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Agenda Item 2.4: ASIA/PAC Air Navigation System and Related Activities

APANPIRG Year in Review Report by the Airspace User

(Presented by IATA)

SUMMARY

This paper presents a report of the Airspace User Perspective on the progress, developments and direction to take in the field of Air Navigation Services.

1. **INTRODUCTION**

1.1 Consultation with the airspace user is a critical part of airspace planning and review. This paper attempts to represent a consolidated airline view to the ongoing programmes within the Asia Pacific Region that will assist APANPIRG and States with their 2002/03 work programmes. Therefore, the following discussion will highlight areas of mutual interest to APANPIRG and the airline community.

2. **DISCUSSION**

2.1 Airline Bill of Health

2.1.1 The year 2001 was, without doubt, the worst year in the history of the air transport industry. Even before September, the outlook for IATA Member carriers in 2001 was bleak. The economic slowdown in many major countries had resulted in a slowing down of passenger traffic growth, and a major decline in freight traffic growth. The loss of passenger confidence after the September 11th terrorist attacks in the United States served to deepen the gloom surrounding industry profitability and growth prospects.

2.1.2 The combination of sharply reduced traffic levels, ongoing falls in yield levels (-1.7% on IATA international scheduled services) and rising costs courtesy of increased security and insurance charges instigated a financial meltdown in the global aviation industry during 2001. On international scheduled services, IATA members are estimated to have made an operating loss of US\$9.5 billion compared with a profit of US\$6.2 billion in 2000. In the first two months of 2002, carriers registered in South America had a fall in passenger traffic of 24.3 percent. North American carriers had a 10.4 percent fall, Europeans a 7.2 percent fall, but Asian carriers were only 3.6 percent down.

2.1.3 The good news is that the industry is recovering slowly with many carriers based in the Asia Pacific region taking the lead in recovery. However, significant portions of international operations are not of Asia Pacific origin and some of these carriers are struggling for survival.

2.1.4 **CONCLUSION**: Any airspace planning that involves cost that is not absolutely necessary will have some airlines strongly objecting to those plans being implemented. Some airlines are not even interested in a long-term benefit if it requires a cost up front because cash reserves are at all time lows. Therefore, the 2002-03 season of airspace planning needs to be very sensitive to airline's needs for survival. IATA will continue to assist States in their airspace planning activities by surveying airlines and consolidating industry positions.

In alphabetical order, other issues include:

2.2 AIS

2.2.1 Proper and timely AIS data is critically important to airline operations. Most international operations navigate via Flight Management Systems with flight data that resides in the database. Therefore there is a huge reliance on data that is 100% accurate 100% of the time. Unfortunately that is not true and there have been times where 1 out of 1000 waypoints would not be accurate, which requires airlines to review and simulate data, especially in the critical areas of the TMA.

With the 1 November 2001 implementation of the new South China Sea route structure, the 2.2.2 airlines experienced what was almost a total melt-down in operations due to the incomplete and inaccurate data being provided by some States AIS. Major revisions to airspace require data to be submitted 70 days prior to its implementation to allow for the normal process of verifying and coding flight navigation data. The South China Sea Task Force planned on a 12 July target date for promulgation of AIP Supplements. The task force later changed this to 9 August. On 25 September the last of the AIS data was being received. This gave chart makers and FMS data suppliers a supreme and expensive headache because the overdue AIS data coupled with contract support deadlines, union agreements and extensive overtime expenditures created a logistical nightmare. As it turned out several States got the data to one chart/data supplier only 13 days before FMS processing began, rather than the pre-planned 50 days. The airline specific procedures did not make delivery and the last second delivery of general data forced some airlines to cancel simulation training and run data verification on double shifts. Many airlines did not get their charts until 4 days after implementation and some airlines seriously considered cancelling all their flights in the South China Sea until relevant charts and flight management data was received and verified. The 1 November implementation should have been postponed as not all involved States met their AIS obligations in accordance with the Annex 15 SARPS.

2.2.3 Consequently both ICAO and IATA have adopted a strict adherence on proper and timely AIS for airspace planning and it is anticipated that AIS should not be a problem for the mega-project of EMARSSH.

2.2.4 There however continues to be problems, misunderstandings and misuse of international AIS:

- Unless the need is absolutely critical, implementation should always be on an AIRAC date.
- The general rule of thumb is to promulgate AIS data two AIRAC cycles prior to implementation. This is especially important if the procedure is mandatory and replaces an existing procedure.
- If a new airway or procedure is not mandatory and does not replace a procedure that is already in use, then promulgation of AIS data one AIRAC cycle prior to implementation is acceptable.

2.2.5 **CONCLUSION**: All airspace planning forums must strictly enforce the Annex 15 SARP requirements for AIS. IATA is pleased with ICAO's new role in putting AIS matters as top priority and States commitment to timely and accurate AIS. States are also asked to consider the airline requirements in determining whether one or two AIRAC cycles are needed for promulgation of AIS data.

2.3 Afghanistan

2.3.1 The closure of the Afghanistan airspace cost IATA Asian and European airline members approximately 350,000 USD per day. Fortunately much of the Afghanistan's ATS equipment was not too severely damaged. IATA, with the helpful contributions made by Lufthansa of two new HF radios, Singapore Airlines for free cargo transport and to Nortel Dasa Satcom who donated replacement parts for the damaged VSATs, was able to repair three VSAT stations with their corresponding VHF radio sites. IATA also restored the AFTN terminal in Kabul and their VSAT direct speech circuits with Pakistan and Uzbekistan. The four routes, with the exception of a high base altitude of FL310, under the control of Afghanistan civil controllers, has Afghanistan ATS operating very close to the pre-Sept 2002 level of service. However, IATA remains concerned that the remaining controllers are near retirement age and there is an urgent need to train new Afghan nationals as controllers for Afghanistan.

2.3.2 The almost 25 years of war had destroyed all the ground radio NAVAIDs in Afghanistan. The current war had further damaged airports and runways in particular are in desperate need of repair. Now is the time for Afghanistan to be rebuilt. IATA had recently asked airlines what are their requirements for Afghanistan and concluded that international enroute flights over Afghanistan do not need any ground based radio navigation aids, now or in the future. As for instrument procedures into airports in Afghanistan, the airlines looked at the terrain, its obstacle limitation to precision instrument procedures, the harsh conditions of the country, supporting infrastructure, the lack of qualified technicians, along with the lack of local traffic. It was not possible to justify the cost of extensive new ground radio navigation aids and concluded that the preferred solution was to use RNAV/RNP/GPS as the primary means for non-precision approaches. However, when GPS is used as sole source for navigation, local regulations require that the filed alternate must have a conventional ground navaid based instrument approach procedure. The rule of thumb that airlines presented to IATA was to ideally have such an alternate about 30 minutes flying time from the filed destination airport. Therefore, IATA is looking into a requirement of having a DVOR/DME at Kandahar airport, which is a flat area that can accommodate good instrument approach procedures and is approximately 30 minutes jet flying time from all other key airports in Afghanistan. The Afghanistan Ministry of Civil Aviation and Tourism had in 2001 already developed GPS non-precision approach procedures for the Afghan airports of Herat, Jalalabad, Kabul, Kandahar and Mazar-I-Sharif. These were designed by the New Zealand Airway Corporation to comply with ICAO PANS-OPS criteria. However, MCAT do not have the means to flight check these procedures. The airlines would be grateful if States could assist in arranging a qualified flight check of these instrument approaches.

2.3.3 The opening of Afghanistan and its joint use by civil and military operations has had its share of problems. The most noted problems were a period when very confusing and contradicting NOTAMs were being issued by the Military coalition forces controlling the airspace and some air misses with large military aircraft flying at IFR altitudes, but not on ATS IFR clearances. Although Afghanistan is in the ICAO MID region, the ICAO ASPAC office was very instrumental in organising two very important meetings to help resolve these issues. IATA is grateful to the ICAO Asia Pacific Regional Office for their leadership role on addressing and helping to resolve these important operational issues.

2.3.4 **CONCLUSION**: The airlines' needs for an Afghanistan ATS infrastructure are simple and very little additional hardware is required in order to meet this need. However, human resources such as air traffic controllers, technicians and airport infrastructure are still in desperate need. Donor

programmes into these areas would be of major benefit to Afghanistan and the airspace users providing both international and domestic air transport services.

2.4 CNS/ATM

2.4.1 Due to promises and commitments by States and ICAO, many airlines have invested in the FANS 1/A system. There are now in excess of 2000 FANS 1/A capable civil air transport aeroplanes in service. The US Military have committed to 1700+ FANS packages under their GATM program and every A340, A330, A380, B767, B777 and B747 is rolling off the assembly line with either FANS 1/A enabled or immediately available with a software change. Consequently there are a significant number of integrated or stand-alone FANS automation systems in place with the State ATS Providers. Regrettably, there is very little benefit being currently realised by this tremendous investment by States and Users in FANS technology.

2.4.2 IATA has been pleased with the work of ISPACG and IPACG in the development of the FANS Interoperability Teams (FIT), with the creation of the South Pacific Operations Manual and the later creation of the North Pacific and Indian Ocean versions of the operations manual. It should also be noted that other individual States have made great strides with FANS technology, such as in western China, Mongolia, eastern Russia and the UM501 operations in the Bay of Bengal. However, the benefits are sporadic throughout the region and much more needs to be done to make the FANS generation of CNS/ATM into a positive business case that was promised to airlines 10 years ago.

2.4.3 IATA would specifically like to see more ICAO assistance in fostering the expansion of existing CNS/ATM capabilities within the Region, particularly in the planning, trials and demonstrations of CPDLC, ADS and RNP4. As for ADS and CPDLC there is a region-wide need to coordinate and address the interoperability issues that the informal planning groups have taken on. This would include reenergizing the FANS Action Team for the Bay of Bengal (FATBOB) that was formed under the auspices of ICAO two years ago and to establish a FANS Action Team in the South China Sea and in other areas such as China and Mongolia. Much of this need was addressed by the ATS/AIS/SAR SG/12 and the resulting DRAFT Conclusion 12/5 on Key Priorities for CNS/ATM Implementation.

2.4.4 **CONCLUSION**: It is of utmost importance that both providers and users start to realise the safety and economic benefits of existing CNS/ATM. Otherwise, the next generation of CNS/ATM has very little chance of gaining airline acceptance to its promises.

2.5 Cross-Polar Routes

2.5.1 The cross-polar tracks represent a route structure that will for the first time ever allow nonstop service between some North American and Asia cities that had not been possible under previous routing schemes. These new routes coupled with the deliveries of the new ultra long-range aircraft would hopefully see this new level of service being introduced starting in 2003. This will be of particular importance to international travel as China's entry into the WTO and the 2008 Olympics will create greater demand for flights between these two continents.

2.5.2 However, the cross-polar tracks <u>must</u> be a track system of daily choice. There are four major factors that must be considered in flight planning the cross-polar tracks, which are choosing the minimum time track, keeping suitable alternate aerodromes within ETOPS parameters, and avoiding air masses of extreme low temperatures and high radiation. Studies have shown flight time differences between the cross-polar route options available for a given city pair to be as high as two hours, which means that a track normally flown for a given city pair could be an impossible option on the day of departure. In addition, there are times when cold air masses would present an unacceptable

long-term exposure to extreme low air temperatures, once again presenting impossible track options on the day of departure for certain airframe types.

2.5.3 The problem is that the flexibility of daily choice does not exist today and the ability to flight plan the best cross-polar route is critical in justifying a market plan that relies on Cross Polar routes. This will require China to adopt a policy that will allow airlines to flight plan which route to fly on each day of departure. This is currently being addressed in the ICAO CMRI Task Force.

2.5.4 CONCLUSION: Airlines must consider these issues (and more) when flight planning, which directly relate to the safety, legality and efficiency of flight. Until these flight-planning issues are resolved, the Cross-Polar Track System will never realise its potential as an efficient route system for long-range non-stop service between Asia and North America. Some airlines will continue to fly these routes, but they will be very few in number due to the unpredictable high cost of operation.

2.6 EMARSSH

2.6.1 The Revised ATS Route Structure - Asia to Middle East/Europe, South-of-the-Himalayas (EMARSSH TF) is turning into a true success story of:

- a) Addressing routes properly from an end-to-end perspective,
- b) Taking advantage of long standing existing aircraft capabilities (RNAV),
- c) Demonstrating how civil and military can work together and dynamically share the airspace,
- d) Demonstrating how airspace planning does not need to be contained within a single ICAO Region,
- e) Demonstrating the power of international teamwork among States, airlines, pilots, controllers, and AIS suppliers,
- f) Demonstrating the effectiveness of the new ICAO Asia Pacific concept of conducting large projects by a Core Team, and
- g) Putting AIS in the proper perspective in airspace planning.

2.6.2 Phase I of EMARSSH introduced more efficient routes between Asia and Australia and Phase II is all the rest between Asia – Europe and Middle East. Phase II is a major project to be scheduled for completion 21 months and eight meetings after its start. If all goes as planned, on 28 November the airlines and State ATS Providers will experience a more streamlined, balanced and conflict free network of routes. While this is a major enhancement, it should also be noted that more improvements are needed before the airlines would consider this as the fix route solution of choice for the long-haul operations between Asia and Europe/Middle East. Therefore, areas that airlines would like to address includes:

- a) The benefits that can be gained by the proposed FANS route Himalayan-1 (Kunming Kathmandu Islamabad),
- b) Implementation of the two new crossing points and associated routes between India and Pakistan (that already are agreed in principal by the ATS Providers),
- c) Creation of a Mumbai Haima route that would link Hong Kong/Bangkok with Saudi Arabia,
- d) Creation of direct routing between Bangkok and Chennai,
- e) Abolishing the penalizing restriction that require flights southwest bound out of Bangkok to fly at either FL260 or FL390 for the Bay of Bengal leg of ultra long-haul operations to South Africa.

It is envisage that RVSM, which is scheduled to be implemented in November 2003, will provide deconflicted options to those flights that cross the main trunk routes overseas linking Asia – Europe.

2.6.3 **CONCLUSION**: APANPIRG should note that accomplishments that EMARSSH represent, which is much more that "just" a new and more efficient route structure. IATA greatly appreciates the extraordinary efforts that were made by involved States, the Core Team and most importantly by the ICAO Secretariat. However, APANPIRG must also realise that phase I and phase II do not fully meet the airline requirements. New routes are still required to meet city pair requirements and RVSM

will present a major enhancement to oceanic operations in particular. However, IATA believes that the normal airspace planning forums, such as SEACG, SWACG, BBACG, etc. should be able to take over where EMARSSH has finished on 28 November 2002.

2.7 Frequency Spectrum

2.7.1 The ITU Asia-Pacific Telecommunity Conference (APT) Preparatory Group Meetings for WRC-2003 is an extremely important planning body tasked with determining how the Asia Pacific States will vote for WRC-2003. The APT literally represents a significant block of votes for the upcoming WRC 2003. The most important aviation issue that could be threatened is the 5GHz band for MLS and "extended MLS". While the MLS is a clearly defined objective, it is perceived as only having limited support among the aviation industry. More importantly, the objective for extended MLS (5091-5150 MHz) is not clearly defined and has been noted as essential for runway incursions but without any specific programme.

2.7.2 **CONCLUSION:** APANPIRG should note that the APT requires more information on the justification for 5091-5150 MHz and it is urgent that all who represent aviation's needs are prepared to defend this important frequency spectrum.

2.8 **Routes and the Air Navigation Plan**

2.8.1 It was discovered that while action was being undertaken to remove routes from the Air Navigation Plan as agreed in airspace planning forums, there had not been action taken to place proposals that were agreed at these airspace planning forums into the air navigation plan. While it would be work prohibitive to go back and collect all the route proposals and circulate them for amendments to the ANP, it is very important that ICAO and States take advantage of the work done by these forums in keeping an up to date and realistic ANP.

2.8.2 **CONCLUSION**: Airspace planning forums should be used to review and update the Asia Pacific Air Navigation Plan. IATA will do its part to bring this to the attention of the meetings secretariats so that such agreements are recorded in Summary of Discussions and action can be taken to circulate all the route proposals for either addition or deletion in the Air Navigation Plan.

2.9 Safety's Need for a Non-Punitive Reporting System

2.9.1 IATA is a common focal point for airline reports that provide important feedback to State ATS Providers. These reports are critical in helping a State to understand its strengths and weaknesses and will greatly assist in the effectiveness of their Safety Management programmes. For the most part, the delivery of bad news is graciously received and it is believed that action is taken to mitigate further occurrences of the problem, i.e. lessons are learned and all are further educated and experienced on how to more safely manage the air traffic system. However, there have been some occurrences of harsh punitive action taken – such as the dismissal or prosecution of an air traffic controller that airlines believe are unnecessary and counterproductive. A fact of life is that humans manage the air traffic system. Humans are not perfect and are prone to human error. If a report results in harsh punitive action taken then airlines become very reluctant to provide any further reports when there is a mishap. This becomes a giant step backwards in safety and takes away a very important mechanism in safety management.

2.9.2 CONCLUSION: It is critical that States develop and maintain a healthy non-punative reporting mechanism that will encourage reporting of safety hazards.

2.10 SCS New Route Structure

2.10.1 The introduction of the new South China Sea route structure on 1 November 2001 and the implementation of RVSM on 21 February 2002 brought a new level of efficiency, capacity and safety to the major traffic flows in the South China Sea. However, while some areas saw major improvements to operations there are other areas where smaller traffic flows were significantly penalised with the new route structure.

2.10.2 The airlines provided IATA with some early feedback on the operational impact of the new routes, which is found at the table below:

<u>City Pair</u>	Flight time*	ATC Delay
HKG-BKK	-5	-1
BKK-HKG	-6	-2
HKG-SIN	+6	-2
SIN-HKG	-3	-1
HKG-JKT	+23	-1
JKT-HKG	+13	+2
HKG-KUL	-1	-1
KUL-HKG	-2	+1
Brunei-MID	+16	

* Note: A negative number shows a reduction in flight time, which is an improvement.

2.10.3 The data presented above is preliminary and should hopefully be more mature at the SCS one year review task force. However, it should be noted that the Hong Kong to Jakarta city pair has suffered significantly since 1 November and is reported by one airline alone to carry an additional 4.6 million USD annual increase to their one flight a day operation. There is also significant penalty for aircraft flying from Brunei to the Middle East/Europe by an additional 110NM, which gives a time penalty of 16 minutes over the (Kota Kinabalu to Phuket) route flown prior to implementation of the revised SCS route structure.

2.10.4 After discussions in the SEACG/11 and ATS/AIS/SAR SG/12:

- An acceptable solution is close to being achieved for the Hong Kong Jakarta city pair,
- The proposed solution by SEACG/11 for the routing out of Kota Kinabalu to Phuket and the Middle East was reported to the ATS/AIS/SAR SG as unacceptable to the airlines flying this routing.

2.10.5 The implementation of A202 between Bangkok and Hong Kong gives a new level of efficiency between Bangkok and Hong Kong. Airline feedback indicates the following improvements:

City Pair	Flight time	ATC Delay
HKG-BKK	-5	-1
BKK-HKG	-6	-2

- 2.10.6 However, there are two areas where service on A202 could be improve.
 - Firstly, flights should be able to file to destinations beyond Hong Kong. This would include all the Pearl River Delta destinations that could be easily accommodated by SIDs/STARs that feed from A202. Then other Chinese destinations should be considered.
 - The other issue on A202 is the portion that requires a Chinese altitude assignment. It was discovered by airlines that while FL410 was many times an ideal altitude for the Bangkok to Hong Kong flights, the Chinese equivalent of 12,600 metres (41,300 feet) exceeds many of the airbus service ceiling limit of 41,000 feet.

2.10.7 **CONCLUSION**: APANPIRG should note the airlines report of the new level of efficiency and capacity to the major traffic flows in the South China Sea. However, APANPIRG should also note that the new South China Sea route structure is not without its flaws and there are some severe penalties to some operations, and States are urgently requested to find options that will at least provide a pre-November 2001 level of service.

2.11 Wish List for the Next Year

2.11.1 Considering the health of the industry, the existing capabilities of aircraft, the airline commitment to a FANS CNS/ATM system that can produce significant cost and safety benefits, the international air carriers would like APANPIRG to understand the needs and requirements that would allow:

- a) Greater expansion of utilising existing aircraft capabilities
 - States should implement to the extent possible, RNAV routes,
 - RNAV should be considered for procedures in the TMA,
 - Greater attention be given to designing procedures that follow FMS logic, and
 - Greater consideration be given to 3D RNAV/FMS designed procedures in the TMA which will greatly enhance the efficiency of aircraft and mitigate noise problems that are experienced by communities near airports
- b) A Rational <u>Implementation</u> Plan for CNS/ATM needs to be developed that will include:
 - A Solid ADS-B Plan,
 - Reduction of old ground based navigation aids that have outlived their usefulness, such as NDB's and primary radars,
 - Airspace initiatives that would take advantage of FANS safety and economic benefits,
 - ADS (B&C) and CPDLC Trials, followed by implementation,
 - Implementation of RNP-4,
 - Greater use of GNSS, starting with (GPS) Non-Procedure Approaches in lieu of NDB's

3. ACTION BY APANPIRG/13

3.1 To note the health of the airline industry and to consider the current airspace user requirements of the international air carriers presented in this paper when planning next year's programmes for Asia Pacific.
