International Civil Aviation Organization

The 10th Meeting of the FANS Implementation Team for South-East Asia (FIT-SEA/10) and the 17th Meeting of South-East Asia ATS Coordination Group (SEACG/17)

Singapore, 24 – 27 May 2010

Agenda Item 3: Review Outcomes of Related Meetings

OUTCOMES OF THE FIRST AND THE SECOND MEETINGS OF THE SOUTHEAST ASIA ROUTE REVIEW TASK FORCE (SEA-RR/TF)

(Presented by the Secretariat)

SUMMARY

This paper presents a précis of the First and the Second Meetings of SEA-RR/TF (SEA-RR/TF/1 and 2, December 2009 and March 2010, respectively) held at ICAO Regional Office in Bangkok, Thailand.

1. INTRODUCTION

1.1 The first meeting of the Task Force noted that, at the ATM/AIS/SAR/19 Sub-Group meeting, the Route Review Task Force was established to undertake a review of ATS routes in this area. After much deliberation and discussion, the meeting agreed to rename Southeast Asia RNP Implementation Task Force (RNP-SEA/TF) to Southeast Asia Route Review Task Force and set a prime task of reviewing the ATS route structure in the Western Pacific/South China Sea (WPAC/SCS) airspace south of the Fukuoka FIR boundary. The sub-group agreed to a suitable terms of reference to enable the Task Force to carry out this important and timely assignment. Subsequently, APANPIRG/20 endorsed the establishment of Route Review Task Force and the Terms of Reference.

2. DISCUSSION

Outcomes of SEA-RR/TF/1

2.1 The meeting reviewed and took note of work completed as well as on-going work of other Southeast Asia working groups and/or task forces associated with this high profile area. Mr. Peter Rabot (Civil Aviation Authority of Singapore, CAAS), who had been the Chairman of the previous RNP-SEA/TF which successfully completed its initial phase of work in the implementation of 50 NM/50 NM separations on RNP 10 routes L642 and M771.

Statistical Aircraft Data Collection and Analysis

2.2 The meeting noted that traffic data collection had been undertaken by States to assist in determining that the Target Level Safety has been, and continues to be, met in RVSM airspace. Nevertheless, this traffic data sample for RVSM is generally only for one month each year and it was considered that a more expansive data collection covering many aspects should also be undertaken when a major route review is contemplated in an area like South East Asia. For example, there are certain factors which need to be assessed across a broader timeframe.

2.3 In order to achieve this additional traffic data collection, cooperation from States was required over the period of the data sample. In addition, the assistance of an organization who can then translate the collected data was considered necessary so as to present the best way to structure a new ATS route structure to gain maximum efficiencies in the area concerned.

Establishment of a Data Statistics and Analysis Working Group

2.4 The meeting decided to establish a Data Statistics and Analysis Working Group (DAWG). Each State would provide a contact point that would be responsible to provide the necessary data to the DAWG.

2.5 The information collected would be used to judge strategies in advancing the Task Force in the construction of a new or revised route structure. Data collected may also be used for other purposes, especially in the development of a safety assessment of any changes made to the present route structure. The meeting considered that this subject was an important issue. What particular data should be collected and analysed was also raised and it was finally agreed that live data would give a better picture of the status of aircraft rather than flight plan information.

2.6 It was agreed that Thailand and Singapore carry out the task of collation and analysis of the data. Both States have shown extensive past experience in producing effective results in this important area. The meeting agreed that States involved in data collection would supply one week data catch every month to Singapore and Thailand, commencing in January 2010. The selected week was agreed as the third week of each month commencing in January 2010 at 0001UTC on the third Sunday. It was stressed to the meeting that, to gain full value from the data collection, it was imperative that the notified dates for data collection be followed, otherwise value would be impaired in comparison of aircraft movements through the designated area. The meeting considered that this procedure along with the data collected during the RVSM sample in December each year would be sufficient to enhance decisions required by the task force.

IATA Outlook on Southeast Asia Route Review

2.7 The meeting noted that, in accordance with the IATA User Expectations concept, which were submitted and accepted by APANPIRG, routes should be designed to enable the shortest possible distance between airports, as well as delivering aircraft into and out of the Terminal environment with the maximum efficiency. Primary routes should be unidirectional enabling greater capacity and increased safety.

2.8 It was also suggested to the meeting that routes should be based on RNAV/RNP utilizing existing aircraft capabilities with separation standards applied based on ATM capabilities. Where possible, ATM capability should be enhanced with direct surveillance and communication capability.

2.9 The meeting was further requested to consider that crossing routes and/or conflict points should be planned to occur within direct surveillance coverage where possible. An extended track of a few nautical miles may be more beneficial for all stakeholders to enable the utilisation of greater surveillance capability and reduced separations.

Proposals for the Establishment and Revision of ATS Routes

2.10 Viet Nam advised that they fully support all ICAO past initiatives in the area of Southeast Asia as well as the work contemplated by RNP-SEA/TF. They expressed a willingness to also take into account proposals which may be put forward by the users of the ATM service. Viet Nam gave an update of the revised route structure, both domestic and international, over the past few years as well as some proposals for future enhancements.

2.11 The eastern SCS routes were not covered by direct surveillance and must be based on RNP 10 and RNP 4 principles. Implementation of RNP 10 50 NM longitudinal and RNP 4 30/30 NM will be reliant on the implementation of ADS-C/CPDLC within Manila FIR, which is expected to commence trialling in late 2010.

2.12 IATA put forward an indicative proposal for consideration. The first proposal was the establishment of uni-directional routes and realignment of A1 and A202 between Hong Kong and Bangkok. The routes were completely covered by radar surveillance and VHF communication therefore could be RNAV 5 (or RNAV 2) routes in alignment with the ICAO Regional PBN plan. The current routes should be straightened where able to do so and utilising radar spacing in the longitudinal plane. A1 could also be moved further north, clearing an area used for arrivals and departures by Hong Kong.

2.13 Vietnam observed that both A1 and A202 crossed W1 in their airspace and that traffic on W1 was increasing. It will be important that these crossing routes are considered with every new proposal ensuring that the needs of all stakeholders are met.

2.14 If the realignment of A1 was agreed to, the primary SCS routes of L642 and M771 could also be realigned slightly westwards through Sanya FIR into Hong Kong FIR. The routes are currently RNAV 10 utilising 50/50 separations and while RNP4 could be available, they are also then completely covered by surveillance and VHF communication. As such, rather than an interim change utilising RNP4, it is proposed that the routes undergo a minor change in the short term and plan in the longer term for the establishment of RNAV 5 (or RNAV 2) routes utilising radar type separation.

2.15 Routes crossing the six SCS routes were seeing increasing traffic numbers but were still not as heavily utilised as the primary SCS flow. They are however bi directional at present and the establishment of uni-directional routes could potentially realise increased level availability on the primary routes.

2.16 Crossing routes that could be established as uni-directional routes in the short term are L628 (Manila to Bangkok)**,** M768 between Brunei and Ho Chi Minh/ Bangkok) and finally A461 (Hong Kong to Manila). It was suggested that these routes should be realigned where possible but due to incomplete DCPC/ADS-C/CPDLC coverage could only be established as RNAV 10 routes in the short term.

Safety Assessments and Monitoring Requirements

2.17 The meeting was advised that, to ensure that the introduction of PBN en-route applications within Asia/Pacific Region is undertaken in a safe manner in accordance with relevant ICAO provisions, implementation shall only take place following conduct of a safety assessment that has demonstrated that an acceptable level of safety will be met. This assessment may also need to demonstrate that levels of risk associated with specific PBN en-route implementations are acceptable.

Identification of Regional Performance Objectives

2.18 Based on the review of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Key Priorities, the Sub-Groups' Task List and comparative analysis with IATA user expectations, the meeting prepared Performance Frame Forms (PFFs) for the ATM, AIS and SAR Regional Performance Objectives listed below:

APAC ATM 1 (*RASMAG)* – Airspace Safety Monitoring to achieve regional TLS.

APAC ATM 2 – Optimise Traffic Flow

APAC ATM 3 – Optimise Route Structure in En-route Airspace

APAC ATM 4 – Optimise Route Structure in Terminal Airspace

APAC ATM 5 – Implementation of New ICAO Flight Plan Provisions

APAC AIS 1 – Enhanced Provision of AIS/AIM

APAC SAR 1 – Enhanced Search and Rescue Capability

Proposals for Improvements to South China Sea Airspace Operations

2.19 The meeting recalled that, taking into consideration the amount of work required especially in regard to the required safety assessment process as well as other considerations, after a consistent and methodical process over two and a half years, L642 and M771 were approved for use for 50 NM lateral and 50 NM longitudinal separation on 2 July 2008. Considerable discussion took place and it was finally decided that the same philosophy should also be used for the other established parallel routes in the South China Sea area. The meeting therefore endorsed six recommendations.

2.20 It was agreed that a Safety assessment should be conducted prior to the introduction of 30NM standard and it should be straightforward, following the model of that of the 50NM longitudinal separation standard case. The meeting had extensive discussion on Recommendation 5 & 6 and felt that more in-depth study would be required. The meeting agreed to further discuss the two recommendations at the SEA-RR/TF/2 meeting.

High Level Objectives of SEA-RR/TF

2.21 The meeting was advised that the work of the Task Force should be focused around two high level objectives, i.e. safety, operational efficiency and environmental impact. It was agreed that any plans developed should be assessed against these two high level objectives. Taken together this would form a qualitative methodology which could satisfy the needs and responsibilities of all stakeholders.

2.22 It was recalled that in October, a high-level meeting of ICAO Member States representing 93% of global commercial air traffic reached agreement on further reducing aviation's impact on climate change, in cooperation with the air transport industry, through, inter alia, a global goal of 2% annual improvement in fuel efficiency until the year 2050 and submission of States' action plans and annual reporting on CO_2 emissions to ICAO.

2.23 It was further noted that IATA had also set targets with respect to the environment, namely an average annual fuel efficiency improvement of 1.5 % from now until 2020, carbon neutral growth from 2020, and a 50% reduction in carbon emissions by 2050, compared with 2005 figures.

2.24 In recognising the need to provide an operational environment which could cater for the forecast traffic growth and, at the same time, adequately address environmental issues, the meeting was of the opinion that full surveillance coverage over the area under consideration (radar, ADS-B Out; ADS C-CPDLC as appropriate) and the harmonisation of the operational application of this surveillance across FIR boundaries was fundamental in planning to achieve these targets.

Initiate Teams or Groups to Address Specific Measures with Regard to the Route Review

2.25 It was recalled that, under the Terms of Reference of SEA-RR/TF, mention was made in Para. f) that the Task Force shall "*Consider setting up appropriate teams/groups which might but not necessarily, include the entire Task Force, to address and implement specific agreed measures within specific airspaces."*

2.26 It was also noted that the costs to aviation administrations in the purchase of new ATM systems, together with airlines in the re-equipage of aircraft fleets, needs to be taken into consideration when developing and implementing updated procedures in accordance with ICAO provisions, in order to gain maximum benefits to all concerned.

2.27 The area under consideration covers a considerable amount of airspace, managed by many FIRs. To influence a beneficial result in all areas under consideration, it was considered that when appropriate, management of the changes should be specific to all sub-areas within the whole framework of the SEA. As an example, there are two major traffic flows in the area; the major flow from southwest to northeast and the other flow, although not as large in traffic numbers, from West to East.

2.28 By establishing appropriate teams/groups within the Task Force, it would enable agreed changes to be made, which therefore enhances the coordinated work accomplished by the task force in an appropriate time frame.

2.29 An example of this type of working arrangement was the EMARSSH project which covered changes to the ATS route structure from Australia to the Eastern shores of the Black Sea. This involved States from three ICAO Regions, 32 States and around 38 FIRs. Although the format of such groups was slightly different in that the meetings commenced looking at the eastern sections and working towards the western States involved, the concept was similar to what is being proposed for the SEA Task Force. The meeting recalled that the EMARSSH project was implemented in less than two years from the first meeting of the Task Force.

2.30 Consequently, it was decided to concentrate on the route structure itself. It was finally agreed that, as this was the first operational task, it would be more appropriate to have all involved, due to the relatively small area under consideration.

Outcomes of SEA-RR/TF/2

Review Current Operations across South-East Asia and Identify Problem Areas

Unidirectional Crossing Routes

2.31 Despite continuing traffic growth, there have been times when traffic decreased due to specific unfortunate events such as SARS, the Swine Flu epidemic and the economic recession. Fortunately, the economy is now slowly returning to normal and with the resilience of the aviation industry, traffic growth, although a little slower than before, is on the increase.

2.32 During most of this time, the South China Sea (SCS) had been operating on an RNAV 80NM or time-based separation standard of 10 minutes in oceanic areas outside continuous radar coverage Approximately 2 years ago, with the advent of ADS-C/CPDLC procedures, there is now two unidirectional routes, L642 and M771, which allow 50NM spacing between FANS equipped aircraft.

Proposal to Implement Parallel Tracks Crossing the Major Traffic Flow

2.33 It was recalled that there are several ATS routes which cross the main traffic flow serving major airports in the northeast/southwest portions of the SCS. These crossing aircraft also need to be accommodated with economical efficient levels. By duplicating these crossing routes and using a spacing of 60 NM, fewer levels would be required for these aircraft by establishing a unidirectional system using same levels, which should provide additional flight levels to the primary routes within the SCS.

2.34 The following crossing routes which could be designed in this fashion are as follows:

a) M768 Brunei to TSN
b) L628 Manila to PCA
c) A461 Manila to Hong Kong
d) B462/ B348 Manila to Taipei

2.35 These routes are considered as the most used routes crossing the major traffic flow in the South China Sea area.

2.36 Other crossing routes which may also be considered for unidirectional pairs are:

a) M772 Jakarta to Hong Kong; and,
b) A583 Australia via Zamboanga to Hong Kong

2.37 Malaysia presented a safety study on the proposed 2nd unidirectional route to M768 crossing the South China Sea This detailed safety study arrived at the conclusion that the proposed parallel route to M768 should be located to the East of the present M768 rather than west of the present route. This alternative proposal was considered to have merit as it would reduce conflictions with other traffic proceeding from/to West Malaysia and Singapore to airports in East Malaysia and Brunei in particular.

2.38 The meeting also noted that other issues which would need to be taken into account when deciding on these new initiatives.

2.39 Philippines advised the meeting they support the establishment of a unidirectional parallel route to L628 which crosses the major traffic flow from Manila to Bangkok. They also pointed out that L628 also interacts with three other routes, namely M772, M754 and A583.

2.40 To address operational issues (merging and bunching of traffic) and to prevent potential conflictions at the intersecting points, the Philippines recommended an additional route parallel route to the existing RNAV Route L628 so as to enable the establishment of a unidirectional traffic flow. This will allow airspace users more access to optimum flight levels, ATC has more flexibility in selecting alternative flight levels and ultimately, to the environment through reduced carbon emissions.

2.41 The request was noted, however, further discussion on level allocation for routes crossing the major traffic flow was still required. A principle reason for the additional unilateral new crossing routes was to allow the major traffic flows, which have comparatively more traffic, to have additional flight levels (one or two) to cope for the expected growth on the Primary routes. This proposal was therefore left to be considered at future meetings of the task force.

2.42 The meeting noted the proposals and could see benefit in the establishment of parallel routes crossing the main traffic flow. However, some States would require further study on this matter.

2.43 In developing any proposal to implement parallel unidirectional routes crossing the major traffic flow, it was strongly suggested to the meeting to study each proposal separately to confirm that there are benefits to both the users and ACCs concerned. In addition, any difficulties should be assessed and consideration be given to overcome these difficulties if it means changing the position of the new parallel route. Finally, the programme for implementation could be looked at either singularly or multilaterally covering all the proposed changes.

Formation of Dedicated Small Working Groups

2.44 The meeting noted that the title of the Task Force, Southeast Asia Route Review, opens many areas for discussion. Amongst these subjects would be:

a) Introduction of RNP 10 horizontal separation where applicable;

b) Unidirectional RNAV routes on tracks crossing the major traffic flow SW/NE;

c) Unidirectional routes between Bangkok and Hong Kong including matters which need to be addressed in the strategic plan for this proposal to successfully proceed;

d) Data collection and analysis on most project items to ensure that qualified data indicates a reason to proceed;

e) Necessary safety related issues which are required to be addressed before implementation; and,

f) Realistic target dates to complete all projects within the overall framework of the SEA-RR/Task Force.

2.45 Where a particular subject can be separated from most other items, a small working group consisting of States concerned, along with international organizations where required, could discuss in detail the work required and when completed, submit the recommendation to the plenary task force meeting for final analysis and evaluation.

2.46 It was also mentioned that where one group requires input from another group on a specific issue, this could be arranged by working together on the matter until resolved, then going back to respective groups to complete their allotted tasks.

2.47 In considering the initial phase of the work programme for the SWGs, three such groups should be formulated with specific tasks:

a) SWG/1 - Data Collection and Analysis. This SWG has already been formed by agreement from SEA-RR/TF/1

b) SWG/2 – Improvements and modifications to the major traffic flow. This SWG would also be tasked if requested in other international route proposals submitted by States outside the major traffic flow.

c) SWG/3 - RNAV Routes crossing the major traffic flow

Analysis of One Week Traffic Sample Data Submitted by States

2.48 A detailed analysis of a one week traffic sample data submitted by the States in the region to the Data Statistics and Analysis Working Group was provided.

2.49 It was considered that this type of data would be extremely useful when the Task Force becomes more involved in the decision making of the final product of realignment of the present route structure and the introduction of additional routes to increase efficiencies.

RNAV Route Adjustments in the Southeast Asia Area

Unidirectional Reroutes Replacing A202and A1

2.50 It was recalled that, at the SEA-RR/TF/1 meeting, in order to increase efficiency in route design which would also reduce track miles and carbon emissions, consideration should be given to some variations of the present route structure as well as looking at the feasibility of using specific unidirectional routes where traffic density demanded. Two examples where this strategy could be used was in respect to ATS route A202 and also to A1. Both of these routes were between Bangkok and Hong Kong.

2.51 The diagram presented was generic in nature however it gives examples of 2 pairs of routes approximately 20 NM apart, under full radar coverage, where significant benefit could be obtained to both the users and the providers of the ATS service.

2.52 It was suggested that this type of operation deserves serious consideration in the SCS area, especially where, by slight amendment to the present route structure, some routes presently outside full radar/VHF coverage could be included under RNAV 5 procedures

2.53 It was, however, recognized that there were other considerations to consider such as military issues which could affect the nature of this proposal. Nevertheless, consideration of this methodology, with appropriate civil/military coordination, has brought positive results in the past.

Concept of Unidirectional Routes in the Southeast Asia Area

2.54 There was considerable discussion on the concept of unidirectional routing in the Southeast Asia area.

Realignment of L642 and M771

2.55 Consideration was also given to move segments of the present routes L642 and M771 between Ho Chi Minh FIR and Hong Kong FIR to the west of their present position so that both these routes could be RNAV 5 routes under full radar and VHF coverage. Further discussions on this proposal were deemed necessary as it would need to be considered depending on results of the A202 and A1 proposed changes.

Introduction of Data Link Service within the Manila FIR

2.56 The Philippines confirmed that their data link system with an upgraded ATM system was scheduled to be installed mid 2010 with an expected data link trial commencing Q4 2010. The initial trial will be in the Eastern portion of their airspace to test the capabilities in a low density area of their FIR. It is expected that the trial will expand to the western portion of the Manila FIR in 2011. This indicated full operational data link services may be available in the Manila FIR in 2012.

IATA Review on South China Sea Routes

2.57 IATA advised that the primary SCS routes L642/M771 already enjoy almost complete surveillance and VHF coverage with only one gap between Singapore and Vietnam.

2.58 At SEA-ADS-B WG/5 (January 2010), proposed timelines were presented that should enable operational separations to be applied based on ADS-B late 2011/early 2012. As such, the principles of RNAV5 may provide more advantages to stakeholders than RNP4, based on the complete surveillance and VHF coverage expected. However there were several requirements that still need to be fulfilled which may delay RNAV5 until approximately 2014.

2.59 In the meantime, based on the traffic data available, there is potential benefit in pursuing the application of RNP4 separations between suitably equipped aircraft. With the potential for RNAV5, there is no need to redesignate the route, but availability could provide ATC with increased efficiencies and capacity.

2.60 Singapore supported the proposal that RNP4 separation should be available on L642/M771 in the short term.

Establishment of Uni-directional RNAV Routes between Southeast Asia and China

2.61 It was noted that significant benefits would be enabled by establishing uni-directional RNAV routes between Bangkok-Beijing and Bangkok-Shanghai. This would not only serve traffic between these airports but also for Malaysia, Singapore and potentially beyond.

2.62 China advised the meeting that all proposals put forward at this Task Force affecting China will be carefully considered by CAAC and ATMB.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the report précis of SEA-RR/TF/1 and 2.

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