.6 The above calculations demonstrate that the fuel savings for the above family of aircraft is above 10% and for two thousand feet of change 316 Kg of carbon-dioxide emissions are saved. This savings multiply on an average for every additional two thousand feet gain in the cruising level. The average number of flights operating on this route was 110 per day. Fifteen percent of such movements have gained in cruising level due to reduced spacing of 40 NM.

2.7 An actual days' statistics reveals that 3 flights gained by 6000ft, 10 flights by 4000 ft and 21 flights by 2000 ft. This scenario was input in IFSET and the results are given below:

**THE IFSET FUEL SAVINGS REPORT FOR LEVEL GAIN BY AIRCRAFT
DUE REDUCED SPACING OF 40 NM IN A SINGLE DAY**

LEVEL GAIN		NO. OF ACFT	OLD FUEL	NEW FUEL	SAVINGS	SAVINGS (%)
FROM	TO		CONSUMPTION IN KGS	CONSUMPTION IN KGS	IN KGS	
29000	33000	2	3000	2700	300	10.0
34000	38000	3	7800	6900	900	11.5
34000	36000	10	26000	24500	1500	5.8
32000	38000	1	2800	2300	500	17.9
29000	35000	1	3000	2500	500	16.7
31000	33000	1	2800	2700	100	3.6
31000	35000	3	8000	7600	400	5.0
33000	35000	4	10700	10100	600	5.6
35000	37000	2	5000	4800	200	4.0
33000	37000	2	5400	4800	600	11.1
31000	37000	1	2800	2400	400	14.3
36000	38000	4	9800	9300	500	5.1

FUEL SAVING PER DAY = 6500 KGS

REDUCTION IN CARBON EMISSIONS PER DAY =6500 * 3.16 =20540 KGS

ANNUAL REDUCTION IN CARBON EMISSIONS= 7.49 MILLION KGS

2.8 The total reduction in fuel consumption was 6,500 kg or reduction of 20,540 kg of Carbon emissions. Therefore annual fuel savings was 2.37 million kg and reduction in Carbon emissions by 7.49 million Kg.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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