International Civil Aviation Organization

The Eighteenth Meeting of the ICAO RVSM Implementation Task Force
(RVSM/TF/18)

Bangkok, Thailand, 30 June – 01 & 04 July 2003

Agenda Item 3: Review Operations

A STUDY ON THE TRANSITION TO SINGLE-ALTERNATE FLIGHT LEVEL ORIENTATION SCHEME FOR THE SOUTH CHINA SEA AREAS

(Presented by the Philippines)

SUMMARY

This paper presents a study on the transition to single-alternate flight level orientation scheme for the South China Sea (SCS) areas for the purpose of integration and harmonization with other States outside of the SCS areas.

1. INTRODUCTION

Flight Level Orientation Scheme

1.1 RVSM was first introduced in the North Atlantic region in March 1997, then followed by the Pacific RVSM implementation in February 2000, and in the European airspace in January 2002. Basically, RVSM as applied in these airspace, follows the single-alternate flight level orientation scheme, where cruising levels to be observed is in accordance with ICAO Annex 2 Appendix 3 a). The implementation of RVSM in the Western Pacific/South China Sea areas in February 2002 brought about the introduction of the modified-single-alternate Flight Level Orientation Scheme (FLOS) specifically for use in the revised new SCS route structure. Modified single alternate means that RVSM EVEN flight levels i.e. FL300, FL320, FL340, FL360, FL380 and FL400 are assigned to the 6 parallel, one-way RNAV routes, while the routes crossing the parallels observe the assignment of cruising levels in accordance with ICAO Annex 2 Appendix 3 b). It should be noted that RVSM is targeted to be implemented in the Bay of Bengal and Beyond areas on November 2003, and at the RVSM/TF/17 meeting, the Task Force agreed that "the single alternate FLOS would be utilized for the application of RVSM in the Bay of Bengal and Beyond. This was to ensure that the assignment of RVSM levels would be consistent with the operational plan for the Middle East and thus obviate the need for transition areas".

2. BACKGROUND

Need for Transition Areas from Single-Alternate to Modified-Single-Alternate, (Western Pacific/South China Sea RVSM Implementation)

2.1 RVSM is already being applied in the Pacific FIRs even before the SCS areas' RVSM implementation in 2002. The application of RVSM based on modified-single-alternate (as adopted in

the SCS areas), requires that some FIRs perform vertical transition tasks in order to integrate the 2 types of RVSM flight level arrangements. As the Manila FIR is situated between the Western Pacific and South China Sea areas, the Manila ACC controllers have to change flight levels based on the flight level assignment agreed upon in the Letters of Agreement between ACCs. Thus, the operational implementation plan for RVSM in the Manila FIR stated 'Single Alternate in Western Pacific/Modified Single Alternate in SCS".

2.2 The issues/concerns that led to the introduction of the modified single alternate in the SCS areas are:

a) numerous bi-directional crossing tracks in the SCS airspace;

b) several airspace not covered by radar; and

c) large deviations due to adverse weather (typhoon) conditions in some FIRs.

2.3 The objectives of the study:

a) to prepare a flight level arrangement, based on single-alternate flight level orientation scheme , which would harmonize with the other States outside of the SCS areas, taking into consideration the concerns stated in 2.2 above;

b) to expand the No Pre Departure Coordination (No-PDC) flight levels, to include those routes crossing the SCS parallel routes, as well as those routes not traversing any of the parallels; and

c) To lessen transition tasks, thus reducing ATC workload.

2.4 The scope of the study covers the new South China Sea route structure including the old existing routes.

2.5 In the RVSM/TF/16 meeting, discussions were made regarding harmonization of FLOS with States outside of the SCS area, and some States proposed that the FLOS be reviewed. It was considered that "ultimately a single alternate flight level orientation scheme should be adopted", hence this study was made in preparation for any transition plan to single alternate FLOS.

3. DISCUSSION

3.1 The initial step undertaken in the study was to classify the routes in the South China Sea areas, with particular emphasis on the 6 SCS parallel routes, as the major point of concern in the classification. This would form the basis for the assignment of No PDC flight levels.

.

3.2 Routes were classified as follows:

I. The 6 parallel one-way RNAV routes;

II. Routes Crossing the 6 parallel one-way RNAV routes;

III. Routes Not Crossing the 6 parallels, but crossing Class II routes; and

IV. Routes Not Crossing neither 6 parallels nor Class II routes.

3.3 Assignment of No-PDC levels for the 4 class of routes:

Route Classification	**NO-PDC Flight Level**	
	Eastbound	**Westbound**
Class I	FL310, 350, 390, 410	FL300, 340, 360, 400
Class II	FL290, 330, 370	FL280, 320, 380
Class III	FL310, 350, 390	FL300, 340, 360
Class IV	all flight levels available (subject to bilateral agreements between FIRs to avoid 'bunching effect')	

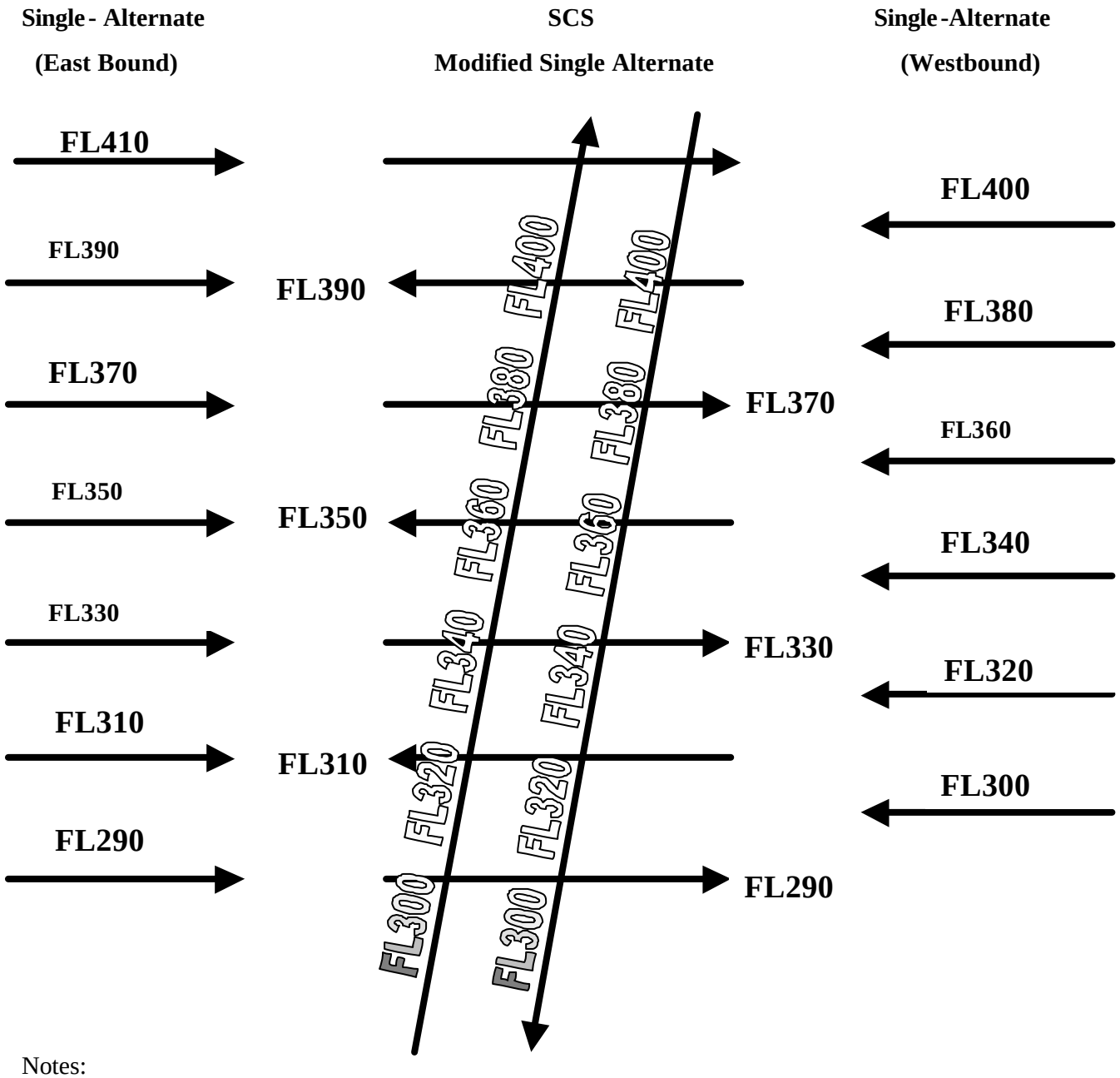
Notes:

1. See Attachment A for explanation on FL assignment
2. See Attachment B for No-PDC FL assignments involving New SCS routes.

4 CONCLUSION

4.1 Participants are invited to note the study and to assess the effect of adopting these flight level arrangements based on single-alternate flight level orientation scheme in their airspace.

ATTACHMENT A



Notes:

1. The chart depicts a scenario where 2 areas on either side of the SCS areas are implementing RVSM based on single alternate, with the SCS areas at the center where modified single alternate FLOS is being observed. The flights of particular concern during the transition are the incoming flights that will operate in the SCS areas.

2. Incoming westbound flights (right-side arrows) will have smoother transition tasks since these are all EVEN flight levels.

3. For incoming eastbound flights (left-side arrows), assignment of RVSM FLs 310, 350, 390 may pose some problem as these are westbound FL assignment for the modified single alternate FLOS, hence for the bi-directional routes in the SCS areas, eastbound flights shall be assigned FL290, FL330 and FL370 as a transition arrangement and No PDC FL.

4. On the other hand, FL assignment for the one-way parallel routes (Northbound) shall be assigned FL310, FL350, FL390, FL410, (NO PDC) as these are unidirectional routes, hence, the chance of opposite direction traffic at the same FL is nil, and EVEN FL300, FL340, FL360, FL400 (NO PDC) is assigned.

ATTACHMENT B

Proposed NO PDC Flight Level Assignment for the New SCS Routes Based on Single-Alternate

New SCS ROUTES	NO PDC FLIGHT LEVEL
L625 (one-way)	FL310, 350, 390, 410
L628	FL290, 330, 370, 280, 320, 380
L637	FL310, 350, 390, 300, 340, 360
L642 (one-way)	FL300, 340, 360, 400
M751	FL310, 350, 390, 300, 340, 360
M753	FL290, 330, 370, 280, 320, 380
M754	FL290, 330, 370, 280, 320, 380
M758	FL290, 330, 370, 280, 320, 380
M761	FL290, 330, 370, 280, 320, 380
M765	FL290, 330, 370, 280, 320, 380
M767 (one-way)	FL300, 340, 360, 400
M768	FL290, 330, 370, 280, 320, 380
M771 (one-way)	FL310, 350, 390, 410
N500	FL290, 330, 370, 280, 320, 380
N875	FL290, 330, 370, 280, 320, 380
N884 (one-way)	FL310, 350, 390, 410
N891	FL290, 330, 370, 280, 320, 380
N892 (one-way)	FL300, 340, 360, 400

Notes:

1. Departing aircraft will be cleared to the flight levels appropriate to the route
2. 10 minutes longitudinal separation will be applied, with MNT, to succeeding aircraft on the same route and at the same FL. Such longitudinal separation will be adjusted for faster or slower preceding aircraft as appropriate.
3. Levels indicated above are intended to facilitate initial departure only. Level allocation once airborne is still subject to normal ATC requirements.

References:

1. "Report of the Sixteenth Meeting of the ICAO Reduced Vertical Separation Minimum Implementation Task Force (RVSM/TF/16)" Bangkok, Thailand 23 – 25 Sep. 2002.

2. Manual on Implementation of a 300m (1,000 ft) Vertical Separation Minimum Between FL290and FL410 Inclusive, International Civil Aviation Organization, Doc. 9574 AN/934 Second Edition-2002.

3. "Report of the Seventeenth Meeting of the ICAO Reduced Vertical Separation Minimum Implementation Task Force (RVSM/TF/17)" Bangkok, Thailand 20 – 24 January 2003.

4. "Appendix I to the Report of the 9th Meeting of the South East Asia ATS Co-ordination Group (SEACG/9)" Ho Chi Minh City, Vietnam 9 – 13 April 2001.

5. " South China Sea Revised ATS Route Structure, RVSM/TF/11 – IP/3 Supplementary Chart"